

# Stages of Research in the Field of Road Accidents

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**ABSTRACT:** Like any on-the-spot investigation, which also applies to criminal offenses, and in the case of the on-site investigation where the road accident occurred, we distinguish two stages: the static and the dynamic stages. With the examination of the place of the deed, especially in this situation, there is an interpenetration between the static phase and the dynamic phase, the methods specific to each phase are often performed at the same time. The intersection of the two phases is the consequence of the many situations that can be found in the road accident, such as: both the vehicle and the driver have remained on site or have recovered; the vehicle is abandoned by the driver on site; the driver responsible for the road accident has left the scene of the accident with the vehicle; the driver left the accident site by abandoning the vehicle involved; the victim leaves the scene of the accident.

**KEYWORDS:** impact, photo, road accident, traces

## Introduction

On-site research is one of the criminal and criminal forensic tactical activities normally carried out at the beginning of the prosecution, for immediate knowledge of the place of the act, the discovery, fixation and removal of the traces created at the occasion of committing the offense, as well as for listening to eyewitnesses, victims or even perpetrators. The on-site research activity is regulated under Art. 192, par. 1, 2 of the New Criminal Procedure Code is the activity ordered by the criminal investigation body and, in the course of the trial, by the court, where a direct finding is necessary for the purposes of determining or clarifying certain circumstances which are important for establishing the truth, and whenever there are suspicions about the death of a person.

## Static Stage

The stage is governed by the principle of remotely observing the entire scenario of the place. An overview of the position of the means and objects is examined, delimiting the required perimeter, but it is not allowed to touch or modify the objects identified on the spot. In order to establish and mark the access road in the perimeter of the offense and the point of exit from its boundaries, the division of the place of deeds for a more systematic research, the priority examination of the traces that are at risk of degradation or even destruction, the discovery and fixation of objects and traces, their interpretation, comparing them (Stancu 2007, 611).

After delimiting the site and sealing it, first aid will be given to the victims and their transport will be ensured at the nearest health facility.

In the case of road accidents resulting in death or injury, the investigation of the place shall be carried out with the examination of the victims when they are still at the place of deed or the place where they were and will continue with the surface of the roadway to the vehicle remaining at the accident site; to the victim in the direction it is supposed to have disappeared. It will then examine the part of the road traveled before impact to detect traces of braking.

## Dynamic Stage

The most meticulous stage of road accident research since it goes beyond the static orientation stage as a whole and enters the scene. It will include analyzing in detail the place, traces and objects that can move objects from the place and from the original position, by methods typical of research. At this stage, the details of objects and traces will be taken, when the objects rise and place on a contrast surface to be easy to see. The detail photos will be made as much as possible with the lens perpendicular to the subject being photographed and accompanied by the measuring gauge or

measuring tape. Objects that can be transported will be carefully packaged and transported to forensic laboratories for detailed analysis.

In road accidents, during or before a road accident, the most widespread trace of the spot is the trace of the tire printed on the asphalt road. But it is not the only trace of traffic accidents, so of the plurality of track traces that can be encountered in road accidents, we mention:

### **Contact Points (Friction, Compression)**

In the case of a road accident, either impact between two vehicles or impact with a fixed obstacle, the process of friction or compression or even plunging, leads to the creation of specific traces that will be found on different surfaces present on the spot. The impact force produces deformations of the various smooth surfaces of the bodywork and/or other static objects. With on-the-spot investigation, criminal investigators must analyze the deformations and traces left at the impact, in particular, in detail. Friction or deformation traces can provide essential information about vehicle travel directions, their position, vehicle model, etc.

### **Traces of tires**

Vehicle tires are designed to ensure safe travel in different seasons, and these do not leave asphalt prints in specific situations. The first such situation is accelerated acceleration when moving off, tight turns at high speeds or sudden turns, heavy braking and skidding.

This type of tire tread specific to the hurrying of the vehicle is known to have lengths of less than 2 to 3 m, with an accentuated print on the front and losing intensity to the end. It is also specific that the traces contain rubber parts all over the surface and more severely on the edges. In the end, the traces are unclear, losing their tire print intensity.

The traces of braking tires reflect the way the brake pedal, the braking rate, the braking qualities of the vehicle are reflected in their appearance. In order to estimate the vehicle's speed in relation to the footprints left by the tire on site, the most common equation is:  $V = ST \times 254 \times Q / K$ , where ST represents the trace length, 254 is a coefficient, Q coefficient of adhesion, and K the operating coefficient of the brakes. Obviously, there is a proportionate ratio between braking and vehicle speed: when the vehicle's travel speed is higher at the time of braking, and the braking result is longer. Generally, the braking system does not operate effectively on wheels whose tires have not traced traces on the road. Note that at speeds above 40-50 km / h due to uneven braking on all wheels the skidding of the vehicle can lead to the appearance of traces on tires that have left no traces in the first part of the brake.

### **Traces of liquids**

As with the traces of the bodywork, the traces of liquids are caused by the impact and force it produces when a road accident occurs. The means of road transport, implicitly the cars, are provided in the front with refrigeration, heating, freon installations, engine oil baths, brake fluid pipes, hydraulic fluid, etc.

When the stains are in the form of elongated splashes or continuous streaks, then these traces point to the trajectory described by the vehicles. If the footprints are found before the impact site, then the cause that caused the loss of fluid is not related to the impact; if the trace lies only after the impact site, then the leakage is due to it. In the case of traces of brake fluid, it is necessary to establish precisely their place in relation to the impact site (Romanian Journal of Forensic Sciences 2011, 714).

The most obvious traces of liquids are those caused by oily substances, as they affect the surface of the asphalt, while other fluids can easily evaporate

### **Tracks taken from vehicles as a result of impact**

The impact force in the case of a road accident is directly proportional to the rolling speed of the vehicles at the time of impact. Because of the impact often parts of the vehicles or even the cargo can

be scattered on the surface of the research site. In the case of traffic accidents, different pieces or debris from the bodywork, namely bumper, mask, headlamp, rearview mirror, gaskets, connections, which will be described in the minutes and fixed, can also be found in the investigation of the scene by shooting in detail, and then lifted with great care to be used to identify the vehicle they come from. In the event of a collision between two vehicles, most of the shards are retained by them, the particles that are projected outward are initially influenced by the friction with the vehicles they come from, so the speed of their detachment is not the same as the impact velocity.

After designing on the road, glass fragments, depending on their size and shape, roll, slip or cling to the road asperities. Consequently, in the estimation of the coefficient of friction, 150% error can occur, which substantially compromises the precision of the calculation of the speed. Even when those conditions that introduce calculation errors narrow down, imprecision remains unacceptable. By restricting the types of suspected vehicles, it is possible to get to the one in question, and implicitly to the driver who left the place of the traffic accident (Romanian Journal of Forensic Sciences 2011, 713-714). And in such situations, there must be reservations in applying the relationships for calculating the impact velocity, as it is difficult to determine if those elements were not projected after the impact was consumed, when any screens were removed, for example, by starting the vehicle's rotation movements (Aionițoaie and Sandu 1992, 34-38).

### **Biological trace**

When we mention the biological traces we refer to the many traces that can be left on the spot that come from / on the surface of the human body and which identify with the investigation of road accidents. These traces can help to find out the key elements that lead to the elucidation of the case entirely, by clarifying and clarifying some unclear aspects.

In the field research, to determine the peculiarities of length and thickness, shape and distances are made with the measuring tape. This is made of plastic, 10 cm wide. and divided into squares of 10 cm, alternately colored in black and white. Scaling tape helps photographic measurements.

In traffic accidents, in all cases of papillary holes, they will be photographed next to a metric, so that they can then be redeemed by the Automatic Identification System (AFIS), where the mandatory condition is that the trace or photogram will be in natural size.

Detected biological traces can help establish the mechanism of road accident, the vehicle involved, the causes of the accident, the time of death, etc. Difficulties in examining victims or their clothing are encountered when they are moved from the place where they were found or transported to the hospital, meaning that the judicial organs will have to distinguish the traces subsequently produced by those that have been created on the occasion of the accident (Romanian Journal of Forensic Sciences 2006, 37).

The main biological trace is the blood trail, which is found on the road on the road, on the vehicle involved in the accident or on the body of the victim, in the form of spots, drops, splashes, spills, crusts. Analyzing the patterns of blood tracing, it identifies: the victim's position, knowing that fallen blood droplets leave traces with regular margins and a smaller diameter than the same drop of blood on the road if they fall from a higher height. The traces of blood are fixed by a word process by color photography.

The second most common biological trace is the human hair, which is frequently detected on wheels, protective bumper, on the mask door, the headlights, the inside, the steering wheel, the road, etc. The hair threads are raised with a tweezer and inserted into the test tubes, which will be marked accordingly.

The search for, retrieval and exploitation of digital traces is particularly important in the case of traffic accidents in which vehicles have been abandoned on the spot either by the owners or persons entrusted with their management but also in the event of theft after the accident, thieves abandon the stolen vehicle.

In these situations, the digital-palm traces will be searched on the glossy surfaces of the doors, the steering wheel, the mirror, the dashboard, the radio cassette and other surfaces inside the car.

The detection and fixation of these trace categories will be carried out according to the methods and means recommended by the forensic technique and will then be compared with the impressions of the suspected persons in order to identify the author of the traffic accident.

### **Conclusions**

The research is carried out urgently in the first place so that traces do not degrade or disappear, and secondly, because the urgency of conducting research ensures a good follow-up. Research requires it to be made, and reasoning is elemental if we consider that it is only from the on-site research that the evidence can be sampled and the traces that help to find out the truth in essence. The first people who arrive at the site are the police authorities who have been notified beforehand. They will be obliged to observe a series of tasks to take urgent measures to save the victims and secure the place of deeds against intentional or natural changes. On-the-spot research is unrepeatable because the very fact that the team of researchers intervenes in the perimeter of the crime scene involves the alteration of the scene and the impossibility of restoring the original traces to be intact.

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