

# **DIY ACCIDENT INVESTIGATION**

NEW

EDITION

2023

# **STAN BEZUIDENHOUT**





## **DIY ACCIDENT INVESTIGTION**

## **FREE EBOOK**

ΒY

## **STAN BEZUIDENHOUT**

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## **INTRODUCTION**

#### **First things first**

This e-book has been authored by Stanley Bezuidenhout, a professional with a vast amount of experience from investigating thousands of scenes and appearing in hundreds of courts of all levels. Utilizing his extensive experience, Bezuidenhout has distilled the most significant aspects of at-scene crash investigation into this condensed work, for the benefit of the reader.

The primary objective of this e-book is to equip any person who may investigate a collision with the knowledge and skills required to perform a thorough and proper investigation. Over the years, Bezuidenhout has provided training to thousands of police, fire, traffic, and ambulance personnel, as well as corporate and private clients, on the correct methods of at-scene and post-event collision investigation.

However, not everyone can afford to take time off work or incur the cost of personal training. To address this issue, this e-book has been written to enable anyone, from novice road users to professionals such as fleet owners and law enforcement officers, to gather crucial evidence at crash scenes.

It is important to note that while this e-book is designed to educate, inform, and guide, it cannot replace the benefits of experience or formal education. Nevertheless, by reading the entire e-book, readers can significantly improve their ability to protect themselves, investigate their own or a colleague's collision, or collect evidence that can assist with a court case or insurance claim.

It is recommended that readers be intentional in their efforts to read the e-book fully, as it may prove to be invaluable in reducing their liability or preventing significant inconvenience in the future. While some may find the task of reading the entire e-book daunting, the potential benefits of doing so cannot be overstated.



For individuals seeking a more structured and comprehensive approach to learning, as well as those interested in pursuing a career in Crash Investigation, IBF Investigations offers an online training series based on the content covered in this e-book, and much more. The training is designed to guide candidates through a series of modules, covering similar topics to this e-book, to ensure a thorough understanding of all aspects of Crash Investigation.

By participating in the online training, candidates will have the opportunity to cement the knowledge Get certified in at-scene Road Traffic Collision Investigation – visit <u>https://bit.ly/ibfprotocol</u> presented in the e-book and ultimately attain certification in Crash Investigation. The training program is the most effective way to build on the knowledge provided in the e-book and advance one's proficiency in the field.

To fully benefit from the e-book and the online training, interested individuals are encouraged to enroll in the courses offered through the UDEMY international inline tuition service. Details of the course is available at the following URL: <u>https://www.udemy.com/course/theibfprotocol/</u>

Over time, Stanley Bezuidenhout's reputation as a skilled trainer in Crash Investigation grew, and he began to offer courses throughout South Africa and internationally. As the quality of his IBF training and the practical nature of his courses became recognized, he started attracting international students from countries as distant as Malaysia, the Middle East, and the United States. As attendance at his courses increased, he began to receive regular requests for additional training, more detailed courses, and instruction in more advanced subjects.

While some individuals are inclined to read and appreciate physical books, others may find it difficult to carve out the time or to fully absorb the content of written works. Recognizing this, Stanley sought to develop a hybrid solution to support his candidates. He began providing attendees at his courses with a copy of DIY Accident Investigation (2nd edition), published via LuLu, to facilitate deeper appreciation and internalization of the methods and processes utilized in the field, specifically at real crash scenes.

While the book is an option for those unable to attend his courses, Stanley understood that many individuals missed out on practical training opportunities for understandable reasons.

As a training provider committed to delivering high-quality education to individuals and organizations seeking to enhance their knowledge of collision investigation, we recognize that many potential delegates and clients face various challenges that make attending practical courses difficult. The reasons commonly cited by individuals who are unable to attend include the direct cost of longer courses, the expenses associated with transport, accommodation, meals, and car rental, demanding work schedules, inability to take leave, other commitments, shortage of stand-in staff, unsuitable schedules, and loss of income during attendance.

While cost is a factor, we have found that issues related to scheduling and operational pressures are more prevalent. However, even for those who can afford to attend, the cost of practical courses can be affected by factors beyond our control, such as attendee numbers and support.

To address these challenges and make our training accessible to a wider audience, we have decided to offer this manual as an e-book, which can be purchased exclusively through our website. This will enable individuals and organizations to access the information they need to conduct thorough collision investigations at a more affordable cost and in a format that is convenient for them.

This E-Book is essential for anyone who may be involved in or exposed to road traffic collisions, whether in a personal, official, technical, operational, or legal capacity. It provides an excellent foundation for those who need to prepare reports, make claims, or defend themselves against claims, contribute to criminal or civil trials, cross-examine witnesses, or consider evidence.

The E-Book can benefit a wide range of professionals, including police officers, medical and rescue workers, insurance loss adjusters, crash reconstruction specialists, collision investigators, internal investigators, transport executives, private investigators, depot and fleet managers, safety officers, prosecutors and district attorneys, magistrates and judges, attorneys, and advocates. While it is understandable to simply download the E-Book and leave it on a hard drive, it is important to keep in mind that you never know when you may need it. The risk of being involved in a collision is high, and having familiarity with the layout and content of this E-Book can greatly benefit anyone who finds themselves in such a situation.

To ensure the maximum benefit from the E-Book, it is recommended that readers make the time to read it from beginning to end at least once a year. The guide has been designed to be concise and to the point, making it easy to read and understand.

It is suggested that readers carry a copy of the E-Book with them, either on their phone or in printed form, and read it at every opportunity until they have completed it. It should then be kept close at hand, such as in a vehicle glove compartment or briefcase.

This E-Book is something that is better to have read and not need, than to need and not have read. Even professionals who may already be experienced in crash investigations can benefit from following the steps outlined in this guide.

Fleet managers, in particular, can benefit from this E-Book as they are likely aware of the risks associated with the transport industry. By using the information provided in this guide, they can better manage and mitigate some of these risks.

#### Why investigate?



In the aftermath of collisions, individuals often prioritize their own safety and well-being, resulting in a narrow focus on their losses and injuries. However, this limited perspective can be detrimental if legal action is necessary, such as defending against claims, criminal charges, or insurance disputes. In such cases, objective and comprehensive evidence collection is critical, and this E-Book aims to provide guidance in this area.

Without proper guidelines, individuals may be unsure of how to gather evidence, what their rights are, or what evidence would be relevant in court. Additionally, it is not just one's own interests that may be at stake, as family members, colleagues, or even strangers could be impacted by the aftermath of a collision.

To effectively collect evidence, it is important to remain objective and follow external protocols. This includes not only photographing and recording one's own vehicle but also focusing on the other vehicles involved in the collision, as they may not be under one's control or accessible in the future. Details such as the position and orientation of vehicles, vehicle ownership, and where the vehicles are taken are also crucial to document.

In conclusion, proper evidence collection is essential for protecting oneself and others in the aftermath of a collision, and this E-Book serves to provide valuable guidance in this area. By remaining objective and comprehensive in evidence collection, individuals can better defend themselves against claims, criminal charges, or insurance disputes.



IBF Investigations is a specialized forensic crime, crash, and fire analysis service that provides comprehensive investigation, mapping, 3D modeling, analysis, court testimony, and training services. With over 20 years of experience serving clients in South Africa, most of the SADC region, the Middle East, Canada, and the USA, we are at the forefront of the industry.

Whether you are the accused or representing the accused, the plaintiff or defendant in a civil matter, their legal representative, the claimant in a Road Accident Fund claim, or require an investigation or analysis in an insurance claim or repudiation, we are here to assist you.

Stan has extensive experience in criminal and civil matters, road accident fund, and insurance matters and he has provided expert testimony in courts at all levels. He is are widely recognized and frequently featured in the media as a leading resource in our fields of expertise.

To reach us, please visit our website at <u>www.ibfusa.info</u>, send an email to <u>mailto</u>: <u>ibfinvestigations@gmail.com</u>, or contact us during office hours at +27 63 891-8200.

We look forward to working with you.

## **SECTION 1 – EQUIPMENT**

When investigating a crash, many people mistakenly believe that they need expensive forensic tools such as cameras, swabs, and scientific gear to properly gather and record information. However, this is only true in Hollywood movies. A well-trained investigator with a basic set of tools can effectively gather and record information.

When conducting your own investigation, it is essential to focus on the position and orientation of vehicles and other elements at the scene, as well as details about each vehicle and their owners. Knowing your rights and how to protect yourself is also crucial, especially if you are arrested.

The necessary equipment for information gathering and recording depends on the extent to which the collision is to be investigated. For basic investigations, a digital camera, GPS device, and cell phone with high-quality recording capabilities are often sufficient.

However, for more detailed investigations, certain essential tools and supplies are necessary. These include a pencil and paper for notes, measuring tapes, evidence markers, and traffic cones. These tools will help ensure that the investigation is thorough and accurate, and that evidence is not contaminated.

While this book does not make you a crash reconstructionist, it provides important information on how to manage a crash scene and collect pertinent information for use in trial assistance or case management. By following the guidelines and using the proper tools, anyone can conduct a thorough and effective crash investigation.

#### **Bag, Case or Container**



It is imperative to maintain a well-organized and tidy workspace, especially when it comes to the tools of your trade. Disorganized storage of tools and equipment in your vehicle can lead to unnecessary delays when you need to locate specific items quickly. Furthermore, it can increase the likelihood of misplacing or losing essential items, forgetting to replenish consumables, allowing batteries to deplete, or failing to charge tools.

An untidy and cluttered workspace can have disastrous consequences, particularly when working with evidence. Searching for the right tool or equipment can be time-consuming and can result in lost evidence, leading to potential negative outcomes. Moreover, working without the necessary tools due to the inability to locate them can compromise the quality of your work.

To avoid such challenges, it is recommended to keep all your equipment in a single case or bag to facilitate easy access and mobility. The size and design of your container will depend on the nature of your work and the type of vehicle you use. If you often change vehicles, you need to ensure that the container is easy to move.

It is important to note that budget constraints may impact your choice of equipment, and it is crucial to consider the value of the items being purchased. Expensive tools or equipment should be insured against loss, as the nature of your work may require you to leave your container unattended.

By adopting a well-organized and thoughtful approach to storing your tools and equipment, you can save time, prevent delays, and reduce the likelihood of losing items or compromising your work.

#### **Reflective Jacket**



In order to ensure your safety and minimize the risk of exposure to danger, it is strongly advised that you possess a reflective jacket when working or present at a scene where visibility may be compromised, particularly during the night. Failing to wear a highly visible and reflective jacket can put you at risk of being involved in a secondary collision, a hazard that even emergency service workers have fallen prey to in the past. Therefore, it is recommended that you consider purchasing a reflective jacket with your name and/or company's name on it, if feasible. By doing so, you will increase your chances of being identified, gaining the respect of emergency service workers, and being noticed in case you suffer a fall or collision.

The moth effect is a term used to describe how drivers are drawn to bright lights, such as the flashing red lights of emergency vehicles on the side of the road. While it is natural for motorists to be curious about a scene on the side of the road, fixating on the lights at night can be dangerous and result in distracted driving. It is harder to process visual information at night, which can lead to misjudging distance and speed, and cause drivers to lose track of their own lane position. Consequently, it is important to wear a reflective jacket that catches the eye and helps to ensure that you remain visible

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and identifiable to others. In the case of a crash scene, this can help prevent injury and even save lives.

Today, researchers look at their effects on motorists.

In 2008, a study was conducted by the University of Michigan Transportation Research Institute to investigate the impact of warning lamp color and intensity on driver vision. The study assessed various variables, including light color and intensity, and participants were required to differentiate whether flashing lights were located on the right or left side of an emergency vehicle and whether emergency responders were positioned on the right or left side of the vehicle as quickly as possible. The results indicated that participants were better able to distinguish the lights at night and the pedestrians during the day. Additionally, the addition of color to the equation demonstrated that blue markings were the most easily distinguishable, followed by yellow, red, and white.

Based on these findings, researchers suggested that emergency vehicles be equipped with blue lights, as is the norm in Europe. Furthermore, they proposed that the use of blue lights may prevent the "moth effect," in which drivers mistake red lights for vehicle taillights and follow them off the road and into emergency personnel. According to FBI data, between 2001 and 2010, 44 police officers were struck by vehicles and killed while directing traffic or assisting motorists, and 74 were killed while executing traffic stops or roadblocks. In 2010 alone, 11 police officers were killed, the most recent year recorded. Moreover, the annual Firefighter Fatality Report by the National Institute for Occupational Safety and Health shows that three firefighters were killed in 2011, and the numbers are even higher for construction workers.

According to the Bureau of Labor Statistics, 268 workers were killed in 2009 and 277 in 2010, accounting for 6 percent of all fatal occupational injuries during those two years. However, the data provided does not differentiate between day and night events, so it is unclear whether driver inattentiveness was solely due to the "moth effect" or other factors. Despite the popularity of the "moth effect" term, Martin Pietrucha, a Penn State civil and environmental engineering professor and director of the Thomas D. Larson Pennsylvania Transportation Institute, notes that it has not been scientifically proven. Pietrucha has conducted studies that compared the use of emergency lights at accidents versus no lights, with mixed results.

Pietrucha believes that the problem is multifaceted and cites the optical illusion at night as a major contributing factor. Since there are no other visual cues, drivers' depth perception is off, making it more difficult for them to perceive the placement and speed of vehicles on the shoulder. Additionally, fatigue or impairment due to drugs or alcohol can also contribute to lane drift and other driving errors.

Jack Sullivan, director of training for the Cumberland Valley (Va.) Volunteer Firemen's Association's Emergency Responder Safety Institute, agrees that the "moth effect" is a real phenomenon, but prefers to call it "distracted driving." He notes that crashes can occur due to drivers' innate curiosity or distractions, as opposed to being solely caused by emergency lights.

Experts like Pietrucha and Sullivan are working to explore ways to make roads safer for emergency personnel, including studying proper positioning of response vehicles and temporary traffic control systems.

There are several considerations regarding the safety of emergency responders working on the roadside. These include the placement of emergency vehicles in relation to traffic, the distance of cones and other barriers from the crash or work zone, the type of lighting used, standardization of lighting and vehicle colors, and the standardization of reflective patterns.

To address these concerns, the U.S. Fire Administration has partnered with the Emergency Responder Safety Institute to develop respondersafety.com. This website serves as a comprehensive resource for Get certified in at-scene Road Traffic Collision Investigation – visit <u>https://bit.ly/ibfprotocol</u> emergency personnel, providing training, news, and information on incidents of on-duty responders injured or killed by vehicles.

Jack Sullivan, a leading expert in emergency responder safety, has been advocating for increased awareness of distracted driving for over a decade. He stresses the importance of wearing reflective jackets, which are not only a requirement by law, but can also be a life-saving measure for emergency personnel.

As an investigator, it is important to recognize that a collision scene can be considered a workplace, and all reasonable steps should be taken to safeguard oneself against risk or injury. Therefore, wearing reflective clothing is essential when working on the roadside, whether during the day or at night.

#### **Flash Light**



Having a high-quality flashlight readily available can be a valuable asset, particularly when attending to situations after dark. It is highly recommended that individuals maintain possession of a flashlight either within their vehicle or on their person at all times.

When selecting a suitable flashlight, it is important to ensure that it is designed to offer a range of essential benefits. These may encompass but are not limited to:

 Portability – It is imperative to use a flashlight that does not impede your mobility or ability to navigate effectively, particularly in low-light conditions or on uneven terrain. Employing a flashlight that is excessively large, heavy, or cumbersome may prove to be a hindrance to your movement.

Opting for a relatively compact flashlight or even a head-mounted light can be considered suitable alternatives that offer enhanced maneuverability and convenience.

2. Brightness – It is worth noting that your flashlight can serve multiple purposes, including facilitating visibility and aiding in the detection and photography of evidence. As such, it is essential that your flashlight possesses adequate brightness to prevent fumbling in the dark and enable proper visibility.

It is important to exercise caution, however, as some contemporary flashlight models can produce excessively bright beams that can lead to glare and discomfort for individuals in close proximity or oncoming traffic. Therefore, it is advisable to be mindful of such risks and adjust the flashlight's brightness accordingly.

3. Light Emission Pattern – Obtaining a flashlight that offers the flexibility of beam adjustment, from wide to focused, is highly recommended. Such versatility can prove to be advantageous when attempting to examine or photograph evidence, especially smaller objects such as light bulbs, as the narrow beam provides greater light focus and intensity.

Conversely, a wide beam would be preferable when endeavoring to illuminate a broader area of the scene or capture wider photographs. Therefore, having access to a flashlight that enables beam adjustment can be highly beneficial, facilitating enhanced precision and accuracy in various scenarios.

4. Light Color – It is worth noting that the light emitted from various types of light bulbs can differ in quality. Incandescent bulbs, for instance, tend to produce a slightly warmer, yellow or orange glow, which can have an impact on the overall appearance of photographs. This may lead to a potential misrepresentation of the original colors and hues.

In contrast, LED light bulbs generally offer a cooler, bluer light that is more suitable for photography. Additionally, they tend to be more energy-efficient, thereby consuming less battery life than incandescent bulbs. Consequently, selecting the appropriate type of light bulb can make a significant difference in the quality of photographs and accurate representation of colors.

5. Fire Risk – In work environments where airborne chemicals are present, it is advisable to consider utilizing a water-sealed flashlight that carries an IP 66 or 67 rating. This measure helps to eliminate the risk of internal sparking and ensures workplace safety. It is important to note that certain chemicals, such as gasoline (petrol), can become highly flammable under specific conditions, and any form of ignition, no matter how minor, could lead to disastrous outcomes.

In addition to aiding visibility in low-light settings, flashlights can serve a crucial role in illuminating evidence during night-time photography. While some cameras and cell phones are equipped with builtin flash functions, these can often prove more detrimental than beneficial in certain scenarios. For instance, when capturing an image of a license disk on a vehicle at night, the flash may cause glare or reflection on the glass surface, leading to a loss of focus and over-exposure of the object. Therefore, it is recommended to always approach license disks from an angle to avoid these issues and ensure optimal image quality.

#### **Voice Recorder or Cell Phone**



At the scene of a collision, individuals tend to display a cooperative and apologetic demeanor; however, this attitude can rapidly shift when confronted with the possibility of liability or guilt. In these circumstances, people may make contradictory statements or retract previous admissions, thus jeopardizing the accuracy and validity of any collected evidence. To mitigate these risks, it is crucial to record every conversation, interaction, and statement made at the scene, without concern for matters of privacy or eavesdropping. Such recordings can serve as valuable evidence in court proceedings and can be used to verify facts and assumptions.

When conducting legal research, the process of fact investigation remains a cornerstone of the profession, regardless of the technological advancements that have been made. Whether dealing with a civil or criminal litigation or a transactional matter, attorneys must gather and evaluate all available facts to determine the best course of action for their clients. Through comprehensive interviews and diligent fact-finding, lawyers can assess the risks and benefits of each option and provide informed guidance to their clients.

#### **Digital Camera or Cell Phone**



While most individuals have access to a camera-equipped cell phone, these devices may not be the most suitable option for crash scene investigation, particularly in low-light conditions. While a dedicated camera is the ideal choice, it is important to remember that any form of photographic evidence is better than none at all, regardless of the equipment used. Therefore, if a cell phone is the only available option, it should still be utilized to capture as much evidence as possible. With crime scene photography, it is better to have low-quality evidence than none at all, as it can still prove valuable in the investigation.

When selecting a camera for a specific application, it is important to consider various factors to ensure optimal results. The following advice, which draws from an article published on the Digital Photo Mentor website, can serve as a useful starting point for prospective camera owners:

- Identify your specific photography needs and determine the features and specifications required to meet those needs.
- Research and compare different camera models to find the best fit for your intended application.

- Consider the size, weight, and portability of the camera, particularly if you plan on carrying it with you at all times.
- Assess the ease of use and compatibility with any existing equipment or software you may have.
- Look for reviews or testimonials from other users to gain insights into the performance and reliability of the camera.

#### 8 things to consider when choosing a new camera

Prior to delving into the specifics of camera features, it is essential to recognize that this is not a typical guide outlining the factors to consider when purchasing a camera. While there may be some variations in features across different camera models, most cameras generally offer similar features. Therefore, the critical consideration is determining which camera type is best suited for your needs.

#### #1 - What do you like to photograph?

One of the primary considerations when selecting a new camera is the types of subjects you intend to photograph. In the case of forensic evidence, you may need to capture images of various items, including motor vehicles, roads, road sections, vehicle components, items behind glass, light bulbs, tire details, and even small pieces of evidence, often in poor lighting conditions or darkness. Additionally, certain pieces of evidence may be challenging to access, meaning that the camera cannot be too large.

Understanding the subjects that will be in front of your camera is essential in narrowing down your options. Generally, cameras fall into five categories:

- DSLR (with interchangeable lenses)
- Mirrorless or Four Thirds (with interchangeable lenses)
- Point and Shoot (lens is not interchangeable)
- Smartphone (you may already have one of these)

• Specialty cameras like GoPro, drones, or dedicated video cameras.

Assuming that you already possess a smartphone and are seeking an upgrade, let's revisit the list of photography subjects mentioned above, and I'll offer suggestions for the best camera to fit your needs.

#### Photography subjects and suggested cameras

It is important to note that the type of camera you choose for crash scene investigation will depend heavily on the specific subjects you will need to photograph. Some common subjects include motor vehicles, roads, road sections, vehicle components, items behind glass, light bulbs and tire details, and even very tiny pieces of evidence, all of which may need to be photographed under poor lighting conditions or in the dark. Given these requirements, it is recommended that you choose a camera that is suitable for low-light photography and is not too big to access hard-to-reach areas.

While the list of photography subjects above provides a rough guide, the ultimate decision should be based on the application rather than the budget. For crash scene investigation, it may be necessary to own multiple cameras, such as a compact camera for primary work and a larger one for night work.

#### #2 – What is your budget?

When it comes to budget considerations, it's important to remember that more advanced cameras with additional features and capabilities come with a higher price tag. However, if you're a professional or someone who frequently needs to document crash scenes, it may be worth investing in a dedicated camera.

On the other hand, if you're a member of the public who may only need to collect evidence at a crash scene occasionally, sticking with your cell phone may be the most practical choice. However, it's important to keep in mind that cell phones may have limitations in terms of battery life, memory, low light performance, and flash strength. If you do decide to use your cell phone, it's highly recommended to practice taking photos under different lighting conditions and angles. Dark metallic vehicles photographed at night, for example, may expose weaknesses in your camera's capabilities. Ultimately, it's important to have the necessary skills and equipment to properly document a crash scene and collect evidence.

#### #3 – What is your photography skill level?

As a photographer, your skill level is a key factor in determining the best digital camera for your needs. Whether you are a beginner, intermediate or advanced photographer will influence the type of camera features you require.

If you plan to use your cell phone, your specific skills may not be as important, particularly in daylight conditions. However, your photography skills will play a significant role when capturing images under adverse lighting conditions. In low-light situations, most regular phones may not perform well. Even with upmarket cameras, the results are still heavily reliant on the photographer's skills.

If you are not familiar with the manual settings on your camera, you may need to shoot on Auto mode, which limits your control over the final image. The photographer's skill level is not limited to framing the shot, as seen in model photography. Your ability to hold your camera properly, use a tripod, choose the right lighting, and angle can significantly impact your results.

#### #4 – How will you be sharing your images?

As you consider the best digital camera for your needs, you may wonder about file size and megapixels. With cameras and even cell phones boasting more and more megapixels, it's worth asking if you really need all that resolution. For instance, do you need 36 megapixels, or is that overkill for your purposes?

It's worth noting that I got my first digital camera back in 2000, a Canon Mavica MVC-CD1000 with 2.1 Megapixels. Most smartphones now have more megapixels than that. Despite this, the evidence I Get certified in at-scene Road Traffic Collision Investigation – visit <u>https://bit.ly/ibfprotocol</u> collected was adequate for the purpose of Crash Investigation.

Unless you plan on shooting stock images or printing your images larger than 60", you likely don't need the maximum number of megapixels. Instead, focus on other criteria when choosing your camera.

It's also important to note that cell phone images shared via chat services like WhatsApp or Facebook are reduced in size, heavily compressed, and stripped of all metadata necessary for presenting evidence. This includes important information like the date and time the photograph was taken, the camera used, and GPS coordinates. This information is crucial for later interpretation or analysis of evidence.

#### #5 – How big are your hands?

It is recommended that when shopping for the best digital camera, you should consider visiting an actual camera store rather than relying solely on online shopping. This is because there are a few reasons why physically going to a camera store is beneficial. Firstly, it allows you to hold the camera in your hands and get a feel for its size and ergonomics. For instance, people with big hands may find it challenging to use cameras with tiny buttons such as the Olympus. Secondly, camera stores have photography specialists who can answer any questions you may have and provide suggestions based on your needs. This personalized service is not available on a website. By holding and testing your short-listed cameras in person, you can make an informed decision on which is the best digital camera for you without the risk of purchasing a camera that is too large or uncomfortable to use. It is important to note that while online shopping has its advantages, visiting a camera store should not be overlooked when making such an important purchase.

#### #6 – Do you want the option of upgrading later?

For those seeking an entry-level camera with the option of adding components or upgrading later, the best digital camera options would be either a mirrorless or DSLR. A point-and-shoot camera with a fixed lens will not offer this flexibility. However, it's worth noting that a point-and-shoot camera can be used as a backup camera later on. Generally, mirrorless and DSLR cameras allow for upgrading with new lenses, filters, and more. So, if you want to start small and expand as you learn, these options are your best bet.

It's worth emphasizing that, unless you plan to use your cell phone exclusively, it's recommended to own two cameras: a compact camera for daily use, and a larger or more capable camera, such as a DSLR or prosumer camera, for night photography or other specific needs. Both cameras should be kept within reach, such as in an investigation bag, but it's not advisable to use both at once unless you're willing to carry more equipment than necessary.

#### #7 – Do you want more control over your images?

When it comes to Crash Investigation or evidence collection, special effects, manual adjustments, exposure manipulation, special filters, or artistic effects are typically not necessary. Unless you're facing challenging conditions like darkness or heavy precipitation, it's best to avoid messing with these control dials and menu features.

Meddling with settings, filters, and effects can result in irreversible damage to your evidence, especially if you get stuck in a mode and aren't sure how to undo it. This applies to cell phone cameras as well, as effects like "Portrait" or "Beauty" may not be suitable for presenting evidence. In general, it's best to stick to the simplest methods and basic settings, and limit the use of special filters and effects unless absolutely necessary or if you have the skill to use them properly. Crime photography is not about creating art, but about capturing accurate and reliable evidence.

#### #8 – What brand camera do most of your friends use?

It is important to note that the brand of camera you choose will have little effect on your ability to capture evidence at a crash or crime scene. While professional photographers may find it significant, it is not as crucial for forensic investigators, especially those who do not work in a team setting. Additionally, if you rely solely on your cell phone for photography, this decision will have little impact on you.

As the saying goes, "The best camera for evidence collection is the one you have with you." Therefore, it is crucial to ensure that your camera is always charged, and its memory is regularly downloaded and cleared. It is also essential to make backups of all photographs onto various mediums, such as a drive or the cloud, or carry multiple camera memory cards.

Lost data is a significant setback when presenting evidence in court, so it is crucial to take necessary precautions to avoid it.

#### **Surgical Gloves**



When working at a crash or crime scene, it is crucial to protect yourself against potential exposure to blood-borne pathogens. This is particularly important if you are dealing with injured individuals or bodily fluids. The Centers for Disease Control (CDC) provides guidelines and recommendations for preventing exposure to blood-borne pathogens, such as hepatitis B, hepatitis C, and human immunodeficiency virus (HIV). In addition to wearing surgical gloves, you should also wear other personal protective equipment (PPE), such as eye protection and a face mask, as appropriate. Proper disposal of contaminated materials and equipment is also essential to prevent the spread of infection. Remember, protecting yourself not only safeguards your health but also ensures that you can continue to work effectively as an evidence collector or crash investigator.

#### Bloodborne pathogens and workplace sharps injuries

Human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) are among the most prevalent bloodborne pathogens that pose a significant risk to healthcare workers. These diseases can be contracted through either a percutaneous injury caused by a sharp object or contact with mucous membranes or non-intact skin exposed to blood, tissue, or other potentially infectious bodily fluids.

In the event of exposure to a bloodborne pathogen, immediate action is necessary to minimize the risk of infection. It is essential to wash the affected area thoroughly with soap and water, and if the eye is exposed, irrigate with clean water, saline, or a sterile fluid.

Promptly reporting the exposure to a supervisor is crucial. Seeking medical attention is also necessary to receive appropriate treatment, including laboratory tests, vaccinations, or medications as necessary.

It is vital to prioritize personal safety when dealing with bloodborne pathogens. The risk of exposure should not be taken lightly under any circumstances.
## Human immunodeficiency virus (HIV)

Human immunodeficiency virus (HIV) is a viral infection that impairs the immune system's ability to combat infections. Immunocompromised individuals can experience a range of symptoms, including weight loss, persistent low-grade fever, night sweats, and flu-like symptoms, and are more susceptible to pneumonia, intestinal disorders, and fungal infections.

The risk of HIV transmission through a sharps injury is estimated to be approximately 0.3 percent (1 in 300). According to the Centers for Disease Control and Prevention (CDC), there have been 57 confirmed cases and 140 potential cases of HIV transmission to healthcare workers in the United States between 1981 and December 2006.

Of the 57 confirmed cases, 48 were linked to percutaneous injury (i.e., puncture or cut injury), with a significant proportion of cases involving nurses and laboratory technicians. However, some experts suggest that the number of occupationally acquired infections may be much higher than reported.

Healthcare workers must take appropriate measures to protect themselves from occupational exposure to bloodborne pathogens like HIV to ensure their own safety and the safety of their patients.

# Hepatitis B virus (HBV)

Hepatitis B virus (HBV) can result in severe liver damage and fatality. Symptoms of HBV infection include jaundice, fever, nausea, and abdominal pain. Roughly 5 to 10 percent of individuals with HBV develop chronic infection, which poses a 20 percent lifetime risk of cirrhosis-related death and a 6 percent risk of liver cancer-related death. The estimated likelihood of contracting HBV through a sharps injury ranges between 6 and 30 percent.

In 2001, about 400 healthcare workers contracted HBV based on national hepatitis surveillance data. This represents a 95 percent decrease from the estimated 17,000 new infections in 1983. The reduction is largely attributed to the widespread administration of hepatitis B vaccines to healthcare workers and the implementation of universal precautions and other measures mandated by the Occupational Safety and Health Administration (OSHA).

# Hepatitis C virus (HCV)

Hepatitis C virus (HCV) can lead to severe liver damage and mortality. Infection may present with no symptoms or only mild ones. Chronic hepatitis occurs in 75 to 80 percent of HCV-positive individuals, of whom 70 percent experience active liver disease. Among those with active liver disease, 10 to 20 percent develop cirrhosis, and 1 to 5 percent develop liver cancer.

Although the prevalence of HCV infection among health care workers is comparable to that of the general population (1% to 2%), health care workers have an elevated occupational risk of HCV infection. The Centers for Disease Control and Prevention (CDC) reports that the average chance of infection following exposure to infected blood via a needlestick or cut is approximately 1.8 percent.

While recent research indicates a connection between sharps injuries and HCV infection, the number of healthcare workers who acquired HCV occupationally remains unknown. Nonetheless, of the total yearly cases of acute HCV infections, which ranged from 100,000 in 1991 to 36,000 in 1996, 2% to 4% were healthcare workers exposed to blood in the workplace.

# **Working Gloves**



As per a report by www.ohsonline.com, recent studies conducted by two sheet metal manufacturers have found that the cost of a single hand injury requiring stitches falls in the range of \$22,000 to \$30,000. These cost estimates take into account various factors such as shutting down the assembly line to remove the injured worker, cleaning the affected area, ambulance transportation, medical expenses, and rehabilitation costs. Therefore, preventing hand and arm injuries with the use of cut-resistant gloves and sleeves can prove to be a highly cost-effective measure.

There are two main types of cut hazards to be aware of. The first type is clean, sharp edge cuts, which can result from knives and clean edge sheet glass. The second type is abrasive cut hazards, which may arise from rough edge sheet metal, stamped or punched sheet metal, and rough-edged sheet glass.

# **Clean Sharp Edge Hazards**

The Occupational Health and Safety industry uses the Cut Protection Performance Test (CPPT) on ASTM Standard F1790-97 to measure cut resistance for clean sharp edges. The CPPT measures the weight (in grams) required to cut through a glove on a 25-millimeter pass using a razor-sharp blade. To make cut-resistant gloves for this type of hazard, the industry designs the following factors into the yarns used to knit gloves: tensile strength, abrasive action, and slippage. Stainless steel provides tensile strength, a glass core provides abrasive action, and certain monofilament fibers offer slippage advantages.

Gloves designed to resist clean edge cuts typically incorporate core yarns. These are manufactured by wrapping different yarns around a center or solid fiber core, with each wrap providing a factor of cut resistance. When evaluating cut-resistant gloves, the user should ask for the CPPT rating, fiber composition, and the factor of cut resistance each yarn provides. For example, a glove with abrasive action and slippage might not provide enough tensile strength to handle sharp edges that require prying.

Core yarns are expensive to make because each wrap requires a pass through the machine, and most yarns have multiple wraps. The weight or thickness of this type of glove should not be taken as an indication of cut resistance. The outer wraps of core yarns are usually made of some form of polyester, which can make the yarn appear stronger without adding any appreciable protection against cuts. The CPPT rating provides an accurate measurement for cut resistance. Due to their high cost, these gloves are primarily used as liners in industrial, food, or laboratory applications, with the cover gloves providing the necessary wear capabilities.

It is crucial to note that these gloves cannot protect against moving or rotating blades or serrated edges.

# Abrasive Cut Hazards

Currently, no standard test exists to measure abrasive cut resistance in gloves. Although the ASTM F1790-97 standard is often used as a reference point, it should be noted that this standard tests with a razor-sharp blade and may not accurately reflect the protection needed for abrasive cut hazards, which not only cut but also tear and abrade. Gloves used in these applications must provide cut resistance, abrasion resistance, and tensile strength. They are typically thicker than gloves used for clean edge cuts and are worn in direct contact with the hazard rather than as a liner.

To provide protection against abrasive cut hazards, gloves are designed with specific factors in mind, such as stretch, rolling, and loft. Stretch allows the glove to move ahead of the cutting edge, while rolling of the yarn fibers helps to prevent the hazard from penetrating the glove. Loft, or a soft thickness in the glove, provides additional resistance to the cutting edge.

When evaluating gloves for abrasive cut hazards, it is important to categorize them based on the physical application. Some examples include grinding, sanding, and cutting with rough edge sheet metal. Each of these applications requires a different type of glove that provides the necessary protection against the specific hazards involved.

# Edge sharpness

While it is true that all edges can be sharp, it is important to assess the level of hazard in order to reduce costs associated with both procurement and the occurrence of cut incidents. The availability of different types of cut-resistant fibers allows for an evaluation of the cost and level of protection provided by each option. Through this assessment, it is possible to make informed decisions that balance cost considerations with the need for adequate protection against the risk of cuts.

# **Edge roughness**

In the realm of cut-resistant gloves, it is important to consider the gauge of the sheet metal being handled. Thin gauge sheet metal typically produces a smaller burr when stamped or punched as compared to thicker gauge sheet metal. As a result, thinner gloves may be sufficient for handling the former, while thicker or heavier-weight gloves are required for rougher edges. These heavier gloves provide greater protection by preventing the burr from penetrating the glove and cutting the hand. In order to increase durability and longevity when dealing with rough edges, gloves made from yarns with higher tensile strength and enhanced abrasion resistance are necessary.

# Surface texture

When it comes to selecting gloves for different surfaces, it is important to consider the grip required. For dry surfaces, gloves with grip are needed to prevent slipping. On the other hand, oily surfaces require gloves with absorption to enable a good grip. To enhance the grip of cut-resistant gloves, different techniques can be used such as dipping, dotting, or screening. These methods add grip to the gloves and can be tailored to meet specific needs. It is important to consider the nature of the surface when selecting gloves to ensure the correct type of grip is provided.

#### Puncture

When dealing with puncture hazards, it is important to note that while they can cause lacerations, the initial protection needed is puncture resistance, rather than cut resistance. The hand can become cut because the barb or shard is able to penetrate the surface of the glove. In order to mitigate this risk, a coating or leather patch can be added to the surface of the glove, which can help prevent shards from penetrating the glove.

# Moving edges versus stationary edges

When dealing with moving edges, thicker gloves are required as the edge tears the glove surface as it passes along the palm. Thicker gloves provide more wear resistance in this case. However, for stationary edges, less reinforcement is required. It is important to note that the moving edge referenced here occurs when a hand slides along a piece of metal or glass as it is grabbed. It is worth mentioning that no glove can provide complete protection against a moving or rotating blade.

# Assembly

Hand-cut injuries frequently arise in sheet metal assembly areas, where automatic wrenches and screwdrivers are used to drive moving parts such as nuts, bolts, and screws. In such situations, it is generally advisable to avoid using knit gloves since they can get caught on the edge of a turning screw or bolt while being driven. Gloves with a tacky grip may also present similar risks. Instead, gloves made with cut-resistant fibers can be used, and they can be dipped in coatings that encapsulate the knit fibers, providing a dry, wet, and oily surface grip without becoming tacky.

## **Useful Terms to Know**

Cut-resistant gloves come in various designs, but most of them are made using a knitting process. Below are some terms that can help explain how these gloves are constructed.

**Gauge.** In the context of knit gloves, the term "gauge" refers to the weight or thickness of the glove. It is technically defined as the measure of the number of wales (vertical knit lines) per horizontal inch. For instance, 7 gauge means that there are 7 wales per horizontal inch, which allows the knitter to use a thicker yarn to create a heavier glove. Cut-resistant gloves come in 7, 10, and 13-gauge weights, with 7 being the heaviest.

**Plating (or plaiting).** In the knitting process of gloves, plating refers to the technique of knitting two gloves together at the same time. This allows for the outer glove to be made with a different type of yarn than the inner glove, providing additional features such as cut and abrasion resistance. Plating also makes the glove thicker, which is a beneficial design feature when dealing with punched or stamped sheet metal.

**Terry cloth.** The term "terrycloth" refers to gloves that are knit with a loop structure aligned along the width of the glove, so that any edge cuts along the length of the yarn. This loop structure provides a cut-resistant design feature, as cutting along the length of the yarn is much more difficult than simply cutting a string in half. In addition, the loop structure offers a soft, cushioning effect that enhances the cut resistance of the gloves.

When examining a vehicle, it is important to take precautions to protect yourself from potential hazards such as cuts or punctures. Moving broken windshields, opening doors, and lifting damaged panels can all pose a risk. Additionally, bodily fluids and pathogens may be present in the vehicle, making it important to avoid interacting with anything sharp, hard, or heavy without proper protection.

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While it is crucial to avoid contaminating a crime scene, certain forms of contamination may be acceptable under specific conditions. For example, removing a license disk from behind a broken windshield or retrieving identification from a damaged glove compartment may be necessary for the investigation. However, it is important to always document any actions taken by taking "before and after" photos to preserve the chain of evidence.

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# **Eye Protection**



The American Optometric Association emphasizes the importance of eye protection in the workplace, particularly in the context of crash scenes. According to the National Institute for Occupational Safety and Health (NIOSH), approximately 2,000 workers in the United States sustain job-related eye injuries that require medical treatment on a daily basis. However, safety experts and eye doctors agree that proper eye protection can prevent or reduce the severity of up to 90 percent of these injuries.

Common workplace eye injuries include foreign objects or chemicals in the eye, cuts or scrapes on the cornea, burns from steam, and exposure to ultraviolet or infrared radiation or flying wood or metal chips. Workers in healthcare, laboratory, janitorial, and other fields may also be at risk of acquiring infectious diseases through eye exposure. Direct exposure to blood splashes, respiratory droplets, or contaminated objects can transmit infectious diseases through the mucous membranes of the eye.

There are two main reasons why workers experience eye injuries on the job: either they were not wearing appropriate eye protection, or they were wearing improper or ill-fitting protection. Employers have a responsibility to ensure that workers are provided with appropriate eye protection and are trained in its proper use.

According to a survey conducted by the Bureau of Labor Statistics, nearly three out of five workers who suffered eye injuries were not wearing eye protection at the time of the accident. Such workers often believed that eye protection was unnecessary for the situation. However, the Occupational Safety and Health Administration (OSHA) mandates the use of eye and face protection whenever there is a reasonable probability of injury that could be prevented by such equipment.

Personal protective eyewear, such as safety glasses, goggles, face shields, or full-face respirators, must be used when an eye hazard exists. The appropriate eye protection depends on the type of hazard, exposure circumstances, other protective equipment used, and individual vision needs. Workplace eye protection is necessary when potential eye hazards, such as projectiles, chemicals, radiation, and bloodborne pathogens, are present. Some working conditions may involve multiple eye hazards, and proper eye protection must take all hazards into account.

To determine the type of safety eye protection required, workers should assess the hazards present in their workplace. For instance, if they are working in an area with particles, flying objects, or dust, they must wear safety glasses with side protection (side shields). If they are working with chemicals, they should wear goggles. And if they are working near hazardous radiation, such as welding, lasers, or fiber optics, they must use special-purpose safety glasses, goggles, face shields, or helmets designed for that task. It is crucial to know the eye safety dangers in one's work environment and eliminate hazards before starting work by using machine guards, work screens, or other engineering controls. Workers must use proper eye protection and keep their safety eyewear in good condition, replacing it if it becomes damaged. Selection of protective eyewear appropriate for a given task should be made based on a hazard assessment of each activity.

Nonprescription and prescription safety glasses, which are much stronger than regular eyeglasses, provide eye protection for general working conditions where there may be dust, chips, or flying particles. Side shields and wraparound-style safety glasses can provide additional side protection. Goggles, on the other hand, provide protection from impact, dust, and chemical splash, and can be worn over prescription glasses and contact lenses.

Safety glasses and goggles must fit properly to provide adequate protection, and eye protection devices must be properly maintained. Scratched and dirty devices reduce vision, cause glare, and may contribute to accidents. In the US, safety glasses must meet the standards of the American National Standards Institute (ANSI), and workers should look for the Z87 mark on the lens or frame. Similarly, in South Africa, workers should look for the SABS Mark to ensure the safety glasses meet the necessary standards.

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## **Face Mask**



As stated on the website of the US Food and Drug Administration (FDA), a facemask is a disposable device that creates a physical barrier between the wearer's mouth and nose and potential contaminants in the immediate environment. Facemasks come in different types, such as surgical, isolation, dental, or medical procedure masks, and may be equipped with or without a face shield. The thickness and protective abilities of facemasks may vary, affecting both breathability and protective efficacy.

When worn properly, facemasks can help prevent large-particle droplets, splashes, sprays, or splatter that may contain germs from reaching the wearer's mouth and nose. They may also reduce exposure of the wearer's saliva and respiratory secretions to others. However, facemasks are not designed to filter or block very small particles in the air, such as those transmitted by coughs, sneezes, or certain medical procedures. Moreover, facemasks do not offer complete protection from germs and other contaminants due to the loose fit between the mask's surface and the wearer's face. Facemasks should not be shared and must be disposed of after a single use. Damaged or soiled masks or those that make breathing difficult should be removed safely and replaced with a new one. Used masks should be placed in a plastic bag and disposed of in the trash. Hands must be washed after handling used masks.

When dealing with a burned vehicle that may release harmful particles or chemicals, it is advisable to wear a protective mask that is specifically designed to filter out such substances. Relying on makeshift masks such as shirts or T-shirts may not offer adequate protection and could expose the wearer to respiratory distress and long-term injuries. While the appearance of wearing a respiratory protection mask may seem silly, the potential dangers of inhaling chemical emissions and particle clouds can be very serious and may require emergency services to divert their attention from providing critical care to others.

In conclusion, it is crucial to take all possible precautions to protect oneself from injury or distress, especially when dealing with potentially hazardous situations. Ignoring the risks could distract emergency services from providing timely care to those who need it the most.

# **Measuring Tools**



To conduct a thorough on-site investigation, certain measurements must be taken to ensure accuracy and precision. The length of skid marks, distance between parallel skid marks (track width), and height of damage are among the most critical measurements to obtain. The length of skid marks can be measured with a measuring wheel or a tape measure that is at least 10m (30ft) in length. It is recommended to use a measuring tape for basic measurements, such as skid-line length, to ensure exact measurements rather than relying on guesswork or improvisation. Pacing, a method commonly used by police officers, is highly subjective and often leads to misinterpretation. To increase reliability and accuracy, it is recommended to use a tape measure and measuring wheel if available. These tools provide more precise measurements and can be particularly helpful in court or during later reference if the scene is visited during a trial.

# <image>

**Marking Spray** 

In accordance with South African law, it is important to note that no vehicle involved in a collision may be moved unless its position is clearly marked. To mark the position of the vehicle, various methods may be used. However, it is essential to consider the color of the spray used for marking. It is recommended to avoid using bright or luminous colors as they may leave unsightly marks on the road and could be distracting to other road users. Instead, silver or chrome spray is recommended as it is more effective without leaving bright marks on the roadway. Additionally, it is advisable to have a second color available, such as yellow or white, if you plan on using marking spray.

In contrast to the limited options available in South Africa, consumers in the United States have access to specialized powdered spray cans that can be used inverted, making marking of crime scenes much more effective and efficient. While these options may be more costly than off-the-shelf aerosol spraypaint varieties, they are specifically designed for the purpose and work much better.

It is important to note that when marking evidence at a scene, it is recommended to mark either everything or nothing, unless you can use two different colors to clearly confirm which marks you made.

It is also advisable to use one color for the marks you make and have another color handy for others to use if necessary. This protects you from allegations of poor work and helps confirm what you marked and what other people may have marked. It is essential to check the rules or laws in your state or country regarding the marking of evidence at a scene.

# **DRAWING TOOLS**



The IPTM Traffic Template is a specialized instrument designed to meet the needs of traffic crash investigators in creating field sketches, scale diagrams, and maps of traffic crash scenes. However, this tool can also be useful to professionals such as engineers, architects, attorneys, insurance investigators, claims adjusters, and others who need to prepare sketches and diagrams of traffic-related scenes.

Constructed with edges, corners, cutouts, and scales, the IPTM Traffic Template allows for quick and accurate drawing of standard size motor vehicles, trailers, motorcycles, pedestrians, and commonly used arcs, curves, and circles. Additionally, the template includes a nomograph, which provides scales for distance in meters, speed in kilometers per hour, velocity in meters per second, drag factor, and deceleration rate in meters per second squared. This feature makes it easy to determine any of these variables from relevant known data.

The template is also equipped with a clinometer scale, which, when used with a specially prepared clipboard, allows investigators to measure the grade or super-elevation of a roadway with reasonable

accuracy. The cutouts on the template are constructed to allow for the width of pencil and pen points, and a thin, sharp point should always be used for drawing. Mechanical pencils with a 0.5 mm point are recommended to fit into the small holes in the template.

If the template lacks a cutout of a vehicle, body, or other item of evidence that must be drawn to scale, straightedge measurements should be used for the drawing. Similarly, if an arc must be drawn to a scale not provided on the template, a compass should be used.

The top left corner of the IPTM Traffic Template features a protractor graduated in degrees from o - 90, which can be used to draw 45 and 90-degree angles. A guide hole along the baseline and the 45-degree line, as well as a slot along the 90-degree line, can be used in conjunction with the vertex to achieve this.

Overall, the IPTM Traffic Template is a versatile and valuable tool for professionals who need to create accurate and detailed diagrams of traffic-related scenes.

The elements utilized in drawing arcs, curves, and circles of specific radii, along with vehicles, pedestrians, and straightedges, are prepared in two scales:

- 1 cm = 1 m, also denoted as 1:100
- 1 cm = 2 m, also denoted as 1:200
- Underlined numbers denote a scale of 1 cm = 2 m (1:200).
- Other numbers denote a scale of 1 cm = 1 m (1:100).

It is recommended to use the larger scale (1:100) over the smaller scale (1:200) due to the advantages of larger-scale drawings. These benefits include the ability to produce more detailed, accurate drawings in a shorter amount of time.



IBF Investigations is a specialized forensic crime, crash, and fire analysis service that provides comprehensive investigation, mapping, 3D modeling, analysis, court testimony, and training services. With over 20 years of experience serving clients in South Africa, most of the SADC region, the Middle East, Canada, and the USA, we are at the forefront of the industry.

Whether you are the accused or representing the accused, the plaintiff or defendant in a civil matter, their legal representative, the claimant in a Road Accident Fund claim, or require an investigation or analysis in an insurance claim or repudiation, we are here to assist you.

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We look forward to working with you.

# **SECTION 2 – TAKING EMERGENCY CALLS**

When you are contacted about a collision, it is important to gather all relevant information, regardless of whether or not you were directly involved. This may include being called by a family member, friend, colleague, co-worker, or as part of your job duties for an employer or service.

It is important to note that involvement in a collision, even indirectly, may result in a court appearance. This is particularly true if you were directly involved in the collision. In court cases, there are often typical questions that are asked.

Whether you are the caller or the recipient of the call, it is important to obtain all of the information outlined in this section.

# When you get the call

In the realm of forensic collision investigation, it is a common misconception that the investigation begins when the first photograph is taken or when the scene is first observed. However, this notion could not be farther from the truth. The actual work starts as soon as the initial call comes in and concludes once the trial has reached a verdict. All activities in between are vital components of the investigation, such as case management, evidence collection, preservation, and testimony. There is no downtime when it comes to court cases or trials.

During testimony, the scope of questioning is not limited to what transpired at the scene, but it may also extend to who made the call, where the recipient was when the call was received, how long it took them to get to the scene, and why there were any delays in the process.

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It is imperative to note that the investigation of road traffic collisions commences at the point when the first call is made, regardless of whether the call is received by an emergency dispatcher, a collision unit, a private investigator, or a company representative. Even if the call is from a friend or family member, the assistance process begins right there and then. Once the call is answered, a traceable trail of information, action, time, location, and circumstances starts to develop. Thus, being prepared is essential during this critical period since it may affect the golden hour, which is the time between a person sustaining a severe injury and receiving qualified medical attention.

# **The First Record**

In the context of forensic collision investigation, the first record that can be obtained is the initial phone call. It is essential to record the date and time of the call as both are equally significant, particularly since calls can come in before or after midnight. As the person who has been contacted, whether you are a dispatch operator, company controller, family member, or friend, it is crucial to remain focused and not panic. The individual calling you has reached out for help and has specific goals in mind that are influenced by your relationship at that moment. They trust you and rely on you to assist them during this critical time. It is essential to acknowledge this responsibility and approach it with the appropriate level of respect.

#### **Take Charge**

When dealing with people in life-threatening situations, emotional distress, or unfamiliar circumstances, it's unlikely that they will be calm and collected. While it's understandable that telling someone to calm down is not helpful, the order in which information is received is critical, perhaps even more so than the information itself.

In any situation, there are numerous variables, some of which are unpredictable or unknown. When answering a call regarding a collision, various things could go wrong during the conversation, such as the caller losing consciousness, a secondary collision occurring, a fire starting, or signal loss.

Therefore, it's essential to make the most of every second of the conversation, obtaining the most pertinent and valuable information at each stage. To achieve this, take control of the call and inform the caller that you will be asking a series of questions that they must answer briefly. Assume control to safeguard the caller.

# **Phone Number First**

After a collision, individuals often find themselves in need of assistance and must rely on the kindness of strangers to contact their loved ones, employers, or emergency services. In such instances, it is not uncommon for individuals to receive calls from unknown parties seeking to offer assistance.

However, it is essential to treat every caller with the same level of respect and urgency since most people do not contact others for help in emergencies regularly. One significant issue that may arise is when an individual receives a call from an "unknown number" and, for various reasons, the call abruptly ends before vital information can be exchanged.

To avoid this situation, it is crucial to prioritize collecting the caller's phone number first, unless it appears on the screen or system. If the call is from a family member, it will be easy to return the call. Still, if the caller is unknown, or the family member's phone does not send caller ID information, the individual in need may be left stranded.

Thus, taking down the number is critical. Regardless of what happens next, having the number ensures that the individual can call back immediately or report it to the authorities for tracking or tracing.

# **Identify the Caller**

If an individual has received enough calls from crash scenes, they will quickly discover that the communication methods used in such situations can be unpredictable, and potential interferences can disrupt them. It is not uncommon for a bystander to call from the distressed family member's cell phone, and the call may end abruptly for various reasons. When the individual returns the call, a different person may answer, causing unnecessary delays that can significantly impact the deployment of essential emergency services.

To mitigate such delays, it is crucial to always ask for the NAME of the caller. This way, if the call is interrupted, the individual can call back and ask to speak to the same person again. Of course, if the person is no longer available, the individual must deal with whoever they can reach. However, maintaining communication with the same person throughout the deployment efforts enables the individual to gather more vital information quickly and efficiently than if they had to deal with several people.

Furthermore, when testifying in court, the name of the person who made the call could be a critical component and could help track down potential witnesses. Therefore, it is an essential aspect of case management that must be carefully considered.

## Make a Connection

Once the name of the caller has been established, it is important to introduce oneself and explain why the individual has been contacted. In situations involving collisions, it is likely that the individual will receive calls from people involved in the accident more often than from other bystanders. Therefore, providing the caller with one's name and role is essential. If the caller is a family member, friend, or colleague of a victim, it is vital to help them understand the role being played in the situation.

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By informing the caller of one's name and role, they will be able to report to their loved ones or colleagues exactly who they spoke to. This helps to reduce their feeling of helplessness and provides comfort to those in distress by letting them know that their employers or loved ones have been informed. Furthermore, it helps to establish a relationship of trust between the caller and the individual taking charge of the situation.

Being nothing more than a voice on the phone can potentially make the caller or victim feel disconnected from the situation. However, by knowing one's name, hearing that the individual is taking charge, and understanding that they know precisely what questions to ask, the caller or victim is likely to feel more connected and calmer. Establishing this connection only takes a few seconds, but it ensures that a reliable line of communication has been established.

Knowing who one is dealing with, being able to call back, and ensuring that the caller is aware of one's commitment are crucial in ensuring that the interactions leading up to the situation go smoothly. By doing so, the individual taking charge can gather the necessary information quickly and efficiently, thus ensuring that the situation is handled correctly.

# **Confirm the Location**

As a professional, it is important to gather accurate information about the collision as quickly as possible. Even if you are unsure of what actions to take, it is essential to know where the collision took place. It is important to remember that the caller may not be familiar with the area or may be experiencing emotional distress, making it difficult for them to remember details such as landmarks. Therefore, it is necessary to ask questions that can help narrow down the location.

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Start by asking where the caller was coming from and where they were heading. If needed, lead the conversation to narrow down the location of the collision. Look for landmarks, mile markers (especially on National or Interstate Roads), or natural features such as unique mountains, etc. At night, it may be more difficult, so asking about the last town they went through, their destination, and how long they have been traveling can help determine the location of the collision.

It is essential to gather accurate information, even if it takes an extra minute or two. This can save valuable time by providing clear and precise data to emergency services, preventing them from wasting time searching for the scene. It is important to stay calm, take charge of the conversation, and stay in control. Remember that small pieces of relevant information can be more helpful than a lot of general references.

#### **Services Present**

It is essential to maintain composure and a clear mind when handling emergency situations. Rushing into action without proper assessment can lead to wasting vital resources and potentially making the situation worse. If the call disconnects immediately after asking about the incident, take a moment to assess the situation and plan the next steps carefully. There are several courses of action to consider, such as verifying the presence of emergency services, identifying the need for additional services, and informing the caller of the actions you intend to take. By taking a thoughtful and measured approach, you can ensure that you are using available resources effectively and providing the best possible assistance to those in need.

- It is important to avoid the urge to immediately call for help or rush to the scene, as this can potentially waste valuable resources that may be needed elsewhere. Instead, it is best to remain calm and gather more information before taking any action.
- It is important not to make assumptions regarding the availability of emergency services. Even if there are ambulances or other services present, it is crucial to confirm their presence and availability. This will help to avoid any delay in getting the necessary assistance to the scene of the incident.
- As a professional, it is important to be specific and ask for short answers when determining the
  presence of emergency services. Ask if the police, ambulances, or fire services are present. List
  every service you know to ensure you have a clear understanding of who is there and who is not.
  Use this information to predict what services might be needed and how to efficiently allocate
  resources.
- It is essential to ascertain the caller's requirements and recognize the need for supplementary services, particularly in situations where minimal or no services are accessible. As a professional, it is advisable to apprise the caller of the emergency or other services you intend to contact to ensure that appropriate support is delivered.
- As a professional, it is crucial to convey to the caller that every effort will be made to provide prompt assistance. It is also vital to establish clear communication and assert control throughout the process, ensuring that the caller understands that you are taking charge and facilitating the necessary steps to address their concerns.

# **Services Required**

As a professional, it is crucial to carefully assess the information provided by the caller to determine the appropriate course of action. If the caller indicates that "everyone is present" and no services are required, the inquiry may proceed to the next set of questions. However, if the caller indicates that the scene is "fresh" and no services have been requested yet, it is imperative to confirm the correct services are called and dispatched. It is essential to keep in mind that the caller may be emotionally distressed, and their response may not be carefully considered. Therefore, it is crucial to verify whether "everyone" refers to the required emergency or official services.

Moreover, it is necessary to prioritize services in order of relevance. For instance, determining if the road needs to be closed and if traffic or state trooper services are necessary should be the first priority. Following that, inquiring about fire services or spills and whether anyone sustained significant injuries or requires an ambulance should be addressed. Finally, it is essential to ask if any vehicles need to be recovered or towed to ensure a comprehensive response.

As a professional, it is crucial to gather accurate and comprehensive information from the caller to ensure appropriate services are provided. In instances where the caller responds with "I am not sure" or "I don't know" to any of the questions, it is recommended to assume that the relevant services are required.

Additionally, it is essential to inquire about any possible involvement of drunken driving, speed, aggressive actions, or potentially stolen vehicles to ascertain the need for police involvement. Any incident that suggests the likelihood of a crime should be reported to the authorities, and a criminal case registered.

In situations where the caller is uncertain, it is advisable to probe the extent of damage to the vehicles involved, the severity of injuries sustained, and the aggressiveness of involved parties. The more significant the damages, injuries, and aggressiveness, the more likely it becomes that a crime is involved, and a police presence is necessary. Therefore, it is crucial to prioritize the safety and security of all parties involved and ensure appropriate services are dispatched promptly.

# Situation/Progress

As a professional, it is essential to focus on the actual situation and gather relevant information during emergency calls. While it may be tempting to ask for a detailed account of what happened, it is not always helpful in critical situations. Instead, it is crucial to gather information that would be required when contacting emergency services.

Questions should be directed towards the situation rather than the cause of the collision. For example, it is important to ask if anyone has died, if people are injured, if there are any entrapments, if any children are involved, if any vehicles are on fire, if the road is closed or obstructed, and what the weather is like. It is important to gather as many facts as possible about the situation and ask specific questions, such as the number of people who have died, the number of people who are trapped, the number of people who are seriously injured, and the number of people who are slightly injured or walking around.

It is important to note that the caller may be emotionally stressed, and it may be necessary to stress the importance of these vital questions. Ambulance personnel would not be concerned about the cause of the collision but would be interested in knowing how many patients are involved, if any patients are trapped, and the severity of their injuries. Therefore, it is crucial to remain calm and focused during emergency calls, gather relevant information, and provide appropriate assistance promptly.

# **Patient Counts**

In order to effectively coordinate emergency services, it is crucial to have an accurate count of the number and severity of victims. This information will enable emergency responders to plan and deploy resources more effectively. To facilitate this process, it is important to understand the codes used by emergency services. These codes are as follows:

- P1 or Red Patients: These are patients who are critically injured and require immediate advanced medical care under threat of death.
- P2 or Orange/Amber Patients: These patients are seriously injured and are at risk of becoming unstable unless transported to advanced medical care.
- P<sub>3</sub> or Yellow Patients: These patients require no immediate emergency care, but need an examination to confirm no serious injury. Patients who are uninjured may be classified as White or Green. It is important to note that an uninjured person is not considered a patient.
- P4 or Blue Patients: This category includes those who are already deceased or have been declared as such.

It is important to remember that any patient, regardless of the nature or extent of their injuries, is considered legally alive until declared dead by a qualified medical practitioner.

# **Elements Involved**

When dealing with an emergency situation, it's important to remain focused and gather as much relevant information as possible. While it may seem like this will take a lot of time and delay the reporting of the incident, it is crucial to ensure that the appropriate resources are dispatched to the scene. In addition to determining the number and severity of injuries, it's also important to gather information about the types of vehicles or elements involved in the collision. For instance, if commercial vehicles or trains are involved, special rescue and recovery units may be needed. You should also inquire about the presence of children, animals, police officers, or other hazards that may require specialized crews.

It's important to consider potential additional dangers, such as vehicles in water, live cables, fire, or heavy smoke, and share this information with emergency services. Gathering and sharing the correct information can save critical minutes or even hours, as specialized units may not be dispatched until other services arrive on the scene.

#### **Predict Results**

It is important to consider all possible dangers and report them accurately to emergency services. For example, if a vehicle is obstructing a road at night, this information should be mentioned to make the additional danger immediately apparent. In the case of a vehicle entering a rapidly flowing river, there is a risk of the vehicle being swept away and the person trapped inside being at risk of serious injury or fatality if the vehicle catches fire or runs out of fuel. By providing information about fluids or fuel running out of the vehicle, emergency services can better prepare and plan for the scene.

It is also important to note that a call that initially appears to be a single-vehicle collision might quickly escalate into a more dangerous situation, such as a vehicle being swept away by water or engulfed in flames. By prioritizing the determination of possible escalation of danger, and accurately relaying this information to emergency services, lives can be saved and the correct services can be deployed promptly.

By following these guidelines and gathering the correct information, you can play a vital role in saving valuable time, resources, and even lives.

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# Stay in contact

Now that the most critical information has been gathered, it is important to establish a personal connection with the caller or call taker. With the essential information already conveyed to emergency services, you may need to disconnect the call to allow for the dispatch of assistance. However, if time permits, it is important to provide emotional support to the caller by allowing them to express their feelings about the incident.

This is the moment to engage in discussions about what happened and how the caller feels. Once the caller realizes that you are composed, informed, experienced, and capable, they will feel better.

If you are the one reporting the incident, emergency services will appreciate your contribution and feel better prepared to respond to the situation. It is crucial to remain calm, not engage in the emotions of the caller, and not expect the dispatcher to share your emotions if you are the one calling.

By staying calm, following the steps in order of priority, and addressing relevant points in a structured manner, you will gather more precise information and share it effectively. It is essential to control the impulse to find out what happened first, as it is not always possible to act on this information immediately. The on-scene investigation will provide a more detailed understanding of the incident.

#### Going to the scene

In order to ensure an effective response to an emergency situation, it is important to take certain preparatory steps. Before leaving your home or office in response to a call, it is essential to ensure that you have all the necessary equipment and tools, which are listed in the REFERENCE section. It is also important to check that any devices you intend to use, such as your cell phone or camera, are in good working order and that their batteries are charged. Additionally, you should record the date, time, and location where you received the call, as well as the time you left your location.

To ensure your safety and that of others, it is crucial to inform someone else of your plans and destination or to ask the person coming to help you how long they will take. This information is important to help detect any potential issues or delays that may arise along the way. It is also important to keep a record of the mileage on your vehicle and the time you left, as well as any stops or delays you encounter along the way.

If you arrive at the location, you were given and find that there is no scene, it is possible that the address you received is incorrect. In this case, it is essential to call back and confirm the correct location, and to record the fact that you went to the wrong location and when you received the correct information.

It is important to remember that, unless you are operating as an official emergency service, you cannot speed to a scene. It is crucial to remain calm and rational and to proceed with caution, as safety should always be the top priority. In the emergency services, there is a saying: "Dead medics save no lives." This emphasizes the importance of prioritizing your own safety, as you cannot render assistance if you are not in a position to do so. Therefore, it is vital to be cautious and proceed with care at all times.

# **SECTION 3 – INVESTIGATION RECORDS**



When conducting an investigation, it is crucial to understand that it does not begin when you arrive at the scene or gain access to a collision site. Rather, there are several records that need to be kept from the moment you are first contacted. These records are intended to aid you in providing testimony in court, establishing a timeline of events, and ensuring that you have all necessary information for recorded or sworn statements. Like many other disciplines, proper record-keeping is critical for effective investigation.

It is imperative that an investigation be conducted in a thorough and professional manner. It is important to note that an investigation does not begin when you arrive at the scene or gain access to a collision site, but rather from the moment your phone rings. This is when your responsibilities as an investigator commence.

When deploying to a scene, it is vital to record the following information in a specific order to ensure that all relevant details are accurately documented:

- 1. The time and date of the initial call received.
- 2. The name and contact number of the person who called.
- 3. The location from which you deployed.
- 4. The address of the incident to which you were called.
- 5. The time you left your location.
- 6. The starting mileage on your vehicle.
- 7. The name of any assistants or colleagues accompanying you.
- Notify someone of your departure, destination, expected arrival time, and estimated duration of your investigation.
- 9. Document any delays experienced en route, including time, duration, and mileage.
- 10. Record the time and mileage of your arrival at the scene.
- 11. In cases where you arrive and find nothing, note the time of the call to confirm and the time you left.
- 12. Document the time and mileage of your arrival at the scene.
- 13. Identify the person from the service in charge at the scene upon your arrival.
- 14. Report to or inform the appropriate authority that you are beginning to take photographs or gather information.
- 15. Record the name and contact number of the police station responsible for the scene/incident.
- 16. Obtain the case number (starting with "CAS" in South Africa) and/or accident report number (starting with "AR" in South Africa).
- 17. Document the name, phone number, and address of each tow truck and the vehicle(s) they are towing.
- 18. Record the name and unit number of each ambulance and the number of patients being transported to which hospitals.
- 19. Obtain the GPS coordinates of the scene before leaving.
- 20. Document the date, time, and mileage when you are finished and leave the scene.
- 21. Record the date, time, and mileage when you return to base or arrive at your next destination.

# **SECTION 4 - CRIME SCENE AWARENESS**

Every scene consists of three types of evidence:

- Volatile Evidence: As an investigator, it is crucial to recognize that certain types of evidence are particularly susceptible to sudden changes or contamination, and therefore require prioritized attention. Examples of such evidence include the position of vehicles, weather conditions, the location of injured parties, and the presence of pedestrians. These variables can change without warning, rendering any subsequent investigation less reliable or conclusive. Accordingly, it is imperative that investigators prioritize the collection of such "unstable" evidence. In other words, if there is a possibility that a particular piece of evidence may disappear or be altered before it can be documented, the investigator should prioritize its collection over other types of evidence that are more stable or under their control. *The rule of thumb is simple: If you can't ask it to stay, get it first!*
- Short-term Evidence: As an investigator, there are elements of evidence that are subject to change but are expected to remain consistent until you have attended to the most critical evidence. These include indicators such as tire marks on the road, impact marks on walls, damaged poles, fences and barriers, and specific, detailed damage to vehicles. It is advisable to prioritize the documentation of volatile evidence before focusing on these details. *The rule of thumb is: "If it can't walk, it can wait."*
- Long-term Evidence: When conducting an investigation, it's important to consider the longterm evidence that will not change for days or even weeks after the incident. This includes elements such as the road design, trees, buildings, traffic lights, lamp poles, and other fixed structures. It's advisable to return to the scene during daylight hours, especially if the incident occurred at night, to capture all long-term evidence accurately.

The rule is: If it'll stay, come in the day.

It is important to remember that even though some evidence may be considered "long-term," there is still no such thing as "Permanent Evidence." Therefore, it is crucial to gather all evidence as quickly as possible. This book is specifically designed to guide investigators through the process of collecting evidence, starting with the Volatile Evidence, followed by Short-term evidence, and finally, the longterm evidence. While some steps may seem counterintuitive to those unfamiliar with investigative protocol, this process is based on years of experience and refinement. It is essential to trust the process and follow the steps outlined in the book.

It is imperative to never remove, shift, touch, or add anything to the scene. The goal is to preserve the scene in its original condition and, if applicable, bring it to court. Resist the temptation to showcase the severity of the collision, as news articles, social media feeds, mortuary documents, and accident reports will do that. Instead, focus on each vehicle as an individual element and remain objective. Record or photograph the scene carefully and meticulously, taking care to capture evidence for each element one at a time until you are done. Remember to always photograph the EVIDENCE and never attempt to photograph the "accident."

### WHERE WHAT AND WHY



When documenting evidence through photography, it is important to ensure that each item is captured in at least three sequential images, providing a wide shot to depict the location, a closer shot to indicate points of interest, and a specific shot to show details. This allows for easy identification of the item, its location, and the reason it was of interest in court. For instance, when photographing a wheel or light on a vehicle, the first image should display where it is located, followed by closer shots showing its appearance, and finally a detailed shot highlighting any damage. This approach is also applicable when documenting the position of pedestrians, scratch marks, damage, or street signs. Avoid the temptation to stand in one position and zoom in, as this may distort the perspective and lead to inaccuracies. Instead, use the widest zoom setting on your camera and physically move closer to the item to capture clear, accurate images.

### **Communicating effectively**

As a professional, it is important to understand that emotional, defensive, aggressive, confrontational, or deceptive individuals can hinder your investigation efforts. In addition to a list of required information, two essential techniques that are often overlooked in DIY manuals are the ability to collect more information than people realize they remember and the ability to detect deception.

While this DIY Manual cannot instantly transform you into a CIA Interrogation Officer or a Human Lie Detector, understanding the fundamentals of information collection and deception detection is crucial to collecting all the necessary facts.

Asking a person to "tell me what happened" is a Deposition-style interviewing method that police officers frequently use, but it is also one of the least effective ways to investigate road traffic collisions. This approach requires the individual to narrate their experience, but immediately after a collision, people are often emotional and will provide all their thoughts rather than the relevant facts. It is recommended to use alternative questioning methods that focus on specific details and facts. These methods include Cognitive Interviewing, which encourages the individual to recall as much detail as possible, and the SUE Technique, which assists in uncovering potential deception by analyzing the subject's speech and body language.

By using these techniques, you can effectively gather all the necessary information, even in the presence of emotional, defensive, aggressive, confrontational, or deceptive individuals.

Don't be surprised if a crash victim starts with something along the following lines:

"Hey, dude, I like... Jeeessss. I like thought I was like gonna die man! One minute I was like just sitting there, like minding my own business and like checking ahead of me when this like other car just like came out of nowhere and BAM! Ran right into me! I like still can't like believe that I didn't like die! My uncle died in an accident a couple of years ago and he fell out of his car when it like rolled over and stuff. It was like crazy man. The other guy was like drunk and everything and..."

And so it will go on...

As an investigator, it is important to be aware that emotional, defensive, aggressive, confrontational, or deceptive people can hinder your efforts at investigating a collision. To overcome these obstacles, it is essential to utilize two critical techniques that are often overlooked in DIY manuals: the ability to extract more information than people realize they remember and the ability to detect deception.

While this DIY manual cannot make you an expert in CIA interrogation or human lie detection, understanding the basics of information collection and deception detection can help you gather all the relevant facts required for your investigation. Deposition-style interviewing, where you ask a person to "tell you what happened," is a common but often ineffective method of investigation. This approach tends to elicit emotional narratives rather than relevant facts. Interviews should be designed to gather information and solidify the witness's version of events. Lawyers typically conduct interviews but receive little formal training in this area during law school (Meadows, 2017).

To ensure that your interviews are effective, it is crucial to understand the difference between a narrative and relevant facts. People tend to narrate their experiences, which can be emotional and lengthy, but may not include the specific details required for an investigation. Therefore, it is important to ask targeted questions and follow up with clarifying questions to obtain the facts needed for your investigation.

### Preparing for the interview:

- Run your conflict checks. It is crucial to keep track of all the new information and witnesses that come to light during an investigation. However, this can be a challenging task, especially when dealing with multiple parties and related entities. To prevent any potential ethical dilemmas, it is recommended to maintain a comprehensive database of all parties involved in the case and regularly cross-check it for any conflicts of interest. This practice will help ensure that the investigation remains impartial and transparent throughout the entire process.
- Outline your interview. When conducting an interview, it is important to structure it properly. This means preparing an introduction that explains who you are, why you are conducting the interview, and what the purpose of the interview is. However, it is important to keep in mind any confidential information that should not be disclosed during the interview. Additionally, it is wise to anticipate the questions that the witness may ask and plan your responses accordingly. This will help ensure a productive and effective interview.
- **Prepare an outline of key questions**. As part of your investigation process, it's important to develop a plan that will guide your questioning and help you stay on track. Your plan should

include a structure for the interview that allows you to build rapport with the witness and progress from easy, basic questioning to more challenging inquiries. A well-organized outline will help questions flow naturally and develop a rhythm that enables you to move smoothly through the interview. While your outline should provide a guide, you should also allow for flexibility to follow up on new information or explore unexpected directions that may arise during the interview process. By preparing in advance and remaining adaptable, you'll be better equipped to conduct a thorough and effective investigation.

Give thought to the special needs of the witness/client. It is imperative to ensure that the
interview location is physically accessible to the interviewee. Consider providing a sign
interpreter if required, and a native-language interpreter for individuals whose primary
language is not English. It is also important to note that interviewing a child witness may
necessitate obtaining consent and having a parent or guardian present. Additionally, if clients
or witnesses require a companion, it is crucial to provide a comfortable waiting area while
conducting the interview in another room.

### Conducting the interview:

- **Recording an interview.** When recording an interview, it is essential to obtain explicit consent before commencing the recording. Reconfirm the consent on record, and have the witness verify that consent was provided previously. Additionally, ensure that the date and names of all participating parties are stated. In the case of a telephone interview, make it clear on the recording, and attempt to verify whether other parties are present at the other end of the call.
- Word choice. It is crucial to recognize that during an interview, witnesses may be recalling the incident for the first time, and their memory can be influenced by the interviewer's approach. With each retelling, witnesses commit to a particular version of the facts. As such, it is essential to prepare for the interview, including choosing appropriate language for key elements related to the matter at hand. For example, if you represent passengers injured in a parked car hit by a

moving vehicle, using the word "collision" instead of "accident" may be more appropriate when asking about the incident. The word "accident" presupposes facts that may not be supported by the investigation, and its use can impact the witnesses' interpretation of the events.

- **Physical surroundings.** To conduct a successful interview, it is essential to minimize distractions, whether you are in your office or an external location. Where possible, position yourself to avoid having the witness facing a window or with their back towards a door. This positioning helps to minimize distractions and maintain the interview's focus. It is also essential to minimize any other potential distractions to create an environment that is conducive to effective communication.
- The power of position. The impression you create in an interview can be influenced by the position of the interviewer and the interviewee. The choice of position may be strategic, particularly if you are aware of the individual's personality before the interview. For instance, conducting an interview from behind a desk creates a formal tone and gives the interviewer a position of authority, while sitting in a chair opposite the witness is less formal but may make handling documents and notes more challenging. Sitting at a rectangular table with the interviewer in the middle and the client or witness on the end is informal but allows for easier note-taking and document handling. If the interviewer sits at the end of the table with the client or witness in the middle, this creates a more formal tone, with the interviewer in the position of authority.
- Your voice. Your voice is a valuable tool in the process of gathering information, and it can have a significant impact on the outcome of an interview. It is generally advisable to adopt a calm and neutral tone, slightly slower and more enunciated than your regular speaking pace. When conducting a telephone interview, consider "smiling" by turning the corners of your mouth up, as this can make your voice sound more friendly and approachable. At times, witnesses may become angry or agitated. Instead of raising your voice to be heard, try lowering your volume and continuing to speak in a softer, quieter tone. The witness will likely lower their voice to match yours, enabling you to communicate effectively. Remember the power of silence. When necessary, ask a difficult question and wait silently for a minute. The silence can motivate the witness to speak to fill the void, or it may exert psychological pressure, leading to more truthful responses.

- Vocabulary. It is important to communicate in clear and understandable language, avoiding legal jargon, terms of art, or business buzzwords. Consider your audience and adjust your language accordingly. The average U.S. high school graduate has a vocabulary of around 700 words in normal conversation, while the average college graduate has a vocabulary of approximately 1,200 words. It is essential to know your audience and communicate in a manner that they can comprehend. In general, avoid using slang, but it may be effective when interviewing a teenager if used appropriately. If a witness uses slang, colloquialisms, or idioms that are unfamiliar to you, ask them to explain the intended meaning to ensure clear communication.
- Make note of body position, eye contact, etc. It is essential to take note of not only what a
  witness says but also how they say it. When creating a witness memo, refer to specific
  observations rather than using broad statements such as "the witness appeared to be lying" or
  "the jury may not find this person credible." Without some frame of reference, it may be difficult
  to recall how you arrived at these conclusions three months later. By taking note of specific
  observations, you can provide a more accurate and detailed account of the interview, which can
  be essential in legal proceedings.
- Consider the phrasing of questions. Asking open-ended questions can be an effective way to
  elicit more information from a witness and can help the conversation flow more naturally.
  However, a hesitant or skeptical witness may not offer much information in response to this
  type of question. In these situations, it may be more effective to ask more specific questions that
  address the relevant issues directly. For example, instead of asking, "Tell me what you
  remember from that night," it may be more effective to ask, "Can you walk me through what
  happened from the moment you arrived at the scene?" Additionally, using specific examples
  and situations can help the witness understand what information you are seeking and can help
  guide their response.
- Focus on what is actually said. To conduct a successful interview, it's essential to actively listen to the witness and stay present in the moment. This means not getting too caught up in your outline or the next question on your list. Using active listening techniques such as restating what you heard can help you confirm and clarify the witness's statements. Additionally, it's important to be aware of your own personal biases and how they may impact your objectivity. This can help you avoid making assumptions or overlooking important details.

Finally, it's crucial to confirm the timeline of events to ensure accuracy in your notes and report.

- Get documents. As part of your process of gathering information, it's important to collect any
  relevant documents that are mentioned during the interview. If these documents are readily
  available, make copies or obtain them before you leave. Keep a note of any documents that
  require further follow-up. In some cases, diagrams may be useful to clarify the details of an
  event. Encourage the witness to draw what is being described and to label all the elements.
  Don't forget to have the witness sign and date the drawing. If the witness kept a calendar or a
  journal about the events, obtain a copy of it. This documentation can be valuable for future
  reference and can help support the witness's testimony.
- Concluding an interview. As you come to the end of your interviews, it's helpful to ask some standard questions of each witness. Consider asking, "Is there anything else you remember that you haven't yet shared?" or "Is there anyone else you think I should talk to?" It's also important to ask whether the witness has been contacted by anyone else regarding the matter. Additionally, having an investigation plan in place can help ensure that you've covered all necessary areas and verified all information.

### **Deposition-Style Interviewing**

There is a more effective technique for gathering information - deposition-style interviewing. This method allows you to control and guide the flow of information while extracting micro-facts that may be relevant to the investigation. A deposition-style interview is similar to a trial, where specific questions are asked and specific answers are given. With this approach, you can gather more evidence and prime the subject to detect deception early in the investigation. The questions must be designed to solicit short, simple answers that are too simple to lie about, which can lead to the subject unintentionally revealing relevant information. By asking specific questions, such as speed or cell phone usage, you can prompt the subject to either answer truthfully or display deception indicators. Using a deposition-style interview can be an effective tool for gathering information while maintaining control

over the investigation.

## When conducting an interview, it's best to ask simple questions that require straightforward answers.

Here are some examples:

- 1. What is your last name?
- 2. What is your first name?
- 3. When were you born?
- 4. How old are you?
- 5. What is your address?
- 6. Have you consumed any alcohol today?
- 7. If so, how much did you drink?
- 8. Were you wearing your seatbelt?
- 9. Were you using your cell phone?
- 10. Are you taking any medication?
- 11. Were your lights turned on?
- 12. Were you alone in the vehicle?
- 13. If not, who was with you?
- 14. Was your radio on?
- 15. What were you listening to?
- 16. Were any of your windows open?
- 17. What were you discussing with your passenger?
- 18. Where were you when you first saw the other car?
- 19. Did you apply brakes to avoid the collision?
- 20. Did you swerve to avoid the collision?

- 21. Were you feeling tired at the time?
- 22. Did you get enough rest the night before?
- 23. What alerted you to the impending accident?

By breaking down the interview into these simple questions, you can gather more information without making your subject feel like they are being interrogated. This approach also makes it harder for them to prepare and present false information. Asking more complex questions gives them a chance to create answers that benefit them. It's important to remember that people will often lie if they think it's in their best interest, and using simple questions can help you detect deception.

#### **Detecting deception**

It is important to note that detecting deception goes beyond just body language and can be achieved through simple techniques. However, it is crucial to avoid developing a superiority complex and making blanket allegations against people. The techniques shared here will only serve as indicators of deception and not a means to declare someone a liar to their face.

As an interviewer, your role is to record the subject's answers, allowing them to provide any response they wish while being aware of deceptive indicators. For instance, if you suspect that the subject is lying about their speed before an accident, you should not confront them but instead explore the issue further later.

To help you identify deceptive indicators, we will use the question, "What speed were you traveling at just before the accident happened?" as an example. A truthful person with no interest in deception would give a short and simple answer, such as "Sixty Kilometers per hour," with a possible justification like "I know this because I just went past a speed sign and remember that I reduced speed" or "I know this because I used my speed control." They might also say, "I cannot remember" or "I don't think I was speeding," adding a justification like "I couldn't have been going very fast."

However, a deceptive person might respond differently. For instance, they might give a vague answer such as "I was going at a normal speed" or "I don't remember," without providing any justification. They might also offer an answer that is inconsistent with other evidence, such as "I was going at 30 kilometers per hour," despite skid marks indicating a higher speed. Alternatively, they might answer the question with a question or become defensive or hostile, such as "Why are you asking me this?" or "I already told you, I don't remember." In summary, detecting deception goes beyond body language and requires a keen understanding of a subject's responses. By identifying deceptive indicators and understanding what they could mean, an interviewer can gather more information without making blanket allegations or accusing the subject of lying.

Let's look at some answers that might indicate deception...

**Example 1**: "What? What are you trying to say!? Are you trying to say I am speeding? How fast would you drive!? You cannot come and accuse me of speeding!"

In the field of deception detection, the behavior of attacking the interviewer or the question itself is known as *Attack behavior*. This can be a clear indication of possible deception as the subject may believe that by attacking the interviewer, they can intimidate them into dropping the question, thereby avoiding the need to provide an answer without actually resorting to lying. It is important to note that individuals often prefer not to lie and may employ various tactics to avoid being forced to do so, including attempting to make the question disappear through aggressive or evasive behavior.

Example 2: After a long pause... "Um... Probably around 60..."

A Behavioral Pause/Delay refers to any unnaturally long pauses that may occur during questioning. These pauses may include filler words such as "um," "uhhhh," "well," or "lemme see." The purpose of these pauses is to delay the answer, allowing the subject to consider their response, predict the next question, and determine how best to frame their answer to present themselves in the most favorable light. However, there would be no justifiable reason for taking an unnaturally long time to answer a simple question like "What speed were you traveling at just before the accident happened?" **Example 3**: "I never speed. I always stick to the speed limit and I am a very careful driver. I haven't been involved in any accidents in more than 20 years..."

A *Convincing Statement* is a type of deceptive response that aims to convince the interviewer of the subject's innocence without actually providing a direct answer to the question. These statements are designed to frame the subject in a positive light, but upon closer examination, they offer no real information. As an interviewer, it's important to recognize this type of response and redirect the conversation back to the question at hand. A useful technique to achieve this is to acknowledge the subject's statement and then ask a follow-up question related to the original question. By doing so, you can keep the conversation focused on obtaining a direct answer. If the subject continues to use deceptive replies, it is crucial to remain observant of other possible deception indicators.

Example 4: "Um... Well... I... Sorry, what exactly do you mean what was my speed?"

A possible deception indicator is the *failure to understand* a simple question. This tactic is used by individuals who want to buy more time to prepare a response that is most favorable to them. By feigning a lack of comprehension, they allow themselves more time to come up with a believable answer. As an interviewer, it's important to remain patient and calmly explain your question. Keep an eye out for further deceptive indicators as you proceed with the interview.

**Example 5**: "At 6oKm/h. I swear to God I never drive fast!" or "I swear on my mother's life that I wasn't driving fast. As God is my witness, I drove really carefully."

*Invoking religion* is a tactic used by some individuals to lend credibility to their statements by referencing religious convictions or texts. However, if the reference is presented out of context, it is likely an attempt to deceive. As an interviewer, it is important to recognize when a subject is using religious references inappropriately and to look for other indicators of deception.

Example 6: "How fast was I driving? Mmmm. How fast was I driving.... Lemme see...."

*Repeating the question* is known as a deception indicator, where a subject is using the extra time to prepare a convincing answer to a simple question. It suggests that the subject is buying time to consider the best way to frame their response. Be aware of this behavior and pay attention to other indicators of deception during the interview.

**Example 7**: "Well, my car is a modern, fuel injected diesel motor vehicle and it is capable of an acceleration of zero to 100 in 5 seconds and a top speed of 240 Km/h. I seldom drive that fast, because I am a cautious driver, but the road was reasonably quiet and I was just taking it easy. I cannot recall that I was speeding, because I remember looking at a building back there with a white line along its side and I thought to myself, ..." and so on...

This is known as *an overly specific answer*, in which the subject provides unnecessary and extensive information that goes beyond what is required to answer the question. Individuals who aim to deceive may use this tactic to make their answer seem more valuable or credible by including irrelevant facts or using complex language. However, it is important to note that not every indicator of deception is indicative of lying, as some people may naturally speak slowly or become nervous when asked certain questions. It is important to consider the overall context and number of deception indicators observed before making any conclusions. When interacting with individuals, it is important to remain calm, non-judgmental, and patient to encourage cooperation and prevent them from shutting down. These guidelines are not exhaustive and serve as examples of the types of responses individuals may give when attempting to deceive. Honest individuals typically answer questions directly and without hesitation.

# **SECTION 7 – CELLULAR TECHNOLOGIES**

In recent years, cell phones have undergone significant development to the point where they can now compete directly with dedicated cameras, video recorders, and GPS devices. While dedicated equipment has its advantages, it is not always feasible or practical for individuals to invest in such equipment for a professional collision investigation. This is particularly true for most people who may not consider equipment until they or a loved one is involved in a collision.

If a cell phone is the only tool at hand, it can still be used effectively. Although there are some limitations to using cell phones, they are not so severe as to make their use impossible. When considering different cell phone options, the methods and applications available can vary widely. For the purpose of this discussion, we will focus on two primary platforms: iPhone and Android.

## Using an iPhone or an Android Phone

There are several applications available for both iPhone and Android that can assist you in using your cell phone as a collision investigation tool. These applications can help you to record audio, take photographs, and record details more efficiently. Some of the applications you may consider include:

- Evernote This application can help you to keep detailed notes and record important information about the collision.
- Camera+ This application provides advanced camera features that can help you to take better photographs of the collision scene.
- Recorder Plus This application can help you to record audio at the collision scene and ensure that you do not miss any important details.
- DashCam This application can turn your cell phone into a dash cam and record video of the collision as it happens.

By utilizing these applications, you can make the most of your cell phone as a collision investigation tool and gather important information that can be used to determine fault and liability.

## **Cell Phone Camera**

Both Android and iPhone offer a built-in camera application that enables you to take photographs during the day or night, using various LED flash options. The modern cell phone cameras are capable of producing impressive results and can serve as a suitable alternative to dedicated cameras for collision investigations. To conserve camera memory and ensure you have sufficient storage space, it is advisable to reduce image size to around 1920x1080 whenever possible. Additionally, it is crucial to maintain your phone regularly to ensure that you have enough storage space to investigate a scene comprehensively.

## Audio Recording

When it comes to audio recording, both iPhone and Android have built-in applications that can be used for this purpose. The iPhone uses an application called Voice Memos while Android has one called Voice Recorder. Both perform the same task of recording audio, but it is important to know where to find the application on your phone and remember to stop the recording at the end of your investigation. To ensure that you don't lose the recording and can access it later, it's a good idea to share the recording via email to your own email address. This will ensure that you have a backup of the recording and won't encounter any issues with downloading it later.

## **SECTION 8 – MARKING EVIDENCE**

#### How to mark is as important as where to mark

In the context of marking the scene of a collision, it is important to first understand some basics. Firstly, it is crucial to avoid contaminating a crime scene, regardless of one's good intentions. A crime scene should never be disturbed or contaminated under any circumstances. However, the principle of "life over limb" applies equally. For example, if a collision occurs at night and a vehicle comes to rest on a blind rise with traffic approaching at high speed, it may be necessary to move the vehicle to prevent further injury or loss of life, even if there is a risk of contamination.

In such a scenario, it is essential to mark the position of the vehicle clearly before moving it, so that it can be accurately placed back in evidence. If time permits, taking photographs of the scene is vital and could help preserve the integrity of the evidence, even if the vehicle had to be moved for public safety. It is important to note, however, that the vehicle should only be moved as far as necessary to prevent injury and not towed or driven away from the scene by a tow truck operator.

When marking the position of a vehicle, it is important to use spray or lumber chalk or any other marking material that can clearly indicate the vehicle's position. Marking only the position of the wheels is insufficient and can lead to inaccuracies in the evidence collected.

When marking a collision scene, it is important to follow certain rules to ensure that the markings accurately reflect the position and orientation of the vehicles involved. Here are some guidelines to follow:

- Always mark the corners of the vehicles and follow the shape of the corners to accurately record the shape and any damage.
- Add an arrow at the position of the steering wheel to indicate the driver position and the orientation of the vehicle.
- If a vehicle has rolled over, still mark the arrow where the steering wheel was and add a circle to indicate that it rolled over.
- For trucks or buses, mark one dot or point at each wheel position to help identify the type of vehicle and the number and position of axles.
- Marking of vehicles should only be done if complete photography and measurement is not possible at the scene, and it should be avoided if possible to prevent contamination of the scene.
   On minor collisions, photographs should be sufficient if taken according to the guidelines in this e-book.

### When can you mark?

In situations where a crime is suspected, such as cases involving serious injury or death or when a vehicle is used as a getaway car, the vehicle should not be moved or marked. If the situation is not a crime scene, the vehicle may be moved only to reduce risk to other road users, but its position must be clearly marked. Leaving a scene can only be permitted by a police or traffic officer, except in cases of minor damage with no injuries or crimes and only if the parties involved have exchanged details.

It is crucial to keep in mind that any modification or addition to a crime scene is contamination, which should always be avoided. However, there may be situations where no alternative exists, such as when the vehicle's location poses a risk to other road users or entrapped occupants. Proper photography can often be more effective than marking, so it is important to follow the instructions in this E-Book carefully to avoid any issues with evidence, even in court.

### How do you mark?



When marking roads, it is important to be aware of any controversy surrounding the practice in your jurisdiction. If you have access to marking spray, it is advisable to have two colors on hand - one for yourself and one to provide to anyone who asks. This way, you can always demonstrate what you marked and where.

To mark the positions of vehicles, it is recommended to use silver spray and mark the corners of the vehicles, rather than the wheels. For trucks and their trailers, mark them separately if they are involved in the collision. Additionally, mark the positions of motorcycles, bicycles, and pedestrians to show their orientation.

If any objects or vehicles had to be moved or relocated, it is a good practice to mark their original position to demonstrate that you took all reasonable steps to minimize contamination of the scene.



When marking the positions of vehicles, it is important to mark the corners of the vehicles and not the tire or wheel positions, as the latter only record the wheel positions without any additional information. Marking the corners allows you to record the shape of the vehicle, including any damage to the corners, and to show the orientation of the vehicle. To make the markings more informative, always add an arrow on the driver's side of the vehicle, which indicates the steering position, the front of the vehicle, and the amount of damage observed. When marking a rolled-over vehicle, add a circle to the arrow on the side of the steering wheel, regardless of which side of the arrow the circle is on. To avoid confusion, it is advisable to use silver spray paint for all markings.



When marking buses and trucks, the same corner marking process should be used as for other vehicles. However, trailers present a unique situation as they have no steering wheel, and therefore, an arrow should be added on the same side as the towing vehicle (truck tractor). For commercial vehicles, such as buses, trucks, and trailers, little dots (spots) should be added at each wheel position, in addition to the normal corners, to confirm axle positions. Small lines should also be added at the 5th wheel position (shown by the green circle in the above image). It is important to note that the marks at the wheels and the fifth wheel can vary substantially from vehicle to vehicle since some buses can have exceptionally long front or rear overhangs, and not all trucks' 5th wheels are at the exact same position. These markings are vital elements that should be included since they can provide crucial information for later analysis. Articulated vehicles track inside as the pulling vehicle turns, and the 5th wheel and axle positions determine the exact path the vehicle will follow. This information is used for post-event crash analysis and is not always easy to find since databases for bus, truck, and trailer specifications are not as common as those for light motor vehicles.



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Stan has extensive experience in criminal and civil matters, road accident fund, and insurance matters and he has provided expert testimony in courts at all levels. He is are widely recognized and frequently featured in the media as a leading resource in our fields of expertise.

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We look forward to working with you.

# **SECTION 9 – BASIC INVESTIGATION**

The objective of this section is to provide guidance on conducting a quick investigation of a scene while still gathering sufficient evidence. This approach is suitable for situations such as inclement weather, potential danger, or minor damages, where expediency is more critical than comprehensive analysis. It should not be interpreted as a comprehensive investigative protocol. Rapid investigations have their time and place, and if you follow the instructions in this course, you should be adequately equipped to handle most situations, provided you follow up later.

While some of the material may seem repetitive in later courses, it is essential to distinguish between the two approaches. This course focuses on moving quickly and capturing as much as possible within the shortest timeframe possible. Later courses assume that you have the luxury of time. It is crucial to keep this difference in mind.

Moreover, this course is not intended as a shortcut for more severe scenes. It is specifically designed for high-pressure or low-risk situations where external dynamics mandate shorter exposure times. If you have access to only a basic camera or a cell phone with limited battery capacity, you may need to know the most crucial photographs to take.

In such circumstances, consider this list of critical photographs you should capture, even if you cannot employ all the techniques covered in this E-Book:

## Stand Back

## "you *must* discipline yourself to **stand back a bit"**

When involved in a collision, one unwittingly collects evidence that will determine fault in court, whether the matter is civil or criminal. However, photographs taken by involved parties are often too close to the vehicles, making it challenging for Reconstruction Specialists to analyze the scene. While it is natural to want to capture the damage to

one's car, it is essential to **step back** and take photographs that show the vehicles' approach, point of impact, trajectory, and final resting position relative to other objects, landmarks, and each other. This applies to pedestrians, victims, and motorcyclists involved in the collision as well.

In cases where one has limited means to photograph the scene due to exposure count, battery life, or time constraints, it is crucial to capture these core photographs. These photographs serve as the minimum requirement for proper documentation and analysis of the collision scene. Up to 4 images - SET THE STAGE



One of the primary challenges facing crash investigators is the dearth of proper orientation. Even experienced collision investigators have a tendency to proceed directly to the damaged vehicles. However, it is critical to maintain discipline and bear in mind that the goal is to gather evidence pertaining to an incident that occurred at a specific location. The objective is not to simply capture photographs of damaged automobiles.

Furthermore, prior to focusing on the actual cars and objects involved in the accident, it is imperative to "set the stage." To achieve this, photographs should be taken from a minimum of four angles, enabling the inclusion of all vehicles, markings, positions, and relationships. If a car is positioned in close proximity to a lamp post, for example, the pole should be included in the photograph to ensure that the vehicles can be accurately positioned within the scene. When two vehicles are involved, both should be captured in the photographs along with their respective relationships to one another. This approach facilitates the demonstration of how the vehicles ultimately came to rest in relation to the original collision event, which is a crucial component for later court proceedings, as the final resting position is employed in virtually all forms of collision analysis.

At this juncture, the objective is to demonstrate where the vehicles ultimately came to rest rather than focusing on the extent of the damage incurred.



## Up to 4 images - COVER THE ANGLES

In the event of an intersection being involved in an incident, it is recommended to obtain photographic evidence depicting the origin of all involved vehicles, along with the relevant sightlines available to the drivers. It is imperative to account for any potential stop signs, yield signs, and/or traffic lights present at the scene. The photographs obtained should aim to capture the visibility of these regulatory systems as the vehicles approach the intersection or area of collision.

The visibility and placement of such regulatory systems can serve as crucial evidence in court, thus thoroughness in documenting them is advised. It is advisable to survey the surrounding area, commencing from a point approximately 100 meters or 350 feet up the road, and to take photographs every 20 paces thereafter. The objective of capturing such photos is to illustrate what the drivers may have observed as they approached the area, as well as any potential visual impediments, faulty traffic lights, or missing signs that could have contributed to the incident.

### **Up to 15 images - PHOTOGRAPH THE DAMAGES**



When photographing damage to vehicles, it is important to capture specific details that hold relevance. Begin by taking photographs of each vehicle from all four corners, ensuring that the entire vehicle is visible within the frame. It is crucial to maintain a safe distance from the vehicles and avoid getting too close, as the objective is to document the position of the damage, rather than the extent of damage at this stage. In this regard, individuals tend to become too involved and tend to move in too closely to the vehicles.

The aim is to capture the location of the damage on the vehicle, rather than the severity of the damage. Once the corners have been photographed, proceed to take pictures of all four sides of the vehicle, ensuring that the entire side, front, or rear of the vehicle is visible. It is essential to ensure that the license plates of the vehicles are clearly visible in the photographs. In the case of larger vehicles, multiple photographs may be necessary to capture each side in its entirety.

### Up to 10 images - MARKS AND DEBRIS



In the event of any tire marks, whether rubber or wheel marks, being present on the road, it is essential to document them in a comprehensive manner. This involves capturing photographs of the marks along their entire length, as well as at least two pictures from the sides, indicating the start and end points of the marks relative to surrounding objects such as poles, trees, houses or drains. This is crucial for future reference.

When taking pictures of the tire marks, it is recommended to photograph them from the side from which they originated, in the direction of the vehicle's movement. In the case of exceptionally long marks, such as skid marks, it may be necessary to walk along the marks and capture multiple photographs (two, three, or even more), ensuring that the actual start of the marks is included in the photograph/s. It is imperative to note that it is a common mistake to photograph only the marks leading up to the vehicle, neglecting to document the start and end points adequately.

### Up to 4 images - POSITIONS OF VICTIMS/BODIES



When documenting an accident scene, it is important to handle sensitive issues with sensitivity and professionalism. If bodies are present, avoid photographing faces or entering crime scenes without permission. Instead, focus on photographing the final resting positions of any victims or bodies that were struck or that fell out of or off vehicles. Take care to photograph in a way that will show their relative positions and orientation in relation to the scene, using vehicles or landmarks as reference points.

Additionally, photograph license disks and other plates, signs, and warnings from close enough to show all text clearly and legibly on them, including vehicle details and expiry dates. Photograph flat, damaged, smooth, cut, or broken tires and wheels. Once these general photographs are taken, move in closer to focus on specifics.

Some examples of evidence that should be photographed include damage to glass, windshields, windows, mirrors, etc.; the position of the driver's seat (far back or forward); missing wheel nuts, studs, bolts, wipers, mirrors, etc.; airbags, i.e., whether they deployed or not; all vehicles present (there might be witnesses); flat, damaged, destroyed or cut tires or wheels; fluids, liquids, deposits, or debris on the road; and damage to road furniture, like barriers, lights, poles, etc.

It is important to remain calm and focus on one aspect at a time while documenting the accident scene. Rushing can cause you to miss important evidence. By being methodical and thorough, you can ensure that you have the necessary evidence to support your case in court.

## **SECTION 10 – SCENE PHOTOGRAPHY**

#### **Place vehicles and items**



Globally, it is generally the responsibility of Law Enforcement Units to investigate crimes, and as every crash scene has the potential to be a crime scene, it is important to be aware of limitations and recognize that photographing the scene may not be permissible for legal, moral, or ethical reasons. However, there is currently no law prohibiting individuals from photographing a crash scene, except for official instructions by a police officer. If individuals are alone at the scene, given permission, or representing a company, they will typically not experience any interference, but it is crucial to respect the police investigators' presence and not interfere with their functions as it could lead to arrest and charges of interfering with their duties.

It should be noted that a police officer's control over individuals is limited to the law, and as long as individuals do not enter a crime scene, contaminate it, interfere with the officer's duties, and comply with lawful commands, they should be safe. However, illegally parked vehicles may be asked to be moved. While it may seem onerous, in most cases, explaining the purpose of photographing the scene, showing respect for deceased parties, and not interfering with emergency or police services should allow individuals to continue.

Individuals may also be the first or only person on the scene and may want to record as much evidence as possible before official services arrive to prevent the loss of evidence due to a secondary collision or contamination later. However, individuals should recognize that any evidence recorded, including names, details, photographs, measurements, and observations, becomes part of the evidence and is obligated to leave their name and contact details with police officers so that they may be contacted to testify in court.

It is essential to understand that everything individuals do from the time of the collision or arrival on the scene makes them a material witness and they may be called to testify in court. Following the steps outlined in this book should alleviate any issues.

Problems arise when individuals stop at scenes to photograph crashes or disasters for entertainment purposes. However, individuals should not be discouraged from contributing by police officers sharing horror stories about being locked up or jailed for failing to appear, as this can only happen if individuals are instructed to appear by a court or receive a subpoena and then fail to appear.

It is crucial to recognize that individuals' work and willingness to appear in court as a witness could potentially save an innocent person from going to jail, ensure that a guilty person is convicted, or assist the court in making an informed decision. However, if individuals are unwilling or unable to appear in court as a witness, testify to what they found, did, and saw, and be subjected to cross-examination, they should refrain from photographing collision scenes.

If individuals' efforts are well-structured, their goals honorable, their photography good, and their records in order, a court should not be a cause for concern. However, a court can become an uncomfortable place if individuals are forced to appear there against their will or if they acted in a way that caused obstruction, interference, or contamination or if their efforts are blatantly biased.

#### What was where



When photographing crash scenes, it is crucial to first capture the location of the scene, in order to be able to return to it later. Courts are typically interested in details such as the location of those involved and what was visible from their perspective. Therefore, it is important to take photographs that clearly show the features of the scene, such as the surrounding area, what could be seen in all directions, and the timing of the collision. A minimum of ten photos should be taken.

To achieve this, it is recommended to move around the scene and take photos from a distance that allows all relevant elements to be included in the images. Avoid taking close-up shots that may obscure the context and placement of the evidence. It is essential to ensure that anyone who uses your photos in the future will be able to accurately place everything back in its original position.

Capturing the location and context of the scene in this manner is an essential component of a proper investigation.
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#### **Photographing Vehicles**



Once you have documented the location of the collision and the surrounding environment, the next step in collision scene photography is to focus on the individual vehicles involved. It is essential to capture multiple photographs of each vehicle from various angles to show precisely where and how it ended up on the scene, its orientation, and its location relative to other vehicles and permanent fixtures.

When photographing the vehicles, it is important to use permanent fixtures such as road signs, trees, buildings, mile markers, or other landmarks to orient the vehicles accurately. It may take several separate photographs of each vehicle from various sides, but it is crucial to have numerous orientation photographs.

It is important to approach collision scene photography with a clear mindset and to focus on orientation rather than the severity of the collision. By making sure that each vehicle is photographed individually, showing its position, direction, and relation to landmarks and the environment, the need to measure or mark can be eliminated.

Additionally, it is essential to consider the features of the road surface that can also help orient the vehicles, such as potholes, marks, roadside barriers, and culverts. When photographing the scene, it is also advisable to take photographs that show the sides of the vehicle to orient them to distant objects.

While orienting the vehicles, it is essential to ensure that each vehicle is easily identifiable in the photographs. In a scenario where two vehicles are of the same make, model, and color, including damage, number plates, or other markings can help distinguish between the vehicles.

In summary, when photographing the vehicles involved in a collision, it is crucial to focus on orientation, use permanent fixtures as reference points, capture multiple photographs from various angles, and ensure that each vehicle is easily identifiable in the photographs.

# Vehicle Specifics



Once you have completed the orientation photography of the vehicles involved in the collision, the next step is to capture detailed photographs of the damages sustained by each vehicle. This involves systematically photographing every panel, including those that are damaged as well as those that are not, while also taking note of the location, extent, and probable cause of the damage.

To achieve this, start by capturing images of the wheels, showcasing their location (WHERE) before zooming in to capture a closer view of the damage (WHAT). Then, take a photograph of the tread (WHY). Repeat this process for all the panels, glass, mirrors, windows, lights, reflectors, markers, and warnings on the vehicles involved, remembering to photograph all sides of each element.

It is essential to capture photographs of every element as soon as possible to ensure that no potentially

relevant details are missed. By meticulously documenting all damages, you will create a comprehensive record of the incident, which can aid in investigations or legal proceedings.

#### Details on the scene/area

It may be argued that this section has already been covered in "scene orientation," but there are additional considerations to be made. Upon arrival at the scene, it is recommended that you record the GPS coordinates using a GPS device or a cell phone with a built-in GPS receiver. This information can be entered on the Accident Report (AR) Form, which must be completed within 24 hours of all collisions, to help others locate the scene and confirm its location.

In some cases, the scene may be overcrowded or poorly lit, making it difficult to properly photograph and document the scene. In such situations, it may be necessary to return to the scene later, after it has been cleared or in daylight. Take the time to thoroughly examine the scene, paying particular attention to key elements such as tire marks, gouge marks, signs and boards in the area, road conditions, and road markings. Be sure to photograph not only the location of the collision, but also the approach taken by each driver.

Remember that drivers may have different viewpoints depending on the type of vehicle they are driving, so adjust your camera height accordingly. Take note of speed signs, warning signs, CCTV cameras, speed humps, schools, and other relevant features in the area, and photograph them in a way that shows their location and installation.

It is also important to photograph any damage to road furniture, such as bus stops, traffic lights, and light poles, to show the extent of damage caused by the collision. When doing so, exercise caution and wear reflective clothing to ensure your safety. It is worth noting that CCTV camera systems in the vicinity of the collision may only store footage for a limited period of time. If you wish to obtain CCTV footage, do so promptly and make sure you obtain enough footage to include the entire event.

## **Scene Photography**



When documenting the scene of a collision, it is essential to focus on key elements such as the location, traffic control measures, relevant signs, vehicle directions, and any damage to road furniture in the area. To gain a comprehensive perspective, it is recommended to "walk the scene" from the viewpoint of all involved parties, including drivers, witnesses, and pedestrians.

In addition, it is advisable to record the GPS coordinates of the scene, if possible, or the nearest Route Marker. Route Markers are blue square signposts that are typically installed every 200 meters on major roads, indicating the road section, distance from the start point, and direction. These markers may not be easily visible, particularly at night, and may be obstructed by trees or bushes. Therefore, it is crucial to locate them to ensure accurate documentation.

# Getting details at the scene

It is common for individuals involved in a collision to decline to provide their name and address, operating under the misconception that this action will shield them from liability. However, it is a legal obligation under the Road Traffic Act to do so, as outlined in our reference section. When managing a collision, it is imperative to obtain pertinent information from all involved parties, including:

- Name and address
- ID number and license number
- License code and expiry date
- Telephone number
- Vehicle make, model, and color
- Vehicle registration number
- Vehicle register number
- Details of the owner (if different)
- Insurance contact details
- Details of injuries (if any)
- Towing arrangements for the vehicles
- Destination of the vehicles
- Passenger details
- Witness information

Collecting these details is crucial for tracing and contacting involved parties and their passengers,

locating the vehicle for further investigation, and contacting insurance companies, if required.

Often, individuals may not recall their insurance information or may not disclose that they are not the owner of the vehicle. It is necessary to ask in order to obtain the necessary information.

It is also prudent to inquire about the purpose of the trip, whether it was for business or personal reasons, and whether passengers were paying for transportation (if applicable), as this information may affect civil claims liability and court proceedings.

Additionally, in cases where parties are transported via ambulance, it is important to obtain details of the ambulance service, unit or registration number, and the hospital to which the parties are being transported. Obtaining the name of the attending detective and the contact information for their station or unit is also vital, particularly in criminal matters where the detective will become the custodian of relevant information.

In summary, the critical information to obtain includes the details of the involved vehicles, the drivers, and the tow-in service, the name and contact details of the police station in attendance, the officer in charge and detective assigned to the matter, the number of individuals killed or transported by ambulance, and the witness details. To ensure accuracy, it is advisable to collect alternative contact information, such as addresses and email addresses, and to verify phone numbers by intentionally reciting an incorrect number to prompt correction.

It is important to note that individuals involved in a collision may erroneously refuse to provide their name and address, believing that doing so would shield them from liability. However, it is essential to comply with the Road Traffic Act, which stipulates that individuals must provide their name and address. Additional details may be found in our reference section.

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In instances where ambulances transport multiple individuals, it is crucial to ascertain which individuals are receiving medical attention at a hospital, as opposed to those who are simply "getting a lift" but may make claims later. In the event of a police presence, it is advisable to obtain the details of attending officers or those in charge, as well as the contact information for the relevant station, unit, or service. These details will prove invaluable in following up on the case at a later stage, particularly in obtaining details or a copy of the SAPS Accident Report (AR) Form.

Often, people neglect to gather finer details, assuming that seeing a uniformed police officer suffices. However, it is important to recognize that the country is divided into areas, and the station in attendance will have pertinent information about a case. This is particularly pertinent in larger cities, where numerous stations, clusters, satellite stations, divisions, and units exist.

In situations where the AR (Accident Report) and/or CAS (Criminal Reference) numbers are available, it is advisable to obtain them as they facilitate the process of following up on the case and its details. It is imperative to have access to the station that attended the scene and completed the AR Form, particularly when an insurance company requires a case number. Failure to obtain these details can result in challenges when attempting to contact the relevant station.

In criminal matters, obtaining the name of the attending detective and the contact information for their station or unit is critical. The detective will become the custodian of all relevant documents, which will be included in the "docket." The detective is, therefore, the primary point of contact within the police, and it is vital to obtain their information. Neglecting to do so may result in a lack of information and reference to the detective at a later stage. Being involved in a collision, especially one that is serious or one that involves criminal activity, is a serious matter. It is crucial to make every effort to obtain all pertinent details and the correct contact information for relevant officers and individuals involved. These details may prove vital in a trial at a later stage.

In summary, when involved in a collision, it is crucial to gather specific information to aid in the investigation process. This information includes identifying the vehicles involved, obtaining complete driver details, determining the destination of the vehicles and the towing service responsible for their transportation (including their name, address, and phone number), obtaining the contact details of the police station and officers involved, determining the number of casualties and their respective ambulance transport details, as well as obtaining witness information.

It is essential to gather alternative contact information from witnesses as relying solely on one cell phone number can be problematic due to factors such as phone loss, theft, or incorrect information. When collecting contact information from any party involved, it is recommended to read back their cell number while purposely getting one number wrong. If the individual immediately corrects the mistake, it confirms that the contact information provided is accurate. By gathering this information, you can ensure that all the necessary details are available to aid in the investigation and potential trial.





The following section serves as a quick reference guide for conducting an investigation and protecting oneself against liability, illegal prosecution, abuse, or intimidation. It is important to note that the information provided is for reference only, and one should take care to understand the context of each section before acting on it. Any conflicts with existing laws or regulations should be resolved in favor of those laws or regulations. This guide is intended to provide a basic overview of the elements to consider when involved in a road traffic collision, and should not be considered a comprehensive legal reference.

The first section includes a direct quotation from the South African Road Traffic Act, outlining the duties of a driver involved in a collision. This section is provided for convenience and should not be considered a substitute for a legal reference.

The second section includes an example of an Accident Report (AR) Form, and provides guidance on how to complete each section accurately. It also serves to remind the reader of the types of details that may be required when reporting a collision after the fact.

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The final section is a condensed list of the steps to take when responding to a collision, from receiving the call to completing the investigation.

It is important to note that this E-Book does not aim to establish the reader as an authority on the proper or complete steps to take in the event of a collision. Rather, it is the responsibility of the reader to familiarize themselves with all relevant aspects of the law, their rights, and the rights of others in relation to the subject matter. This guide should be considered a brief overview of the steps that can be taken in the event of a collision.

## Be Prepared and Equipped to Collect Evidence

It is highly recommended that drivers be prepared and equipped to collect evidence in the event of an accident. Before embarking on a trip, drivers should ensure that they have the following items:

- 1. A reliable pen or pencil and a white writing pad, at least A5 in size, for taking notes.
- 2. One yellow or white wax crayon for marking vehicle locations.
- 3. A disposable camera with at least 36 exposures to photograph evidence and damage.
- 4. A torch with fresh batteries, preferably with more than two batteries of any size.
- 5. A cheap reflective jacket to assist with flagging down traffic or aiding others.
- 6. At least three blankets, preferably "space blankets".
- 7. A first-aid kit with at least ten bandages and twenty dressings.
- 8. Sufficient airtime on your phone in case you need help and cannot reach emergency services.
- 9. At least two liters of water to wash wounds, rinse battery acid, or douse a fire.
- 10. An emergency triangle to prevent further accidents in the event of an initial collision.

The following is a comprehensive list of equipment that can be used for conducting road traffic collision investigations. This list is not presented in any specific order of importance but is designed to help ensure that investigators have all necessary items:

- 1. GPS device for routing and location data
- 2. Digital camera with a resolution of no more than 2MP for capturing photographic evidence
- 3. Audio recorder for recording interactions and interviews
- 4. Two-way radios and cellular phone for staying in touch or calling for help
- 5. Stationery for recording data and making notes
- 6. Flashlight for photography or movement in low-light conditions
- 7. Surgical gloves to ensure investigators leave no fingerprints
- 8. Working gloves to protect investigators from injuries
- 9. Face mask to prevent inhalation of particles
- 10. Marking spray in two colors for marking evidence and vehicles
- 11. Measuring tape for measuring size or height of evidence and vehicles
- 12. Rolling measuring wheel for measuring distances
- 13. Tripod for stable photography at night
- 14. Barrier tape for cordoning off scenes and restricting access
- 15. Road cones for redirecting traffic and marking evidence
- 16. Safety glasses for protecting eyes from debris and dust
- 17. Reflective jacket for visibility and identification
- 18. All equipment should be carried in a carry bag for easy transport and accessibility.

## Safety at the Scene of the Road Crash/Accident

Below is the professional version of the given text:

In the event of an accident, or if you come across one and wish to assist, please adhere to the following guidelines:

- Prioritize your own safety. If you are injured or in harm's way, you will not be able to assist anyone else.
- 2. Wear your reflective jacket, regardless of the time of day, and position the triangle at a safe distance.
- 3. Mark the location of the vehicles and victims at the outer corners, not at the wheels.
- 4. Apply pressure to any bleeding wounds, unless the blood is coming from the ears or mouth.
- 5. Apply dressings to any cuts or open wounds to attempt to stop bleeding.
- 6. Ensure that the victims have a clear airway, are able to breathe, and that blood can circulate.
- 7. Do not move any patients and make them as comfortable as possible where they are.
- 8. In case of injuries or entrapments, call the ambulance service first and then the police.
- Do not move or touch anything unless you are attempting to save a life or prevent further injury or death.
- 10. Photograph all vehicles from at least four sides and any marks leading up to each car. However, first, obtain permission from the police or traffic officials if they are present. Never take photographs of any bodies at the scene unless they are completely covered.
- 11. If you require permission to take photographs of your own accident or any other scene, inform the police or traffic officials of your intent to do so and reassure them that you will not be photographing bodies.

- 12. If your request to take photographs is refused, obtain the name, rank, force number, and station of the person/s refusing you this right. Remember that the ability to take photographs applies as a right only to your own accident and only if it is not a culpable homicide (loss of life) scene.
- 13. Attempt to obtain the names, addresses, phone numbers, and ID numbers of all drivers, passengers, and witnesses.
- 14. Document the injuries of each person by asking if they are hurt or by observing for yourself. This information may become particularly important later.
- 15. For all involved cars, document the make, model, color, registration numbers, and date of expiry of license disks.
- 16. Document the damage to each vehicle, including where it is, approximately how deep it is, and how you think it was caused.
- 17. Share all the above information about yourself with all other drivers present and involved.
- 18. If there is a risk to public safety, such as another accident possibly happening, you may legally move a car, but only if this action will not endanger entrapped patients' lives, and only if the position of the vehicle has been clearly marked.
- 19. Remember that you can only do so much. Do your best, and remain calm. Accidents are stressful events, so avoid adding to the tension by acting in a way that exacerbates the situation.
- 20. Although you may be preoccupied with helping others, do not forget about your own safety. Keep an eye on traffic and remain vigilant against approaching cars that may run into you or the scene.

#### What to expect from emergency services

When emergency services arrive, expect the following:

- Tow truck services might be the first to arrive. Unless they are qualified to or offer it, they are not there to render medical assistance - do not expect it.
- 2. Tow trucks are your first line of defense against further accidents. Let them park behind you or the accident scene at a safe distance and turn on their amber lights.
- 3. Unless you have a specific Tow-in service provider, take the first tow truck drivers business card, and keep it. You may need to explain who was first later - this is how they operate.
- 4. When an Ambulance or a rescue or fire vehicle arrives, tell them how many and where the patients are first, what injuries you observed, and, as briefly as possible, how you may have treated injuries.
- 5. Make the medical professionals aware of the injuries that are life-threatening first, then those that involve fractures (broken bones), and lastly those that are less serious. Include yourself in the last group if you are moving around.
- 6. If requested, supply the medical personnel with at least the first names only of victims if you have this information available.
- 7. When paramedics treat patients, they ask questions to establish the level of consciousness of patients. Do not try to assist by answering on behalf of patients unless you are specifically addressed with questions.
- When the police or traffic arrives, they will first wish to establish the extent and seriousness of the accident.
- 9. Whenever possible, do not give full narratives of the accident to any callers on the phone. You or information you have may be needed urgently by officials and other concerned parties might

try to get hold of you. Limit your call content to the extent of injuries and end the call.

- 10. Inform the police or traffic of any possible (or suspected) fatalities, as well as where you saw the bodies.
- 11. Tell police or traffic what you had to move, relocate, break or remove in order to render First Aid or assistance.
- 12. Tell police or traffic of any photographs you may have taken to ensure that they could get hold of you if these could be of assistance later.
- 13. Supply police or traffic with the details of involved parties, the damage to the vehicles, and identify the drivers or owners of the vehicles for them.
- 14. Next, the police or traffic may cordon off the area around the scene of the accident. If you were involved in the accident, remain inside this area. If not, leave the area, unless you are specifically requested to stay.
- 15. Next, the Ambulance, rescue, fire, police, traffic, and tow-in services might all take your details and particulars.
- 16. From the time you had the accident, to the time everyone has arrived, taken all details, interviewed you, removed your car and allow you to leave several hours may have passed, dependent on the seriousness of the accident. Be calm and patient - especially where lives were lost.
- 17. Before leaving the scene, be sure that the Ambulance Personnel, the Police and Traffic Officers and the Firefighters have your name and contact details.

## Enforcement and what to Expect on the Scene of a Road Crash

The following guidelines apply specifically to serious accident scenes and/or those involving loss of life:

- The first step is to cordon off the scene, allowing only emergency personnel, official investigators, and victims within the demarcated area. Uninvolved parties and onlookers should be prohibited from entering.
- 2. Non-essential personnel, such as uninvolved police, traffic, fire, and ambulance personnel, should remain outside the demarcated area.
- In the case of serious or fatal accidents, the police should oversee the scene since a criminal docket is likely to be opened.
- The police or traffic officials, depending on who handles the scene, should complete an Accident Report (AR) form at the scene.
- 5. Only in very minor accidents (Fender Benders) should police or traffic officials refer parties to the nearest police station.
- 6. Nothing should be moved, touched, or removed unless it promotes safety, prevents additional accidents, or saves a life.
- 7. The scene should not be cleared, cars moved, or evidence removed until all elements of the accident scene have been clearly marked with a permanent marking solution. Police or Traffic members making scratch-marks with a rock are not considered adequate.
- 8. In cases involving loss of life or major accident scenes, a senior police member or a member of the SAPS Legal Criminal Records Center (LCRC) or the Forensic Unit should oversee the accident scene - not a constable.
- 9. The detective for the area or shift may regulate activities at the scene if present.
- 10. At serious or fatal accident scenes, all elements of evidence, including vehicle positions, road-

surface evidence, vehicle relationships, road conditions, victim location, and vehicle damage, should be photographed by the police or an appointed or approved investigator.

- 11. The police or traffic member in charge should ensure that all information about all parties, including witnesses, is fully recorded on the AR form at the scene before leaving or declaring the scene complete.
- 12. Police or Traffic officers present should measure all elements of the scene accurately. Walking distances, using the heel-to-toe method or guessing distances will not yield an accurate rendition of the scene.
- 13. In cases of suspected drunken driving, the police should observe the party facing the accusation and determine whether they consider the person to be under the influence of an intoxicating substance.
- 14. Where there is reasonable suspicion (breath, slurred speech, imbalance, etc.) of a driver being under the influence, the police should arrest that person and have their blood drawn by a district surgeon within two hours of the alleged offense.
- 15. The following reasons should not be used by police members as an excuse for not being able to charge or arrest a drunken driver:
  - a. "We (the police) did not see him/her driving."
  - b. "He/she was not found behind the steering wheel of the car while the car was idling."
  - c. "We cannot charge him/her because there is no complainant."
  - d. "Your testimony will not stand up in court because you were involved in the accident."
  - e. "A witness has the right to refuse to testify and can therefore not be used as one."

f. "If we (the police) charge him/her with drunken driving, his/her insurance will not pay for your damage."

g. "He/she did not hurt anyone or cause any property damage."

h. "I/we (the police) can use our discretion as to whether we should charge him/her or not."

Here is a professional rephrasing of the given text:

Any suggestion that one of the following reasons could justify an action is baseless and unfounded, as outlined below:

- If a witness was involved in an accident, they may provide testimony regarding the identity of the driver, which can be admissible in court.
- The police cannot charge anyone solely based on having witnessed them in an accident.
  However, witnessing a crime is one factor that may lead to a charge being filed.
- 3. In criminal cases, the state is the complainant and law enforcement officers are responsible for enforcing the law.
- 4. Any individual who has observed a criminal act becomes a witness and may be required to provide testimony in court.
- 5. If an individual witnesses a crime, they are considered a witness and may be subpoenaed to testify. Failing to appear or testify could result in arrest.
- 6. The law does not reference insurance benefits, and accepting such a proposal could constitute fraud, which is a criminal offense.
- 7. The law prohibits operating a vehicle while intoxicated above the legal limit, regardless of any resulting harm or damage caused.
- The police may exercise discretion in determining whether a crime has been committed.
  However, once a crime has been established, failure to enforce the law could result in criminal Get certified in at-scene Road Traffic Collision Investigation – visit <u>https://bit.ly/ibfprotocol</u>

charges, such as dereliction of duty or being an accessory to the crime, and impede the ends of justice.

Here is a professional rephrasing of the given text:

In the event that you have been in an accident and the proper procedures have not been followed or important steps have been overlooked, skipped, or disregarded, it is important to take action. If you observe that police or traffic officials are failing to fulfill their assigned duties or attempting to leave the scene hastily, you should consider the following steps:

- 1. Obtain the name, rank, station, and contact information of the officer in charge.
- 2. Inquire as to why a certain task or function is not being carried out.
- 3. Notify the officer that the matter will be escalated to their superiors for further investigation.
- Report the incident to the station or unit commander, the provincial commissioner or director, and the Public Protector.
- 5. Request feedback from each of the parties involved.

Lastly, it is crucial to remain calm and avoid confrontation with law enforcement officers, even if you are convinced they are mistaken. They possess more authority than you do at the scene, regardless of whether you are in the right.

## Legal duties after a collision

In the event of a road crash, it is important to be prepared as it can be a traumatic experience that may leave you injured and disorientated. It is advisable to review the appropriate steps to take in the event of an accident so that you can respond correctly if the need arises.

It is worth noting that road crashes have legal consequences that can result in criminal charges, such as driving under the influence, driving without a license, or culpable homicide. Additionally, civil claims may arise for damage to property or personal injury, regardless of whether a criminal charge is filed. The law outlines specific duties for anyone involved in or contributing to an accident on a public road resulting in injury, death, or property or animal damage. The following steps should be taken:

## **Stopping the Vehicle to Assist**

- 1. Immediately stop your vehicle.
- 2. Ascertain the nature and extent of any injury sustained by any person.
- 3. Render assistance within your capabilities if a person is injured. If you are not trained in first aid, avoid actions that could worsen the injury.
- 4. Ensure that qualified help, such as an ambulance or rescue unit, is summoned as part of your responsibility to render assistance.
- 5. Unless required to go for help, remain at the scene until a police officer permits you to leave.

Failing to stop after an accident when required by law can lead to prosecution and, if convicted, a fine of up to R<sub>3</sub>6000, imprisonment of up to nine years, or both. If you were unaware of the accident, you may avoid prosecution, but the courts will presume you were aware if you cannot prove it. It is necessary to stop and report the incident at the nearest police station if you damage someone else's property, such as a vehicle or an electric-light standard. It is crucial not to assume it is acceptable to avoid stopping after an accident that does not appear to be serious. Failure to pull over and provide assistance is considered a hit-and-run and is a criminal offense, even if no one is killed or seriously injured.

As a responsible driver, it is crucial to be prepared for any unforeseen circumstances on the road. If you are involved in an accident, taking prompt action can save lives and prevent further damage. Here are some important steps to take immediately after an accident:

## Pull Over and Alert Other Drivers

Once you have pulled over, it is essential to turn on your hazard lights to alert other drivers of the accident. Additionally, it is recommended to place an emergency triangle approximately 45 meters from the accident site to warn oncoming traffic.

## Call Emergency Services

Immediately after pulling over, assess the situation, and call emergency services. It is important to provide your name, contact number, location, and detailed information about the accident, including the number of people injured, if any. It is advisable to have the following emergency numbers stored on your cell phone:

- 1. 10177 if an ambulance is required
- 2. 10111 if police response is required
- 3. 112 for any emergency on a cell phone.

When calling 112 from a cell phone, the call will be directed to a call center that categorizes emergency calls and routes them to the appropriate responders. According to the law, you must call the police to the scene of an accident if anyone has been seriously injured or killed.

It is also necessary to alert the police if you suspect any of the drivers involved in the accident are under the influence of alcohol or drugs.

## **Exchanging Information**

Following a road accident, it is mandatory to provide your information to anyone who has reasonable grounds to request it, including other drivers involved in the crash and law enforcement officers. If a police officer is present, you must present your license if you were driving. Please refer to the following guidelines for exchanging information:

- Provide your name and address, the name and address of the vehicle's owner (if not your own), and the vehicle's registration number to any person who has reasonable grounds for requiring them.
- 2. Obtain the details of other drivers and witnesses involved in the accident.
- 3. Request the details of others involved in the accident and any witnesses present.
- 4. Record the registration and license numbers of other vehicles involved in the accident.

Furthermore, it is crucial that you refrain from consuming any intoxicating liquor or narcotic drug unless it is administered on the instructions of a medical practitioner in the event of injury or shock. If a police officer requests that you submit yourself for examination by a medical practitioner, you must not consume any intoxicating liquor or narcotic drug before the examination or before reporting the accident particulars. Being under the influence of a narcotic drug can influence how you report the crash, affect your credibility, and make it challenging to prove that you were not under the influence while driving.

## What NOT to Do and Say!

It is important to exercise caution in what you say at the scene of a road crash. Strong emotions and elevated adrenaline levels can lead people to make statements that they later regret. It is advisable to remain calm and to say less rather than more. Even seemingly harmless remarks may be recorded in police statements and insurance claims and used against you in cross-examination. Some statements that should be avoided include:

- Do not admit fault or offer payment that could be construed as a bribe, as most insurers prohibit such statements of admission, offer, promise, payment, or indemnity.
- 2. Avoid statements such as "I will pay for the damages" or "I'm sure my insurance will take care of it" as they could be seen as admissions of fault. Similarly, do not agree to settle anything without the assistance of an attorney.
- Avoid admissions against interest such as "I didn't see you" or "I was on the phone," as these statements are admissible in court and may be used against you.
- 4. Avoid statements such as "I don't need medical help. I'm fine," which can be an admission against interest. It may take a few days for injuries to manifest, as endorphins and adrenaline may initially mask the symptoms of injury.
- 5. Above all, do not make any statements admitting fault, as this may impede the investigation and authorization of your claim.

## A few more Do's to Consider:

Here are a few additional recommendations to consider:

- If possible, take photos of the accident scene, including the damage to your vehicle and any other vehicles involved, as well as the surrounding area. This may be useful when filing your insurance claim.
- 2. Obtain contact information from any witnesses who saw the accident occur. Their statements may be helpful when determining fault and liability.
- If you have any injuries, seek medical attention immediately. Even minor injuries can develop into more serious issues if left untreated.
- 4. Contact your insurance company as soon as possible to report the accident and begin the claims process. Be prepared to provide details about the accident, including the date, time, location, and any other relevant information.
- 5. Follow any instructions provided by your insurance company regarding repairs or other steps you need to take to resolve the situation.

Remember, staying calm and focused after an accident can help you make better decisions and protect your interests in the long run.

#### **Reporting Duties to the Police**

It is incumbent upon individuals involved in a collision to fulfill their reporting duties by presenting themselves with their driving license at either a police station or authorized traffic officer's office within 24 hours of the occurrence. In the event of incapacitation due to injury, reporting must take place as soon as is practically feasible. Notably, drivers are obligated to possess a valid driving license when a police or traffic officer documents incident details, with failure to provide such documentation constituting an offense.

In cases where two vehicles are involved in a collision without bodily harm, drivers may choose to undertake repairs themselves and mutually decide to abstain from pursuing legal action. Nonetheless, both parties must report the incident to a police station within the prescribed 24-hour period.

Notably, failure to report accidents resulting in either property damage or bodily injury, irrespective of legal action intent, is considered an offense.

Where reporting is delayed, violators may receive either an Infringement Notice under the Administrative Adjudication of Road Traffic Offences Act (AARTO) or a Written Notice to Appear in Court (J 534)

#### **Claiming damages for a road crash**

In South Africa, it is not permissible to sue another individual for damages pertaining to injuries sustained in a road accident. However, those seriously injured in an accident where sole liability does not rest with them can seek compensation from the Road Accident Fund (RAF).

Individuals seeking RAF compensation can consult with attorneys specializing in such claims to determine the eligibility of their claim, receive guidance throughout the claims process, obtain

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assistance in gathering necessary evidence and medical opinions to bolster their claim, and obtain legal representation in the event of legal proceedings. It is also feasible for claimants to directly institute a claim with the Road Accident Fund.

## Taking a call

In the event of a collision, it is important to gather specific information in a particular order to ensure that vital information is obtained promptly. Follow this order to efficiently gather the necessary information:

- 1. Obtain the number of the caller for possible callbacks.
- 2. Ask for the caller's name for future reference.
- 3. Ask for the precise location of the collision to obtain better details.
- 4. Determine which services are currently available to avoid redundancy.
- 5. Find out which services are needed to determine the proper response.
- 6. Determine whether any fatalities have occurred to gauge the severity.
- 7. Confirm whether any entrapments have occurred to assess the required services.
- 8. Establish the number of patients to determine how many ambulances are required.
- 9. Determine the number of vehicles involved to calculate the number of tow vehicles needed.
- **10**. Determine the types of vehicles involved to ensure the proper recovery efforts are enacted.
- **11.** Identify the type of collision to assess the severity and potential danger.
- 12. Check for any spills or chemicals to arrange for necessary HazMat procedures.
- 13. Determine whether any criminal activity has taken place, such as theft.
- 14. Obtain a brief summary of what occurred.

#### **Records to keep**

As a professional, it is important to record the following details in order when deploying to a scene:

- 1. The time and date of the call when you received the first call.
- 2. Details of the person who called you, including their name and number.
- 3. Where you deployed from, including the address or location.
- 4. The address you were called to, as received.
- 5. The time you leave to go to the scene, such as when you left home.
- 6. The mileage on your car when you left, starting mileage.
- 7. The person who is with you, such as an assistant or colleague.
- Let someone know that you are leaving, where you are going, what time you expect to arrive, and how long you should be.
- 9. The time, duration, and mileage for any delays en route.
- 10. The time and mileage when you arrive at the scene.
- If relevant, the time of the call to confirm and the time you left again if you arrived and there was nothing to do.
- 12. The time and mileage when you arrived at the scene.
- 13. Who was in charge at the scene when you arrived, including the name and service of the person.
- 14. Who you reported to or informed that you were starting to take photos or gather information.
- **15**. The name and contact number of the police station responsible for the scene or incident.
- **16**. The case number (starting with "CAS" in South Africa) and/or accident report number (starting with "AR" in South Africa).
- 17. The name, phone number, and address of each tow truck and which vehicle they are towing.
- 18. The name and unit number of each ambulance and how many patients they are transporting to

which hospitals.

- 19. The GPS coordinates of the scene just before you leave.
- 20. The date and time when you are done and leave the scene, which might only be the next day, and your departure mileage.
- 21. The date, time, and mileage when you "return to base" or arrive at your next destination.

## Taking steps to protect yourself

In light of the high incidence of road traffic collisions in South Africa and the prevalence of corruption, bribery, and abuse of power, it is essential to take measures to protect oneself against false accusations and charges. One recommended measure is to have a mini digital audio recorder or cellphone on hand to record everything heard and said at the scene of a collision. It is important to note that recording audio in a public area is not considered eavesdropping, and recording everything that occurs can help prevent any false accusations or charges against oneself.

If a police officer requests a statement from you with the possibility of charges being laid later, you have the right to decline, but this may result in threats of arrest. If you are forced to provide a statement, it is advisable to send a text message to a trusted person with the relevant information, such as the date, time, location, and any other pertinent details. This can serve as evidence and protection against any false accusations or charges.

"I have just been involved in a collision at (location) and I have been asked by (officer's name) from (station) to make a statement. I refused but was threatened with (threat) so I have to comply or face consequences. Please SAVE THIS MESSAGE." Free EBook from IBF Investigations: https://ibfusa.info/



It is important to note that the aforementioned example email is for illustrative purposes only and is not based on a real-world event. It is also essential to acknowledge that the suggestion mentioned above assumes the officer involved is willing to provide their name. In the event that they decline, it would be prudent to include the registration number of your vehicle or the name of their station, if visible.

Unfortunately, in today's world, one must take measures to protect themselves, even from law enforcement officials. It is an unfortunate reality that where people are involved, there is always the possibility of criminal intentions, deceitful behavior, or corruption. Therefore, to safeguard oneself from potential criminal or unethical behavior, the use of audio recordings can be a valuable tool to have readily available. It is better to have such measures in place and not require them, than to need them and not have them at one's disposal.

## **Equipment List**

The following is a comprehensive list of equipment that can aid in conducting a thorough and efficient road traffic collision investigation. While the list is not presented in order of priority, it serves as a guide to ensure that all necessary items are readily available:

- 1. GPS device for routing and location data
- 2. Digital camera with no more than 2MP needed
- 3. Audio recorder for recording interactions
- 4. 2-way radios for staying in touch with others or calling for assistance
- 5. Cellular phone for the same reason
- 6. Stationery for recording data and making notes
- 7. Flashlight for photography or movement in low-light conditions
- 8. Surgical gloves to avoid leaving fingerprints
- 9. Working gloves for personal safety and injury prevention
- 10. Face mask for protection against inhaling particles
- 11. Marking spray with two different colors for different purposes
- 12. Measuring tape for measuring size or height of objects
- 13. Rolling measuring wheel for measuring distances
- 14. Tripod for nighttime photography
- 15. Barrier tape for cordoning off scenes
- 16. Road cones for redirecting traffic and marking evidence
- 17. Safety glasses for protecting eyes from debris
- 18. Reflective jacket for visibility and identification purposes
- 19. A carry bag for easy transportation of all equipment.

This list serves as a helpful guide for investigators to ensure they have all necessary equipment at their disposal for conducting thorough and efficient road traffic collision investigations.

## Taking a call

When receiving a call for a collision, it is crucial to gather information in a specific order to ensure that the most vital details are obtained first. This protocol will assist in the efficient and effective coordination of the response. The following is the recommended order of information to collect:

- 1. Number of the caller for potential follow-up communication.
- 2. Name of the caller for future reference and communication.
- 3. Location of the collision for precise identification.
- 4. Services present at the scene to avoid sending additional, unnecessary services.
- 5. Services required to determine the appropriate services to dispatch.
- 6. Number of fatalities to determine the severity of the situation.
- 7. Entrapments to confirm the need for specific services.
- 8. Number of patients to determine the necessary number of ambulances.
- 9. Number of vehicles involved to determine the necessary number of tow trucks.
- 10. Type of vehicles involved to determine the appropriate recovery efforts.
- 11. Type of collision to ascertain the level of severity and danger.
- 12. Spills or hazardous chemicals to arrange for HazMat, if necessary.
- 13. Criminal activity to alert appropriate authorities of potential theft or other criminal activity.
- 14. Brief description of the collision for initial assessment and response planning.
- By following this order of information collection, responders can ensure the prompt and effective

#### coordination of services and resources necessary for handling the collision.

#### **Records to keep**

To ensure accurate record-keeping when deploying to a scene, it is recommended to document the following information in the specified order:

- 1. Date and time of the initial call received.
- 2. Name and contact number of the caller.
- 3. Location from where you departed.
- 4. Address or location of the incident.
- 5. Time when you left your departure location.
- 6. Starting mileage on your vehicle.
- 7. Name of any assistant or colleague accompanying you.
- 8. Notify someone of your departure, destination, expected arrival time, and duration of stay.
- 9. Record the time, duration, and mileage of any delays en route.
- 10. Record the time and mileage when you arrive at the scene.
- 11. If there is no incident when you arrive, note the time you confirm with the caller and time you leave.
- 12. Record the time and mileage when you arrive at the scene.
- 13. Note the name and contact information of the person in charge at the scene.
- 14. Identify whom you informed that you will be taking photos or gathering information.
- 15. Provide the name and contact number of the police station responsible for the scene/incident.
- 16. Note the case number (starting with "CAS" in South Africa) and/or accident report number (starting with "AR" in South Africa).
- 17. Record the name, phone number, and address of each tow truck and the vehicle they are towing.
- 18. Note the name and unit number of each ambulance and the hospital to which they are

transporting patients.

- 19. Record the GPS coordinates of the scene just before you leave.
- **20.** Provide the date, time, and mileage of your departure from the scene and arrival back home.

# **MISTAKES TO AVOID**

The following are an array of common mistakes people make when investigating road traffic collisions.

#### Being too eager to leave

Investigators may prioritize "jumping in the car" and getting to the scene as quickly as possible, believing it to be the most critical aspect of the investigation. However, experienced investigators understand that collecting accurate information and ensuring that they have the necessary equipment is of greater importance than rushing to the scene without proper preparation. Failing to gather essential equipment or accurately record addresses can lead to critical oversights, such as uncharged camera batteries and forgotten equipment. Moreover, this approach could result in an investigator being involved in a collision, without anyone being aware of their destination or purpose.

#### **Not charging Batteries**

Ensuring that all your electronic devices have a sufficient and charged battery is a fundamental aspect of successful road traffic collision investigation. Inexperienced investigators often overlook this critical step, leading to a shortage of battery power in the field without any access to a charging source. Therefore, it is highly recommended to establish and follow routines that ensure all batteries are adequately charged and ready for use. This practice can prevent costly delays, missed evidence, and unreliable documentation.

#### **Driving too fast**

It is natural to experience a surge of adrenaline when responding to a collision scene, particularly if it involves a loved one, friend, or colleague. However, it is critical to prioritize your safety first and foremost. While you may feel the urge to rush to the scene, it is crucial to take a moment to calm down and think rationally. Even if you manage to arrive a few minutes earlier, it will not matter unless you are authorized to speed or are a law enforcement or medical professional. Take your time to arrive safely and with a clear head.

#### **Overstating your role**

When rushing to the aid of a family member, friend, or colleague, it is important to identify yourself as a such to avoid causing tension with the legally mandated services. Refrain from declaring yourself as a "Forensic Investigator" or expressing your intention to conduct a full investigation, especially if you are not from an official service. Instead, explain that you are there to help or that you are representing the company or organization involved, and would like to take some photographs or gather information. This approach is more likely to get you cooperation from the authorities and ensure that you are not seen as an impostor or rival on the scene.
## Not keeping accurate records

It is important to note that while it may seem tedious to record all of the information recommended in this book, it is crucial for ensuring that you can contribute positively in court. Questions such as those listed below are commonly used in court to determine your role, function, contribution, or mandate:

- 1. Who informed you about the accident?
- 2. What time did you receive the call?
- 3. What time did you arrive on the scene?
- 4. Why did it take you so long to get to the scene?
- 5. How did you determine that the accident was serious?
- 6. Who accompanied you to the scene?
- 7. Who gave you permission to take photographs?
- 8. How far was the scene from your residence or workplace?
- 9. Who was in charge of the scene?
- 10. When did you depart from the scene?

While you are free to decide whether or not to follow the advice in this book, recording this information can be immensely helpful in court proceedings.

## Using only "Auto" settings on your camera

Becoming acquainted with your camera can enhance your photography skills, particularly in low-light settings, by disabling the flash and utilizing a tripod. Additionally, enabling the macro setting when photographing license plates, and deactivating it thereafter, can significantly improve the clarity of your photos.

#### Not using a Tripod

When attempting to capture photographs in low-light situations, relying solely on the camera's automatic settings and flash may seem like the simplest approach. Unfortunately, this approach is only effective for natural subjects, such as individuals. When emergency services or vehicles with reflective materials are present, the camera may struggle, resulting in dark photos with over-exposed bright lines and shapes.

To overcome this issue, it is recommended that you experiment with other techniques. One option is to use a tripod to stabilize the camera and take photos with the flash turned off. However, this will result in slow shutter speeds, potentially leading to blurred photos if the camera is not perfectly still. Alternatively, you can try using artificial lighting, such as a flashlight, to "paint" the scene while the camera shutter is open. This experimentation can lead to more successful and creative photographs in low-light situations.

#### Not recording where vehicles are taken

In many cases, it may be difficult to capture detailed photographs of a collision immediately following the incident, particularly at night when lighting conditions are poor. The urgency to clear the scene may also contribute to the difficulty of capturing comprehensive images of the vehicles involved.

However, it is crucial to gather proper evidence, and neglecting to do so can result in a loss of critical information. For instance, by solely recording the tow-in service that is taking the vehicle away, its destination, and contact details, you may miss out on opportunities to gather more in-depth evidence the following day. Unfortunately, this has led to the loss of critical evidence in the past. Therefore, it is essential to capture as much detail as possible during the initial investigation to ensure all necessary evidence is preserved.

#### Using Camera Zoom

It is a common misconception that zooming in on evidence is a simpler alternative to physically approaching and examining it. However, relying solely on zooming limits investigators to only one viewpoint and one side of the evidence, resulting in an incomplete assessment. To gather evidence properly, it is important to move closer, photograph from multiple angles, and get even closer (keeping in mind the Where, What, Why).

Additionally, zooming can distort perception as it eliminates the benefit of monocular vision. When viewing a zoomed-in photograph without knowing the level of zoom used, perspective and depth perception can be lost. This can cause bends to appear sharper, skid lines to seem shorter, and vehicles to appear closer together.

Therefore, whenever possible, physically walking closer to the evidence is the best approach. It allows for a more comprehensive examination of the scene and reduces the risk of distortion. Of course, there may be situations, such as hazardous spills or closed-off areas, where physical examination is not possible. However, in general, zooming should be used sparingly and only when necessary.

#### **Taking Portrait Photographs**

It is common for individuals to capture photographs in portrait orientation (higher than they are wide) when using their mobile phones. Novice photographers may also tend to hold their cameras sideways for aesthetic reasons. However, it is important to note that since we naturally see the world in a wide view, landscape orientation (wider view) is preferred when capturing photographs for reports. While portrait orientation can be used in certain situations, it should be used sparingly. As much as reasonably possible, landscape orientation should be the preferred choice when capturing photographs for reports. This ensures that the photographs provide a clear and accurate representation of the scene and the evidence, consistent with how the human eye perceives the world.

#### Not using an Audio Recorder

While it is reasonable and logical to use an audio recorder when interacting with individuals at a collision scene, investigators often overlook this valuable tool by leaving their recorders in their kits or forgetting about them altogether. Audio recording provides the advantage of recording confessions, permission to access the scene, and interactions that could potentially be denied or misrepresented later.

It is natural to feel uneasy about recording all your actions at the scene, but experiencing the repercussions of being on the wrong side of a lie or misrepresentation can emphasize the absolute value of audio recording. It is essential to record everything from the time of arrival until departure to prevent any potential issues. It is better to record everything and hope that nothing goes wrong than to leave it behind and face unforeseen challenges. In many instances, things can go wrong, and it is essential to have accurate recordings for reference.

#### Not getting details of witnesses

It has been observed that even seasoned police officers tend to only gather the initials, surname, and cellular phone number of witnesses, without obtaining additional vital information. Unfortunately, this approach often leads to errors in recording phone numbers or failing to update them when witnesses change their contact details.

Given the crucial role witnesses play in collision investigations, it is surprising that investigators devote

a relatively small amount of time to collecting comprehensive information from them. Therefore, it is recommended that investigators gather all relevant details from witnesses, including their addresses and email addresses.

#### Not keeping records on file

It has come to our attention that even experienced police officers who have access to departmental computers and storage facilities often fail to keep proper records for future reference. While investigators may take several hundred photographs at the scene of a collision, only a fraction of them typically make it into the final report. This is normal practice as it would be impractical to include 500 or more photographs in a single report. However, investigators often find themselves in a difficult position when requested to produce all photographs, field notes, and measurement sketches. For this reason, it is essential to keep records in multiple locations.

To prevent data loss, we recommend that investigators avoid leaving photographs on their camera and instead download them after each case. It is also vital to create a backup of the files, with CDs or DVDs being the best options for long-term storage.

Furthermore, to ensure the preservation of critical information, it is suggested that investigators photograph all field notes as soon as the investigation is complete and add them to the at-scene photography file to prevent loss. To achieve this, it is recommended that investigators follow the steps outlined below for each case:

- 1. Conduct the investigation, take photographs, and make notes.
- 2. Photograph all field notes before leaving the scene.
- 3. Download your camera to your computer immediately upon returning to your home or office.
- 4. Create a backup immediately using a storage option such as DVD, CD, or Dropbox. Get certified in at-scene Road Traffic Collision Investigation – visit <u>https://bit.ly/ibfprotocol</u>

5. Store each file in a separate folder with a date for easy future reference.

## **Defending your opinion**

As an investigator, your primary responsibility is to gather evidence such as photographs, measurements, and notes. It is crucial to remain impartial and avoid forming an opinion regarding the scene. If you allow yourself to become biased and attempt to prove a particular viewpoint, your evidence may be excluded or disregarded in court.

To avoid goal bias, it is essential to see the collision scene as a collection of unrelated components. When photographing a vehicle, concentrate solely on that specific element and ignore others. Collect and record evidence relevant to that one component, and avoid committing emotionally to the scene or the individuals involved.

By maintaining objectivity and focusing on breaking down the scene into its component parts, you can effectively gather evidence and avoid the pitfalls of goal bias. Remember that your goal as an investigator is to gather evidence, not to prove a particular point of view.



IBF Investigations is a specialized forensic crime, crash, and fire analysis service that provides comprehensive investigation, mapping, 3D modeling, analysis, court testimony, and training services. With over 20 years of experience serving clients in South Africa, most of the SADC region, the Middle East, Canada, and the USA, we are at the forefront of the industry.

Whether you are the accused or representing the accused, the plaintiff or defendant in a civil matter, their legal representative, the claimant in a Road Accident Fund claim, or require an investigation or analysis in an insurance claim or repudiation, we are here to assist you.

Stan has extensive experience in criminal and civil matters, road accident fund, and insurance matters and he has provided expert testimony in courts at all levels. He is are widely recognized and frequently featured in the media as a leading resource in our fields of expertise.

To reach us, please visit our website at <u>www.ibfusa.info</u>, send an email to <u>mailto</u>: <u>ibfinvestigations@gmail.com</u>, or contact us during office hours at +27 63 891-8200.

We look forward to working with you.

# **HOW SEATBELTS SAVE LIVES**

The use of seatbelts is a crucial factor in saving lives during accidents. However, the mechanics of a seatbelt are often misunderstood. Many people tend to associate seatbelts solely with the webbing or the black (or other colored) strap that runs across the lap and chest. In reality, a seatbelt comprises various components that work together to provide optimal protection.

To gain a better understanding of how seatbelts save lives, it is essential to examine each component closely.

## The webbing

The webbing, which is the most visible component of a seatbelt, is not a simple material. It must fulfill multiple requirements to be effective in its role of restraining and protecting the passenger during an accident. The webbing needs to be able to withstand immense forces, but it must not be so rigid that it causes injury. Therefore, seatbelt webbing is designed to be slightly dynamic, allowing it to stretch slightly under force.

To achieve this flexibility, the fibers used in the webbing are finely woven in a way that permits them to move slightly. This results in a soft, yet extremely durable material that can withstand significant stress without causing discomfort to the wearer. Additionally, the webbing must be long-lasting and capable of withstanding exposure to sweat (acids) and other elements for an extended period. Typically, it should last longer than the life of the vehicle.

#### **The Anchor Points**

The anchor points of the seatbelt system are crucial to its safety and effectiveness. During a full-frontal collision, the anchor points must remain secure under the extreme forces exerted on them. When conducting a vehicle inspection for seatbelt use or performing a Technical Fleet Audit, it is essential to ensure that all anchor points are secure, free of damage or wear, and correctly fastened.

The anchor points are where the most significant forces are exerted, and even the best-designed seatbelt system will not function effectively if the anchor points are not appropriately secured and maintained. Therefore, it is critical to inspect and maintain the anchor points regularly to ensure the seatbelt system is functioning optimally and providing the necessary protection to the passengers.

#### **The Buckle**

The evolution of the seatbelt buckle has undergone several significant improvements over time. Initially, the buckle was a simple latch system. However, as safety concerns arose, the design underwent changes to address critical issues that compromised its effectiveness.

For instance, incidents where people got stuck in cars and burned to death, or elbows accidentally hitting the buckles and releasing them, led to the development of advanced designs that could prevent such occurrences. Additionally, people found it challenging to exit vehicles when hanging upside down as too much force was required to release the buckle.

As a result, seatbelt buckles have evolved to their current state, where the release catch is recessed to prevent accidental release, and the mechanism is designed better to prevent any faults. Furthermore, the unit is designed to function even if the plastic melts in a fire, ensuring that the seatbelt system provides optimal protection during emergencies.

#### The Lock and Pawl system

The lock and Pawl system is actually rather complex, as this image clearly shows:



In essence, the seatbelt mechanism functions by means of a geared spindle, which operates in response to the amount of force exerted upon it. A gentle pull will cause the gears to remain disengaged, allowing the seatbelt to extend freely. However, a sudden jolt or heavy tug will engage the gears, thereby locking the seatbelt in place. This mechanism is designed to provide both ease of use and a high degree of restraint in the event of a collision or rollover.

Furthermore, modern vehicles are equipped with shackle sensors that work in tandem with airbag deployment units. These sensors detect whether a seatbelt is being worn, and if it is not, the airbag will not deploy. This is because an unrestrained occupant would be at risk of colliding with the airbag and suffering serious injury. By integrating these advanced safety features into their designs, manufacturers have greatly enhanced the protective capabilities of seatbelts and the overall safety of vehicles.

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#### **Pyrotechnic pre-tensioner**



The seatbelt is a critical safety feature in vehicles that has undergone significant advancements in design and technology to improve occupant safety during collisions and roll-overs. Automatic seatbelt tightening units, which can be either explosion- or spring-tension-based, serve to secure the seatbelt around the occupant during an impact. Studies have shown that even in rear-end collisions, where this type of system is not installed, occupants may be ejected towards the rear of the vehicle if their seatbelt is not properly secured or if the belt design is too loose. Overall, the seatbelt plays a crucial role in preventing injuries and fatalities in vehicular accidents and remains a vital component of modern vehicle safety systems.

#### Speed

It is important to note that seatbelts are not infallible and have operational limitations. At higher speeds, particularly beyond 80 km/h, a collision with a fixed object could result in the system becoming part of the fatality mechanism. Seatbelts are designed to reduce the risk of injury or death, but they cannot prevent death in all cases.

To understand this, we can look at the dynamics of a frontal collision and the sequence of relevant events. First, the driver applies the brakes, causing the lock-and-pawl and associated systems to activate, locking the seatbelt webbing in place. The occupants start to lean forward, but are partially restrained by the seatbelts.

When the vehicle collides with an object, the front impact sensors engage and send a signal to the Airbag Controller Unit. The ACU then checks to see if the vehicle is in motion, if there are occupants in the front seats, and if the seatbelt shackles are engaged. If all these conditions are met, the ACU deploys the seatbelt pre-tensioner and the airbag. The vehicle decelerates rapidly, but the occupant is still moving forward. The seatbelt decelerates them before they collide with the dashboard, reducing their deceleration and lessening the forces on their organs.

However, in extreme cases such as a collision with a solid wall at high speeds, the forces on the body may still be too extreme for the human body to tolerate. The internal organs are fragile and may sustain fatal injuries, as is the case in approximately 18% of automobile collisions.

More information on traumatic aortic rupture can be found on Wikipedia at http://en.wikipedia.org/wiki/Traumatic\_aortic\_rupture.

#### **Types Of Collisions**

Now that we have discussed the importance of delayed or reduced deceleration in seatbelt design and its impact on survival rates, it is important to consider another crucial factor - the type of collision. In a side impact collision, the distance between the occupant and the vehicle's door or frame could be mere centimeters. In such scenarios, the nearest occupant takes the full force of the collision almost directly, rendering the seatbelt largely ineffective since its primary function is to keep the occupant in the seat, which is situated right next to the door. As a result, seatbelts have little positive effect on survivability Get certified in at-scene Road Traffic Collision Investigation – visit https://bit.ly/ibfprotocol

in side-impact collisions, unless the collision is from the far side and the forces are not too great.

Similarly, in roll-over collisions, seatbelts provide protection only by keeping the occupant in the seat, as the lap belt is designed to do. However, if the roof caves in, the seatbelt cannot safeguard the occupant's head. Furthermore, in situations where a vehicle, such as a truck, penetrates the cab of a lighter vehicle, the driver or occupants could be killed in their seats, rendering the seatbelt all but ineffective.

Nonetheless, it is essential to remember that seatbelts still save lives in most forward-moving collisions, but only if they are worn.

## **SPEED ANALYSIS**

At the Arrive Alive website, our mission is to not only inform the public about road crashes but also to thoroughly investigate and identify the contributing factors to these incidents. By doing so, we can provide valuable information and advice to prevent future crashes and promote road safety. One of the crucial topics we emphasize is the importance of adhering to the Rules of the Road and Speed Limits, as well as adjusting speed based on the road conditions, traffic, and weather.

It is worth noting that when high-profile individuals are involved in road crashes, there is often a rush to analyze and assign blame. However, it is important to take a measured and objective approach to investigating these incidents to arrive at an accurate understanding of what occurred and how similar crashes can be prevented in the future.

## **Crash Investigation and Speed Assumptions**

Ensuring accurate and evidence-based reporting of road crashes is paramount in understanding and preventing future incidents. As such, it is crucial to avoid making assumptions about the cause of a crash, particularly with regards to speeding. In an effort to shed light on the complex process of crash investigation and analysis, we have sought the expertise of experienced investigator Stan Bezuidenhout. Through a Q&A format, we will explore the multifaceted factors that must be considered before concluding that speeding was a factor in a given crash.



It is important to exercise caution when making assumptions about speed in the aftermath of a vehicle collision. In cases where the damage sustained is minor or occupants survive with little injury, the visible damage to the vehicle may be primarily cosmetic, and assumptions about speed may be misguided. Our team has encountered numerous cases where expert analysis, as well as police reports, initially described damage as severe or serious, only to later reveal that the underlying structures remained largely unscathed, including the bumper carrier bracket. It is critical to first evaluate the full extent of the damage sustained, including the displacement dynamics of the structural components, before forming an opinion regarding speed as a contributing factor.

In order to form an accurate opinion, it is imperative to differentiate between cosmetic damage such as plastic and plates, and damage that affects the stronger or stiffer structures or even the superstructure of the vehicle. This requires an assessment of the total damage profile and the prevailing structural displacement dynamics. However, there are instances, such as the case involving Minister Collins Chabane, where the damage is so severe that attributing any factor other than speed is all but impossible.

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In the specific case of the vehicle transporting Minister Collins Chabane, the superstructure has undergone complete displacement, with even the Right Rear Wheel experiencing significant impact against the Right Rear Wheel Arch resulting in severe deformation of the Right Rear Door Sill and Wheel Arch, located farthest from the primary collision contact face. Additionally, all vertical structures around the doors have suffered total rearward displacement, indicating both severe primary contact damage and severe structural referral damage caused by natural deformation of the vehicle. Such damage characteristics make it exceedingly challenging to exclude speed as a possible factor.

## Brake marks and speeding



When analyzing brake marks, it is important to exercise caution as they can be misleading on their own. Skid marks are commonly used in a "skid-to-stop" formula to calculate the speed of a vehicle, which assumes the distance a car would skid to where it comes to a stop (without hitting anything) as a starting point. However, this can be problematic, as a vehicle approaching a solid concrete wall at 200 km/h and applying brakes with full and maximum application only 5m from the wall would result in a 5m brake mark with excessive damages.

Instead, the degree of brake application or wheel lock-up and the "drag factor" of the road surface should be considered. The drag factor is an expressed value of the roughness of the road surface, which varies for different surfaces and should be measured using a drag sledge or exemplary vehicle and an accelerometer. Once the possible range of drag factors has been considered or measured, the speed calculations can be started, taking into account the wheel lock-up evidence.

It should be noted that not all cars that brake hard will skid, with some equipped with anti-lock braking systems (ABS) or lighter at the rear and leaving a set of skid marks from the rear tires dragging rather than the front. For a more reliable speed analysis, a 4-wheel lock-up would be the ideal starting point. If only some wheels lock up and skid, a different formula needs to be used to calculate the true drag factor or braking coefficient, taking into consideration the number of wheels that locked or rolled freely.

Only after considering all of these factors, and possibly others, can assumptions or conclusions about speed be made from skid marks.

## Photographs and assumptions



When using photographs as a basis for making assumptions about speed, various factors observed can imply different minimum speeds. For instance, modern vehicles are typically designed to withstand minor impacts of up to approximately 20 Km/h. Therefore, if the bumpers are damaged, it can be inferred that the speed at the time of impact was likely greater than this threshold.

In general, airbags in most vehicles will not deploy to their full extent unless adequate forces are generated. These forces are typically generated at speeds of 24-30 Km/h or higher, although this can vary depending on the vehicle and other factors. Therefore, if an airbag has deployed to stage 1, this is an indication that the speed of the vehicle at impact was likely higher than this minimum threshold.

When assessing the speed of a vehicle from photographs, one approach is to examine the structural

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damage sustained by the vehicle. Typically, when the bonnet, front axle, or engine are displaced, and airbags have deployed, the speed of impact is estimated to be approximately 60 Km/h. Above this speed, roof damage may also be observed. While this is a general guideline, it can serve as a useful method for quickly estimating the impact speed. Another common method used is the "one mile per hour per one inch of crush" rule, which provides a rough estimate of speed based on the extent of crush damage observed.

The make and model of a vehicle, as well as the extent of damages sustained, are also important factors to consider when assessing potential speeds from photographs. For instance, modern Volvo vehicles are equipped with A-pillars reinforced with boron steel inserts, which are highly resilient. In cases where damage to the A-pillar is visible, it is reasonable to assume that excessive forces were exerted, possibly indicating speeds exceeding 80 Km/h.

Through an understanding of vehicle design, the structural strength of its components, potential failure points of different sections of the superstructure, and design considerations and safety systems, it is possible to draw conclusions regarding the speed of impact from photographs alone.

### **Relevant components for speed estimation**



When conducting crash analysis, it is often advantageous to work in reverse. An analysis of a vehicle's speed may begin by examining the distance it traveled from its final resting position to the point or area of collision, and the prevailing dynamics during that movement, such as roll-over or rotation. The medium of the collision must also be considered, taking into account the object's hardness or narrowness. For example, collisions with utility poles, trees, concrete walls, and other vehicles may require different models of analysis.

Another aspect to consider is the damage sustained by the vehicle. The width and depth of the damage, or crush, can be compared to research values obtained through controlled crash measurements, expressed as A, B, and Z stiffness values. These values provide insight into the amount of energy required to cause a specific amount of damage to a vehicle. By determining the amount of energy converted during a collision, one can estimate the possible speed (as a function of a change in velocity)

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at which the collision occurred.

The pre-collision speed, such as skid-lines, can also be considered. By isolating and analyzing these different components of speed, one can arrive at a conclusion regarding the possible (often minimum) speed of the vehicle.

Moreover, modern innovations such as black boxes, Airbag Controller Units, Vehicle Telemetry and Tracking Systems, Tachograph Charts, In-vehicle Cameras, and GPS units can be used to determine speed with a high degree of accuracy.

## Vehicle types and makes



As previously mentioned, the manufacturer's design philosophies and the mechanisms and systems integrated into their vehicles can greatly impact the conclusions drawn from factors such as damages, airbag deployment, and battery cable clipping (where some vehicles have systems that will cut a battery in severe collisions). It is important to note that not all vehicles are built equally. For instance, the Smart Car is designed to be so hard (referred to as an occupant protection shell) due to its small size that it would activate the crumple zones on another vehicle it collides with, rather than relying solely on its own. Therefore, when analyzing collisions involving Smart Cars, this unique design feature must be taken into account.

## **Crash Type Considerations**



When analyzing collisions, those occurring at approaching 90 degrees are typically evaluated using the "360-degree method." However, head-tail and head-on collisions cannot be reliably assessed with the same model. In cases where a vehicle rolls over, the trip mechanism and the specifics of the roll (i.e., number of rolls, continuous or skidded, damage extent) become crucial factors in the analysis.

The most challenging collisions to analyze are those with a significant difference in mass and size between the involved vehicles. For instance, collisions between a 50-ton truck and a 1-ton car require careful consideration due to the negligible influence the smaller vehicle has on the relative motion and movements of the larger truck. Standard models may not suffice for analyzing such collisions.

## **CCTV Evidence**



The protocol I designed comprises 124 points and is specifically tailored for the investigation of road traffic collisions, both at the scene and post-event. One of the specific points of consideration in this protocol involves the use of CCTV footage as a potential source of evidence. In my experience, I have encountered cases where the at-scene investigation was insufficient in yielding evidence, and the only available source of information was obtained through video footage from CCTV cameras situated in various locations such as fuel stations, municipal areas, highways, and shopping malls. However, it is essential to note that most CCTV systems only record footage for a limited period. As a result, investigators must include efforts to locate and review CCTV footage in their at-scene investigation protocol to maximize the chances of obtaining relevant evidence. An exemplary case demonstrating the use of external video footage is the Pinetown Truck crash, which was captured by another in-vehicle recorder.

# **INSURANCE CLAIM REPUDIATION**

Insurance brokers are more than just specialists in cost reduction. A competent broker develops a strong and long-lasting relationship with their clients, providing advice that is beneficial in both the short and long term. When it comes to the preparation, submission, and motivation of claims, brokers are the go-to resource for their clients, relying on their experience, expertise, insider awareness, and direct lines of access.

When a broker submits a claim to an insurer on behalf of their client, they typically expect the claims process to proceed according to their long-term experience. However, if the claims process is changing, or if there is an increase in insurance repudiations, brokers must adapt to these changes to best advise, assist, and represent their clients.

Clients who experience unfairly repudiated claims can become disenfranchised with their insurer, feel cheated, exploited, or abused, and develop anger towards the insurance industry. They often turn to their broker for assistance, intervention, or representation. Brokers must be prepared to help their clients navigate the claims process in these situations, providing support and guidance through the resolution of their claims.

## When Things Get Technical

If a repudiation is administrative, such as when premiums have not been paid or if a particular type of loss claim is not covered under the policy, brokers may have limited tools to assist their clients beyond advising on the content and meaning of the policy terms. However, when repudiations become technical, brokers face more significant challenges in assisting their clients.

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In motor vehicle collision cases, repudiations often center around issues that go beyond policy wording, interpretation, or coverage. These issues may involve the interpretation of the merits of the claim, such as whether the client was truthful during the claim, took reasonable steps to reduce risk, operated a roadworthy vehicle, exceeded the speed limit, or acted in a reckless or negligent manner.

In these situations, brokers must possess a deep understanding of the technical aspects of the claims process to assist their clients effectively. They may need to engage experts or specialists in specific areas to help support their clients' claims and provide additional evidence to support their case. Brokers must also be skilled negotiators, able to advocate for their clients' interests and negotiate with insurers to reach a satisfactory outcome.

## **Rising Insurance Repudiations**



As a seasoned industry professional with over two decades of experience, I have observed a concerning trend in recent years. Specifically, I have noticed a significant increase in the number of clients approaching us due to insurance claim repudiations, particularly within the last four years. This trend is especially troubling as many of these repudiations seem to be for reasons that we consider to be completely irrational.

I have had the privilege of working with some of the biggest names in the insurance industry in South Africa, including Mutual & Federal, Santam, Auto & General, SA Underwriters, Palladin, Trucksure, AIG, Aon, and One Insurance, among others. Throughout my tenure in this field, I have consistently heard that repudiation is considered a last resort for insurers, with many of them emphasizing their commitment to paying claims, rather than denying them. However, this trend has changed significantly in recent years.

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Beginning around 2017, there was a sudden surge in repudiations that left many of our clients feeling frustrated and helpless. Oftentimes, these repudiations occurred only after the engagement of an expert who produced a report framing the claimant as a violator of their policy terms. While some argue that this increase in repudiations is due to the use of experts, which has highlighted the prevalence of false or fraudulent claims, others believe that certain experts may be finding in favor of repudiation in exchange for more work or a longer-term income stream.

Regardless of the reasons behind this trend, the fact remains that claims are being repudiated at a much higher rate than before. As an industry professional, I am deeply concerned by this development and believe that it is imperative for insurers to reassess their policies and practices to ensure that they are not unfairly denying claims that should be paid.

#### **Expert Reports in Repudiations**



As a crash expert with extensive experience in insurance claim repudiations, I have encountered numerous cases where I am unable to provide a thorough analysis of the expert report that formed the basis of the repudiation. Often, these reports lack critical information such as additional evidence, methods used, and measurements, or they may only contain a few photographs of poor quality that are insufficient for proper analysis.

When we request proper copies of all evidence and photographs, insurers frequently refuse to supply them, even during the complaint process with the Ombudsman for Short-Term Insurance (OSTI). It is essential for insurers to understand that without access to the same evidence that the expert relied on to form their opinion, I cannot adequately review their findings. If an expert took 100 photographs, but only a small fraction of them are included in their report, I may not have the necessary information to fully understand their conclusions.

Refusing to disclose evidence is not only frustrating for clients seeking to challenge repudiations, but it may also interfere with my ability to potentially agree with the insurer's expert. Furthermore, any delays resulting from a lack of disclosure only serve to prolong the process and create additional frustration for all parties involved.

Given that experts are objective analysts of physical evidence, and are typically required to appear in trials to assist the court, it would be reasonable to assume that an open-door policy exists that allows both parties to share all physical evidence. However, this is hardly ever the case.

In conclusion, it is crucial for insurers to provide full access to all evidence and photographs related to an insurance claim, particularly when an expert report is involved. Such transparency is not only in the best interest of the client but also promotes fairness and efficiency in the insurance claim process.

#### The role of Brokers

It is not uncommon for insurance clients to inadvertently expose themselves to the risk of repudiation by submitting claims without adequate consideration of the specific policy wording. Vague or inaccurate information in a claim can prime the insurer for repudiation, which may result in significant delays and frustrations for the client. As the more knowledgeable party in the relationship, brokers should take the time to interpret the policy wording and guide their clients on the importance of providing accurate and detailed information in their claims.

A recent case we encountered involved a client who was involved in a collision with a third party. The client, the third party, and an attending police officer all provided the same account of the event: the third party had swerved to avoid a pedestrian and collided with our client's vehicle on their side of the road. However, when the client submitted their insurance claim and described the event as a head-on collision, the insurer rejected the claim on the grounds of fraud.

The insurer's expert argued that the damages sustained by the vehicles were inconsistent with a headon collision. The client, who was not a crash specialist, had used the term "head-on collision" based on the fact that the vehicles were moving in opposite directions when the collision occurred. The insurer's accusation of fraud and subsequent repudiation highlights the importance of clear and accurate communication in insurance claims.

As an industry professional, I have observed an increasing trend towards overly strict interpretations of policy wording, resulting in more frequent cases of repudiation. In such instances, providing opposing analysis reports and resorting to legal action can be a lengthy and frustrating process for all parties involved.



Insurance brokers have the potential to prevent their clients from experiencing unfair or unjust repudiation by proactively helping them avoid it. Collaboration with professionals such as myself can lead to the creation of informative material, such as information packets, short videos, or email campaigns, to educate clients about the challenges they may face when submitting claims or encountering unnecessary repudiations. South Africa has a poor road safety record, with hundreds of thousands of crashes occurring annually, making it irresponsible to drive an uninsured vehicle. While car insurance may be considered a "grudge purchase," it can prevent lengthy legal battles with other road users and provide peace of mind that the cost of replacing a vehicle will not result in financial hardship. However, fulfilling contractual obligations is critical for preventing insurers from being burdened with limitless liability. Insurers only pay for damages that could be foreseen, not damages resulting from lawlessness such as drunk or reckless driving. When an insured vehicle owner submits a claim, insurers investigate the reason for the claim, the factors contributing to the crash, and whether the client breached the contract, which could lead to repudiation.

#### Justification for repudiation

As an experienced professional in the Road Traffic Risk Analysis and Crash Investigation and Reconstruction industry for over two decades, I have observed a noticeable shift towards the frequent repudiation of insurance claims for various reasons. While in the past, extreme negligence or alcoholic intoxication were the primary reasons for repudiation, these days, clients are reporting horror stories of their claims being rejected for seemingly trivial reasons.

In such instances, crash investigators may assist in uncovering the facts that could ensure a fair and just treatment of the claim. However, it is important to note that investigators may have a vested interest in presenting facts that favor the insurer paying them, which could lead to further appointments for the investigator. Therefore, it is essential to balance their findings with those of other independent crash investigators to ensure a fair assessment of the claim.

Clients have approached me with increasing frequency, often several times a week, seeking my assistance in resolving their insurance claim repudiation matters. Interestingly, most of these cases are related to speed. Typically, the insurer appoints an investigator, who concludes that the client was driving at an excessive speed, leading to the rejection of the claim on the grounds of negligence or recklessness. This is considered a material breach of the client's duties to prevent loss or risk.

As a professional, I empathize with clients who have been unfairly treated in this manner. It is crucial to consider all the facts and evidence to dispute the findings of the insurer's investigator if you believe you were not speeding. Such cases require careful handling, and clients must seek the assistance of experienced professionals who can provide sound advice and guidance throughout the claims process.

## Case Example 1



In a particular instance, a client's spouse was involved in a vehicular collision with a BMW M6 amidst a severe rainstorm. Upon contacting the insurance company to register the claim, the client was informed of the costly nature of the involved vehicle, and that a thorough investigation would be conducted before the claim's settlement. Subsequently, an investigation was executed, leading to the compilation of an Expert Report, and ultimately, the repudiation of the claim on the grounds of speed and due care.

If an insurance claim is repudiated, one has the right to seek recourse through the Ombudsman for Short-Term Insurance (OSTI), as was done in the present case. The client lodged a complaint, and the OSTI provided the insurer with 30 days to respond. The insurer's response consisted of an "Expert Report," which included investigative work, such as measurements and photographs, as well as a mathematical speed calculation. This calculation was used to support the claim that the client's vehicle was being driven at an excessive speed, thereby justifying the repudiation of the claim.

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The client was subsequently informed that the claim would not be paid.

Upon receipt of the OSTI's response, the client was granted a period of seven days to respond. As part of her response, the client was required to retain the services of an expert to investigate the matter, which involved making payment to the expert and scheduling an investigation. The expert was required to visit the scene, examine the vehicle, consider the evidence, review the insurer's Expert Report, and compile a comprehensive report with comments, all within the prescribed seven-day timeframe. Given the tight deadline, the client anticipated challenges in meeting these requirements and thus requested an extension. However, only a two-day extension was granted.

At this point, my involvement in the matter began. Upon reviewing the insurer's Expert Report, I observed several irregularities and discrepancies. Despite the time constraints, I promptly visited the scene and inspected the vehicle. Given the lack of reference information provided in the insurer's Expert Report, I formulated a list of pertinent questions that the insurer's expert needed to answer. The answers to these questions were necessary to compile an accurate answering report for submission to the OSTI for consideration.

Upon submission of the list to the Insurer, the Expert Report was accompanied by a subsequent report that acknowledged errors in the initial report. However, the report still maintained that the driver was traveling at a speed beyond what was deemed reasonable. The initial questions posed were left unaddressed, prompting the formulation and transmission of a second set of inquiries to the Insurer through the Office of the Ombud Service for Life and Health Insurance (OSTI).

Subsequently, the insurer inadvertently included the client in an internal email where a "connection" was mentioned as a possible candidate to produce a second report for the insurer. The appointed "connection" was tasked with examining the vehicle and compiling a new report.

After several weeks, the insurer received the third report, which left more questions than answers. Upon review, multiple irregularities and what appeared to be fraudulent references were identified in the "connection's" report.

Upon submission of a fresh set of inquiries to the OSTI, the responses provided failed to offer satisfactory resolution. Consequently, the OSTI deemed the case "closed" and withdrew from the matter. Despite the reports remaining unjustified to date, the client's claim remains unsettled. A new application is underway to resubmit to the OSTI, accompanied by a comprehensive and detailed report, aimed at facilitating a resolution. Furthermore, the client is exploring the possibility of instituting legal proceedings against the insurer and the experts involved in investigating the collision.

Additionally, it is pertinent to note that as per the OSTI's regulations, if the client retains legal representation at any point, and subsequently initiates legal action against the insurer, the OSTI will withdraw from the case.
#### Case Example 2

In a separate case dating back to 2014, a client was driving her vehicle in a densely populated area in downtown Pretoria when she claimed that another vehicle had intruded into her lane. As a result, she had to veer off the road to avoid a collision, eventually colliding with a wall.

### 7. Velocity calculations:

We were able to calculate the pre impact velocity of the insured vehicle based upon the distance the vehicle skidded and the severity of the damage we analysed by using a basic motion equation.

 $vi = \sqrt{ve^2 - 2ad}$  $vi = \sqrt{(27.777^2) - 2(-7.848)(14)}$ 

vi = 31.485m/s

This means that the insured was travelling at a speed of between 110-120km/h when the vehicle mounted the curb.

The insurer in the aforementioned case also engaged an expert who conducted a speed calculation using a single formula and concluded that the client was driving at an excessive speed, despite the client's defense. Similar to the previously discussed case, the client sought legal representation, and during the trial, was left to bear the burden of paying for the written-off car, the new replacement vehicle, the associated insurance, and all the legal and expert fees. This has resulted in the client incurring expenses far exceeding the initial cost of the car. All of this arose from the insurer's repudiation of the claim based solely on the results of a single speed calculation.

In addition to the aforementioned issues, I had some additional concerns that arose from the influx of repudiation cases. Specifically, I began to observe that the same experts were involved in a majority of these cases, and they consistently arrived at the conclusion of excessive speeding. It is notable that regardless of the manner in which the vehicle left the road, such as a single-vehicle collision, rollover,

collision with a wall, embankment or fence, these experts used the same formula repeatedly. The issue has now escalated to a point where other experts in our industry have expressed similar concerns and shared my view that speed has become the primary factor behind the repudiation of insurance motor claims.

My own experience is that I am currently receiving an average of two new repudiation cases per week, and other experts have reported having as many as 50 similar cases on their desks. These cases are all being handled by the same experts who have been appointed by different insurers, and they are all using the same single formula to determine excessive speeding. Moreover, they appear to be overlooking basic laws of physics and neglecting proper evidence collection protocols. Additionally, they are ignoring internationally recognized reference tables and relying on assumptions that are typically biased toward high-speed determinations. It is evident that a concerning trend has emerged, and I am deeply troubled by it.

I have observed a particular formula that is consistently being used by the same experts in the aforementioned repudiation cases. I have even taken the step of issuing a Twitter post warning people that if they come across this formula in an expert report, there is a high probability that the results have been intentionally skewed against them or are entirely inaccurate.

$$vi = \sqrt{ve^2 - 2ad}$$

I am able to substantiate my aforementioned opinion with an extensive collection of references. With my vast library of hundreds of books on crash investigation and physics, I can readily locate the formula

in question and its relevance in the field of crash investigation. Although I only need to reference one example, many other similar formulas exist. Furthermore, I possess a copy of the Accident Reconstruction Manual from Northwestern University, the very institution that the experts I encounter claim to have received their training and qualifications from. On page 71 of the manual, the formula appears in the section on **Basic Motion Equations**. The manual, which exceeds 700 pages, emphasizes that the use of only these 12 equations serves to reduce the confusion commonly experienced by novice students. This explains why I have concerns regarding the results derived from this single equation or other similar formulas.

As a professional in the field of crash investigation, I am troubled by the possibility that experts who have received training from institutions such as Northwestern University may not have read and fully understood the contents of the Accident Reconstruction Manual. This manual contains important information that is relevant to the use of formulas such as the one in question.

It is crucial to understand that the formula in question is subject to accurate input values. One cannot arbitrarily plug in values that yield desired results. The formula is designed to calculate an initial velocity when the end velocity, distance, and deceleration rates are known. It is important to note that these values should be known, not assumed or guessed.

To fully comprehend the significance of this formula, it is necessary to consider each element carefully. By doing so, we can ensure that the calculations are accurate and that the results are reliable.



To illustrate the concept of resistance to forward motion, consider this example with a car. When the car is moved across a table, you can observe that it moves in a straight line and the wheels roll freely. However, there is some resistance to forward motion, albeit minimal. If the wheels of the car are locked, either one or all four, and the car is pushed and released, it will come to a stop quickly due to the added braking action.

In the context of crash investigation, it is important to understand the principles of deceleration and how it can affect the calculation of speed. Consider the following scenario: imagine a car moving in a straight line across a table. As the wheels are rolling freely, there is minimal resistance to its forward motion. However, if the wheels are locked - for instance, by placing some tape over one or all of them and the car is pushed and released, it will come to a stop much more quickly due to the added braking action. If we know the distance the car travelled and the speed at which it came to a stop, we can use the deceleration rate to calculate its initial speed when it was pushed. This is a crucial consideration when it comes to determining the speed of a vehicle involved in a collision. By accurately measuring the distance travelled and the deceleration rate, we can make a more informed calculation of the vehicle's initial speed, rather than relying on assumptions or biases.

The formula is designed to calculate the Initial Velocity of a moving object, given that the End Velocity, Distance, and Deceleration Rate are known. However, it is important to note that this calculation is only accurate if the aforementioned values are precise and not based on assumptions. For instance, the End Velocity is typically zero if the object comes to a stop. It is also critical to know exactly how many wheels are locked or how much resistance is present through friction, as this can impact the deceleration rate. Finally, an accurate measurement of the distance over which the object decelerates is necessary for precise calculations.

Despite the formula's apparent simplicity, it is essential to note that accurate input values are critical for precise results.

Let us begin by breaking down this matter piece by piece. Firstly, let us examine the one aspect that we should all be able to come to an agreement on - the distance over which the car decelerated. This distance is measured along the path of the vehicle's motion. However, it is important to bear in mind that we were not present at the time of the collision, unlike the example of me pushing a car on a desk. As a result, we must rely on clues to determine the distance over which the vehicle decelerated. In the absence of such clues, it is impossible to determine the distance accurately.

Skid marks can provide a useful clue in determining the distance over which a vehicle decelerated. By measuring the distance between the starting point and the end point of the skid marks left by a car,

which was clearly braking, we can estimate the distance over which the car decelerated. However, it is important to take into account additional factors such as the wheelbase of the car and which wheels locked up. Nevertheless, using skid marks as a starting point can simplify the process of determining the distance over which a vehicle decelerated.

In analyzing a motor vehicle's braking behavior, it is important to note that the vehicle typically has four wheels, and various conditions may result when the driver applies the brakes. Depending on which wheels lock up and to what extent, there may be one to four different tire marks of varying length, some of which may overlap. Additionally, some wheels may only lock up for part of the distance over which the vehicle decelerates. Moreover, the presence and length of skid marks can be affected by factors such as the use of ABS and the amount of braking effort applied. In some cases, there may be no marks at all if the driver does not brake or only applies limited braking effort. It is also possible for the driver to initially apply brakes, but later realize that they will not stop in time, and then apply more force, resulting in partial locking up of the wheels.

When a vehicle skids over multiple surfaces, the distance over which it decelerates is no longer a simple matter to determine. Let's take an example where a vehicle leaves the road surface and skids over gravel and grass. The surface over which the vehicle skids can impact the frictional force between the tire and the ground and, in turn, the distance over which the vehicle decelerates.

Thus, determining the total distance over which the vehicle decelerated can be challenging in such scenarios. Factors such as the type and condition of the surfaces, the speed and weight of the vehicle, and the road and weather conditions can all impact the distance over which the vehicle decelerates. Therefore, a comprehensive assessment of the evidence and expert analysis is required to determine the distance over which a vehicle moved while decelerating in such situations.



Exhibit 25. This diagram of skid marks on two surfaces is used to illustrate a method of dividing the total distance into sections to estimate the initial speed more accurately.

When a vehicle skids over multiple surfaces, it cannot be considered a single distance. Although it is common for expert reports to use a single formula to calculate the distance, it is not accurate in such cases. The Northwestern Manual provides an example on page 158 that illustrates this issue. The example discusses a scenario where a vehicle decelerates over two different surfaces. In such cases, it is important to take into account the different coefficients of friction for each surface and calculate the distances separately. This approach will provide a more accurate calculation of the total stopping distance of the vehicle.

In the context of speed determination, measuring the distance traveled by a vehicle cannot be done as a single value when the vehicle has moved over different surfaces during deceleration. This is because the deceleration of the vehicle will be different depending on the surface, for example, when all four tires are sliding on tar versus when only one is on gravel or when two are on grass. Therefore, to properly use the formula for speed determination, each relevant distance must be measured individually, with the vehicle's center of mass serving as the point of reference. Unfortunately, many expert reports overlook this crucial aspect, leading to a simplistic understanding of the formula's applicability. In reality, determining speed from skid marks is a complex process that requires careful consideration of all relevant factors.

In vehicle collision investigation and reconstruction, the concept of Drag Factor plays an important role Get certified in at-scene Road Traffic Collision Investigation – visit <u>https://bit.ly/ibfprotocol</u>

in determining the deceleration of the vehicle. This term is not commonly found in engineering mechanics or physics books, but is specifically used in this field. The Drag Factor is defined as the force required for acceleration or deceleration in the direction of the acceleration or deceleration, divided by the weight of the object or vehicle. Essentially, it tells us how much of the vehicle's weight is needed to move it across a particular surface. This factor is an essential component in calculating the deceleration of a vehicle, which in turn helps determine the speed at the time of collision. It is important to note that the Drag Factor is specific to the surface that the vehicle is traveling on and must be determined through testing or referencing established tables.

To properly calculate deceleration, we must determine the appropriate drag factor for a particular surface. For example, if a car weighing 1000 Kg requires 800 Kg to be dragged across a surface, the Drag Factor can be described as 1000/800 or 0.8. This means that 80% of the car's weight is needed to move it across the surface. The deceleration rate can then be calculated based on the drag factor. It's important to note that drag factor is not a standard term used in engineering mechanics or physics books, but it is a widely used term in traffic collision investigation/reconstruction.

Now - in order for us to determine the deceleration value to use in the formula, we need to accurately determine the Drag Factor. This is where we find most expert reports lacking the most. They grab a single value of (say) o.8 and calculate the deceleration value, based on this.

But now we need to be very careful: When it comes to determining the Drag Factor, even experienced experts often make mistakes. Consider the example of a car. If we were to lock all the wheels and push it across a surface, we would feel that it requires more force than when the wheels are rolling. However, if we lock only three, two, or one wheel, we will find that it becomes progressively easier to push. Additionally, if we were to push the car on different surfaces such as glass, wood, sandpaper, or rubber, we would find that the force required to push the car varies.

It is concerning that some individuals who claim expertise in crash reconstruction still rely on a single drag factor, which is then converted to a deceleration rate, even when a vehicle moves over multiple surfaces and there is no evidence to determine whether the wheels were locked or free-rolling. This oversimplification of the process can lead to inaccurate calculations and potentially flawed conclusions. It is crucial for experts in this field to conduct a thorough investigation, accurately determine the drag factor for each surface, and carefully consider all available evidence before making any conclusions.

It is important to note that one possible reason experts in crash reconstruction may use a single drag factor, even when the car moves over several surfaces and there is no evidence to determine whether one, two, three, or all four wheels were locked or free rolling, is that they may be focused on reducing the total braking result in order to lower the calculated speed. However, it is crucial to consider the evidence properly and admit that no evidence means no braking, resulting in the lowest possible values. Using a drag factor of o.8 for a car that moved over wet tar, onto gravel, and onto wet grass without considering the number of wheels actually skidding may result in a much higher speed calculation compared to considering each surface individually and admitting the uncertainty of whether all four wheels were in a locked (maximum braking) state or not.

The determination of the Drag Factor is a complex and nuanced process, as it is affected by various factors such as the type and condition of the road surface, as well as the speed of the vehicle. It should be noted that the Drag Factor can vary depending on whether the surface is wet or dry, and even on the direction of movement. For instance, the Drag Factor for newly laid asphalt can be different from traffic-polished or tar-exposed asphalt.

Furthermore, the Drag Factor is not a static value, as it can change depending on the speed of the vehicle. When a vehicle brakes at 30 km/h, for example, the Drag Factor is higher than if it were travelling at 100 km/h and brakes. It is therefore clear that a single value cannot be used to accurately calculate deceleration and speed, especially given that road conditions can change over time.

To obtain an accurate Drag Factor, one must conduct a series of tests on the road surface, in the same direction in which the vehicle was moving, immediately after the collision. It is essential to consider these nuances and factors when determining the Drag Factor and subsequent deceleration rate to ensure the accuracy of the final calculation.

The Society of Automotive Engineers has published a paper, referenced as SAE 830621, which provides guidance on the various conditions and variables that should be taken into account during collision analysis involving drag factors. The paper extensively describes the different types of surfaces that investigators commonly encounter, under various conditions and speeds, and even considers the types of vehicles involved. However, it does not rely on a single value but instead provides a range of values for each surface type.

In cases where on-site testing cannot be performed, a range of potential values will be provided to account for any possible errors or variations, and to facilitate the production of reliable and precise results.



In order for the speed determination using the discussed single formula to be reliable, a specific set of criteria must be met. These include:

- Accurate determination of the total distance the vehicle moves based on visible tire marks from beginning to end.
- 2. The vehicle should skid on only one surface from beginning to end.
- 3. The vehicle should come to a stop on that one surface without hitting anything or sustaining significant damage.
- 4. The marks used to measure the distance must be verified as belonging to the vehicle under consideration, possibly through tire or track measurements.
- 5. The Drag Factor for the surface should be determined through testing, or a range of values based on research papers should be used (typically two values), instead of being estimated to be as high as possible.

and should be supplemented by a series of additional calculations for a variety of different surfaces, dynamics, or damages:

- 1. If the vehicle travels over multiple surfaces.
- 2. If the vehicle collides with another object or does not come to a stop naturally.
- If there is no clear visible evidence of the vehicle's movement along with the full distance of consideration.
- If the vehicle is not moving in a straight line, such as when it is in yaw (spinning out of control) or rolling over.
- 5. If there is no way to determine exactly what the driver was doing, such as braking versus accelerating or doing nothing.
- 6. If the tyre marks cannot be conclusively linked to the involved vehicle or even the specific wheel or wheels of the vehicle.

It has been observed that the single formula method is frequently employed in cases where the dynamics of the collision are too intricate to be simplified through this approach. Complex dynamics events such as rollovers, skidding over multiple surfaces, or collisions with other vehicles or fixed objects cannot be accurately assessed using only this one formula. If the collision under investigation involves any of these complex dynamics, but the report solely relies on this simple formula, it can be inferred that the method employed is not suitable for the model, and the resultant conclusions will likely be biased and, in most cases, not in favor of the party concerned.

What could you do, if your vehicle accident claim was repudiated because of a finding that you were speeding excessively and therefore not taking due care or taking steps to avoid or minimize risk? Here is some advice:

#### **Repudiation Advice**

Consider your options carefully if your vehicle accident claim has been repudiated due to excessive speeding. If you decide to use the services of the Ombudsman for Short-term Insurance (OSTI), ensure that you request a copy of the full report used to determine your speed. Keep in mind that you may need to engage an opposing expert, as the OSTI may not accept you as an expert in your own case. It is ideal to have your expert assist you with the preparation of your OSTI submission. Once the submission is made, the insurer will have 30 days to respond. If the insurer provides an expert report, you will need to appoint your own expert to proceed further. While this route may incur costs for the expert, the OSTI process typically concludes within a month or two, with their final decision carrying weight and resulting in either the settlement of your claim or the receipt of a response in a reasonable timeframe. If you remain dissatisfied, you may choose to pursue legal action.

If you opt for the legal route, it is important to be aware that it may involve hiring lawyers or advocates and paying them in advance. Additionally, the burden of proof will be on you to demonstrate your case, while the insurer may not be required to prove anything. It is also important to note that it could take up to two years to secure a court date, and if you are unsuccessful in your claim, you may be responsible for covering the insurer's legal fees. Consider these factors carefully before deciding whether to pursue the legal route.

Consider engaging an expert as soon as there is any indication of a dispute, regardless of whether the claim has been repudiated or not. The expert can visit the accident scene to gather evidence, photographs, and measurements, as well as examine your vehicle, before any potential evidence is lost. This early intervention can help to ensure that your case is built on a strong foundation, and could potentially increase your chances of success in any future legal or insurance proceedings.

Consider seeking legal advice if your insurer repudiates your claim after a prolonged period of arguments, as you may be left with only the evidence provided by the insurer to prove your case. It is important to act quickly to gather evidence and build a strong case with the assistance of an expert in the field to support your claim. Delaying action can result in the loss of crucial evidence and hinder the possibility of a favorable outcome in your case.

As a prudent step, it is recommended to hire an expert to gather the most important evidence after an accident or to receive basic accident investigation training to be prepared for such situations. Even though it may cost you some money to hire an expert, not having the best evidence puts you at an immediate disadvantage when you refer your case to either the OSTI or start a civil claim. Investing in an accident training manual or basic accident investigation training before you need it can help you gather evidence effectively and save you money in the long run.

# **UNDERSTANDING BRAKE FAILURE**

#### Truck vs Passenger Brake Systems

The most important difference between "car" and "truck" brakes include the following:

- Car brakes are essentially in a permanent state of non-engagement. There are no brakes until you apply foot pressure. This pressure is amplified by the brake booster (brake system components) and converted into pressure applied via two cylinders to a pair of brake "pads" that clamp down on the brake disk. Essentially, this means that there are no brakes until brakes are actively applied. The car brake system contains a fluid (brake fluid) that is used to transfer pressure from the operator's foot to the brake calipers.
- Truck brakes essentially consist of TWO systems: Park (or Spring) brakes and Service (or Foot) brakes. The truck brake system has a cylinder that contains a strong spring and a vacuum chamber (booster). This is connected to a pushrod which is, in turn, connected to an arm (slack adjuster) which twists a shaft with a cam (S-Cam on it). The S-Cam causes two brake SHOES to expand (open up) and contact with the inside of a brake drum. So, a truck brake system would be permanently ENGAGED if there was no external influence. A truck brake system works with a vacuum. If there is NO VACUUM, the springs would actuate the pushrod, which will lever the slack adjuster, turning the S-cam (shaft), engaging the brakes. When vacuum is applied, the pushrod (end) is "sucked back" and then the brakes are released. Then every time a driver tries to "break" the vacuum would be released, and the brakes would be applied. You can "essentially," say that the truck brake system (air brakes) work in "reverse" to car brakes.

#### What are "failed brakes?"

In the case of car brakes, this could mean several things, including:

- There is a "leak" in the brake pipes, causing brake fluid to escape (leak out) and this would mean that there is no longer enough fluid to transfer pressure.
- Seals could damage, resulting in some of the pressure "Escaping," reducing brake efficiency.
- The brake linings (brake pads) could become worn, requiring more and more pedal actuation to engage brakes.
- Brakes could overheat, resulting in poor brakes or even the brake fluid boiling or breaking down and reducing brake efficiency.

In the case of air brakes, it gets a bit more complicated. The following things can lead to a "failure:"

- If there is ANY fault (leak) on the vacuum system and the vacuum is lost, the spring brakes will "actuate" and stop the vehicle.
- If there is any fluid leak (bearing grease, etc), the friction surfaces can be compromised (made too slippery) and the vehicle could lose braking efficiency.
- If the Slack Adjuster is not set (or adjusted) properly, the push rod might not be able to push the slack adjuster far enough to result in actuation.
- If a booster is failing, operators sometimes remove the pipes, jacks off the brakes (this can be done) and seal the pipe so that the rest of the brake (boosters) can work; but this can lead to total brake failure due to overheating.
- If the S-Cam turns too far, it can "flip over" and it then stops having any effect on brakes, while "everything looks fine." This is very dangerous and renders the brakes ineffective.

#### Issues with brake failure evidence

One of the most significant challenges regarding brake failure is the process of towing and recovery. When tow companies need to tow a vehicle that has been involved in a collision and the brake system has been compromised, they are required to release all the brakes by "jacking off" the system. As a result, the brake system compresses the spring and releases the wheel brakes. This makes it difficult to effectively assess the original condition of the brakes and can potentially hinder the accuracy of testimony. Moreover, in cases where the truck (horse) is completely destroyed, it becomes challenging to determine the efficiency of the vacuum pump and regulators, leading to the possibility of leaving some components of the brake system unexamined, further reducing the accuracy of the testimony.

#### **Vulnerable Brake Components**

In the case of cars, the components that are most likely to fail and compromise braking efficiency are the brake pads themselves, the master cylinder located near the foot brake that applies initial pressure, and the slave cylinder seals located at the wheels that actuate the caliper. It is worth noting that brake fluid can also degrade over time, leading to a reduction in braking performance.

For air brake systems, the most common causes of failure are slack adjuster angles, vacuum (pressure) regulators, and load sensors that are not set correctly, as well as worn brake linings. It is crucial to regularly maintain and inspect all components of the brake system to ensure they are functioning correctly and to prevent potential brake failure.

Drivers of cars must ALWAYS become alert and have their brakes seen to if:

- The brakes become "spongy."
- The brakes work fine, but "fade" and become less effective at the time (normally after increased use).
- They find that there is a "scraping" sound when they brake.
- The vehicle pulls to either side while they are braking.
- They have to "pump" the brakes to stop.

Drivers of trucks and buses must become alert and report faults when:

- They have to wait too long for the spring brakes to release (after starting up).
- The pressure (or vacuum there is a gauge in most vehicles) fluctuates at times.
- They can hear the brake system "unloading" intermittently while they are driving.
- They smell or see smoke from any wheels or brake system while driving or stopping.
- They are unable to stop effectively at any time.
- Their trailer brakes lock up when they are loaded or partially loaded when they stop.
- They hear any mechanical knocking or banging sounds while driving or braking.

#### Avoiding brake failure

It is recommended that drivers perform regular vehicle testing and checks to ensure that their brake system is in good working order. Any brake system issues should be reported immediately and documented in writing. If a driver experiences any issues with braking, hears unusual sounds, sees any fluids leaking from the wheels, or notices that the brakes are hot (smoking, steaming, etc.), it should be reported and addressed immediately.

#### **Roles of the Accident Investigator**



- We conduct regular technical fleet audits for clients. This having been said, these are NOT (mere) roadworthiness checks.
- We examine a vehicle completely and our evaluation is so strict that we even "fail" new vehicles.
- As crash reconstruction experts, we look not only at the functional elements but also the theoretical/legal ones.
- We look at all items that could, might, would or may (one day) contribute to a collision.
- With our Technical Fleet Audits, we assign a fault gravity value for each element we can predict as a possible cause or factor in COLLISIONS.

We offer a comprehensive technical fleet audit service for our clients, which involves a detailed evaluation and analysis of their vehicles. Our assessment covers all components and elements that could potentially contribute to a collision. The findings are presented in a chart that categorizes faults into four categories based on their severity and urgency: immediate, urgent, serious, and general. The report provides a clear roadmap for prioritizing repairs, with immediate faults requiring urgent attention and the vehicle being taken out of service until the issue is resolved. Urgent faults must be addressed as soon as the vehicle is back in service, while serious faults should be repaired at the next scheduled service. General faults require attention but can be addressed during the next major service.

Our system is highly effective, as demonstrated by the rapid recall and repair of 84 vehicles in just three days by one of our clients. By acting on our recommendations, fleet owners demonstrate a commitment to road safety and can show, in the unfortunate event of a collision, that they have taken every possible step to eliminate all risks.

## **SPEED TABLE**

The table provided below can aid in determining the speed of a vehicle involved in a skid or the stopping distance of a vehicle on a particular surface. To utilize the table, please refer to the following examples:

#### Example 1: What is the speed of a vehicle that skidded 28.5 to stop?

In an incident where a car skidded on a dry tar road and collided with another car turning in front of it, resulting in damage to both vehicles, you have measured the longest skid-mark to be 28.5m. In this scenario, there were 4 skid-marks present. By referring to the table, you can determine the approximate speed of the vehicle before the impact. Simply locate the appropriate surface (in this case, "Dry Tar - Traveled") along the top of the table, and then find the range of the skid-mark measurements that corresponds to the number of skid-marks present (in this case, 4), along the left side. Based on the table, a skid-mark measurement of 28.5m on a dry tar surface with 4 skid-marks present would correspond to a vehicle speed of between 65.3 Km/h (minimum, for 28m) and 76.8 Km/h (maximum, for 29m).

#### Example 2: What is the stopping distance of a vehicle traveling at 100Km/h on a wet road?

To determine the stopping distance of a vehicle traveling at 100 Km/h on a wet road, first refer to the top column of the table for the range of Drag Factors for a vehicle on a wet road (Tar, Traveled, Wet), which falls between 0.45 and 0.70. Then, locate the column for 60 Km/h directly below these extremes and note that the vehicle would skid as far as 53m, assuming full brake lock-up.

However, it is important to note that this is the maximum distance and should not replace proper analysis. The chart can be used to make basic determinations and different scenarios can be explored.

### SPEED FROM SKID (FULL BRAKE LOCK-UP)

													Tar, New, Sharp, Dry				
s						Tar, Travelled, Dry											
ter						Tar, New, Wet											
me						Tar, Travelled Wet											
ein													Ceme	nt, Nev	v, Dry		
anc							Cem	ent, Tra	avelled	, Dry							
Dist						Ceme	ent, Tra	velled,	Wet								
kid				Grass	Grass, Dry												
S			Grass	, Wet				1									
	0.25	0.30	0.35	0.45	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00	
10	25.2	27.6	29.8	33.8	33.8	35.6	37.4	39.0	40.6	42.2	43.6	45.1	46.5	47.8	49.1	50.4	
15	30.9	33.8	36.5	41.4	41.4	43.6	45.8	47.8	49.8	51.6	<b>53.5</b>	55.2	56.9	58.6	60.2	61.7	
20	35.6	39.0	42.2	47.8	47.8	50.4	52.9	55.2	57.5	59.6	61.7	63.7	65.7	67.6	69.5	71.3	
21	36.5	40.0	43.2	49.0	49.0	51.6	54.2	56.6	58.9	<mark>61.1</mark>	63.2	65.3	67.3	69.3	71.2	73.0	
22	37.4	40.9	44.2	50.1	50.1	52.9	55.4	57.9	60.3	62.5	64.7	66.9	68.9	70.9	72.9	74.8	
23	38.2	41.9	45.2	51.3	51.3	54.0	56.7	59.2	61.6	63.9	66.2	68.4	70.5	72.5	74.5	76.4	
24	39.0	42.8	46.2	52.4	52.4	55.2	57.9	60.5	62.9	65.3	67.6	69.8	72.0	74.1	76.1	78.1	
25	39.8	43.6	47.1	53.5	53.5	56.3	59.1	61.7	64.2	66.7	69.0	71.3	73.5	75.6	77.7	79.7	
26	40.6	44.5	48.1	54.5	54.5	57. <mark>5</mark>	60.3	62.9	65.5	68.0	70.4	72.7	74.9	77.1	79.2	81.3	
27	41.4	45.4	49.0	55.6	55.6	58.6	61.4	64.1	66.8	69.3	71.7	74.1	76.3	78.6	80.7	82.8	
28	42.2	46.2	49.9	56.6	56.6	59.6	62.5	65.3	68.0	70.6	73.0	75.4	77.8	80.0	82.2	84.3	
29	42.9	47.0	50.8	57.6	57.6	60.7	63.6	66.5	69.2	71.8	74.3	76.8	79.1	81.4	83.7	85.8	
30	43.6	47.8	51.6	58.6	58.6	61.7	64.7	67.6	70.4	73.0	75.6	78.1	80.5	82.8	85.1	87.3	
31	44.4	48.6	52.5	59.5	59.5	62.7	65.8	68.7	71.5	74.2	76.8	79.4	81.8	84.2	86.5	88.7	
32	45.1	49.4	53.3	60.5	60.5	63.7	66.9	69.8	72.7	75.4	78.1	80.6	83.1	85.5	87.9	90.2	
33	45.8	50.1	54.2	61.4	61.4	64.7	67.9	70.9	73.8	76.6	79.3	81.9	84.4	86.9	89.2	91.6	
34	46.5	50.9	55.0	62.3	62.3	65.7	68.9	72.0	74.9	77.8	80.5	83.1	85.7	88.2	90.6	92.9	
35	47.1	51.6	55.8	63.2	63.2	66.7	69.9	73.0	76.0	78.9	81.7	84.3	86.9	89.4	91.9	94.3	
36	47.8	52.4	56.6	64.1	64.1	67.6	70.9	74.1	77.1	80.0	82.8	85.5	88.2	90.7	93.2	95.6	
37	48.5	53.1	57.4	65.0	65.0	68.5	71.9	75.1	78.2	81.1	84.0	86.7	89.4	92.0	94.5	96.9	
38	49.1	53.8	58.1	65.9	65.9	69.5	72.9	76.1	79.2	82.2	85.1	87.9	90.6	93.2	95.8	98.2	
39	49.8	54.5	58.9	66.8	66.8	70.4	73.8	77.1	80.2	83.3	86.2	89.0	91.8	94.4	97.0	99.5	
40	50.4	55.2	59.6	67.6	67.6	71.3	74.8	78.1	81.3	84.3	87.3	90.2	92.9	95.6	98.2	100.8	
41	51.0	55.9	60.4	68.5	68.5	72.2	75.7	79.0	82.3	85.4	88.4	91.3	94.1	96.8	99.5	102.0	
42	51.6	56.6	61.1	69.3	69.3	73.0	76.6	80.0	83.3	86.4	89.4	92.4	95.2	98.0	100.7	103.3	
43	52.3	57.2	61.8	70.1	70.1	73.9	77.5	81.0	84.3	87.4	90.5	93.5	96.4	99.1	101.9	104.5	
44	52.9	57.9	62.5	70.9	70.9	74.8	78.4	81.9	85.2	88.4	91.6	94.6	97.5	100.3	103.0	105.7	
45	53.5	58.6	63.2	71.7	/1./	75.6	79.3	82.8	86.2	89.4	92.6	95.6	98.6	101.4	104.2	106.9	
40	54.0	59.2	63.9	72.5	72.5	76.4	80.2	83.7	87.1	90.4	93.6	96.7	99.7	102.5	105.4	108.1	
4/	54.6	59.8	64.6	73.3	73.3	77.3	81.0	84.6	88.1	91.4	94.6	97.7	100.7	103.7	106.5	109.3	
40	55.0	61 1	66.0	74.1	74.1	78.1	81.9 7 7	00.0 96.4	89.0	92.4	95.6	98.8	101.8	105.9	107.6	110.4	
50	56.3	61.7	66.7	75.6	75.6	70.9	83.6	87.3	90.9	9/ 3	97.6	100.8	102.9	105.8	100.7	112.7	
51	56.9	62.3	67.3	76.3	76.3	80.5	84.4	88.2	91.8	95.2	98.6	101.8	104.9	108.0	110.9	113.8	
52	57.5	62.9	68.0	77.1	77 1	81.3	85.2	89.0	92.7	96.2	99.5	102.8	106.0	109.0	112.0	114.9	
53	58.0	63.5	68.6	77.8	77.8	82.0	86.0	89.9	93.5	97.1	100.5	103.8	107.0	110.1	113.1	116.0	
54	58.6	64.1	69.3	78.6	78.6	82.8	86.9	90.7	94.4	98.0	101.4	104.8	108.0	111.1	114.1	117.1	
55	59.1	64.7	69.9	79.3	79.3	83.6	87.7	91.6	95.3	98.9	102.4	105.7	109.0	112.1	115.2	118.2	