

## **ANALYSIS OF ACCIDENTS AND THE TECHNOLOGY THAT REBUILDS THE PAST TO SAVE THE FUTURE**

To narrow the concept of accident can be used different definitions, views from various points of view, showing the complexity of reaching a unanimous position.

Generically, an accident can be considered as a possible event that alters the order of things. From the point of view of the law, they are considered accidents those random events that cause damage; WHO and the generically defined as an uncontrolled accident abnormal transfer of energy results in the occurrence of injuries or deaths.

More specifically, the accident has a variety of definitions among which there are differences based on the same random or unpredictable character. Therefore, in each country, statistical and management of road safety effects, they have established different legal and administrative definitions relating to traffic accidents.

The accident, despite its brevity, is a dynamic process that develops in space and time at certain points or areas and moments where the events occur. The union between one point and one point takes the name of position and involves a phase of the accident. Knowing your evolution allows research on improvements applicable to avoid the same mistakes in future cases or circumstances.

On the other hand, knowledge of accidents also vital to prevent and curb accidents important dimensions. So, make the driver aware of the processes that underlie and precede incidents is vital to explain what happens in accidents themselves, as to make explicit the behavioral parameters involved in these processes, the driver raises their risk perception approaching the real risk and therefore adopt safer behaviors.

To speak properly of accident or circulation, you have to give two additional conditions: the event occurring in a traffic lane and that has involved at least a moving vehicle.

As already predicted in the introduction, there are variety of definitions of accident, well exposed by experts or legislators. For example, the Manual of investigation of traffic accidents Baker (1970) is defined as a fact, event or unexpected event or unpremeditated containing an element of chance or probability and the results are undesirable or unfortunate.

But this use of the term "random" is now rejected by many of the researchers and professionals in the field of road safety by the connotations of unpredictability involved, which coincides with the belief, widespread among the population that accidents are a matter of luck and can not be avoided.

Montoro and Toledo (1997), however, exposed the idea that the incident is by no means a fortuitous, unavoidable, unpredictable or event dependent on luck but on the contrary, the vast majority of cases is characteristic parameters from distribution, in the accident is always a consequence of a failure avoidable and to some extent predictable system.

## WHY THE ACCIDENT OCCURS

Disruption of the balance of the system vehicle-user-way

Schematically, the system consists of user and satellite vehicle behaves in a pattern: the user receives information primarily visual, the road; this information causes user behavior, which acts on the controls of the vehicle; the vehicle interacts with the track and leads to a new situation in which the user has adapted vehicle conditions to the new situation of the road. Therefore, the system tends to a balanced position.

The degeneration of system operation can affect any of the elements or their interactions. When this occurs, the system continues to operate but not to a position of equilibrium. For example, this degeneration occurs when the information may result from a failure of the satellite, the user, vehicle or a combination of some of them. Another degeneration can occur when user interaction on controls is not the right vehicle.

Once the system deteriorates, it evolves to a different position of the equilibrium and working capacity is limited, although it may maintain some ability to allow the operating system back to the equilibrium position without reaching the accident.

Hyden (1987) defines "incident" as any event that may occur during driving as a result of an act or unsafe circumstance and that without generating any kind of damage or injury margin carries a high risk for the development of circulation. The driver does not evaluate many of these incidents as a risk, so these behaviors can become a habit thanks to the power of learning.

When the situation ends when the system is at least partially, out of control, causing the incident. This situation, which is due to impairment of the functioning of the system, may well evolve or to an equilibrium position, which recovers control and results in an incident without consequences or degenerate to collapse, becoming an incident with consequences and the resulting damage or accident.

The term "loss of control" should be interpreted broadly. It should not be considered exclusively the situation of loss of driver control over the vehicle. It has also been considered as loss of control any circumstance that limits the ability of interaction between the elements of the system.

For example, an obstacle in the road not perceived by the driver arrives to cause loss of tire contact with the road becomes a situation of loss of control, even when the driver circulate properly and the outcome of this loss Control does not have any consequences.

You can also give the circumstances of erratic driving for some time by driver distraction, thus giving the incident. If the situation remains in time, you can get into a position of loss of control and therefore accident.

From these examples it concludes that all accidents stems from a loss of control, a degeneration of system operation.

The imbalance between demands and capabilities

It is recognized that the accident occurs as a result of a conjunction or concurrence of multiple factors in a particular time and place. These factors are grouped into three broad categories, as indicated:

**- Route.-**

It is a fixed stage, but with the changing time, because they are different situations that may occur in it. These situations may have different user requirements. This level of requirements at all times requires a proper response from the driver or user to successfully overcome that level or security.

**- The vehicle.-**

It is pointless for the capacity the driver is in good condition if, for example, the vehicle's brakes fail. Therefore, the condition of the vehicle, as an extension of the driver influences the state of the driver-vehicle tandem.

**- The driver or user.-**

You must give an adequate response to the demands imposed response pathway, weather and environmental conditions, the movement and the rules and signals that regulate it. To provide such a response requires good information and a good capacity to act.

When the information to the driver is excessive or its responsiveness is affected by their physical and psychological state, such that it is impossible not only receive, but value it all or properly assess it, the responsiveness is affected negatively and may emerge failures, errors and accidents ensue.

The traffic system raises a number of diverse and changing demands that the driver must deal constantly adapting its capacity to act.

When, for any reason, such responsiveness is lower or falls below the level at that point had the requirements, the balance is broken and the car accident occurs. That is, to make driving safer, it must, at all times and circumstances, capacities are above the driver, or exceed, the demands of the situation.

The accident is thus the breakdown of that balance that should exist between the requirements and capabilities, that is, at the time that the level of exigencies of the situation exceeds the media that the driver has or may have for his performance.

According to the graph of Blumenthal, the driver can intervene in two ways. On the one hand, controlling at all times their own performance according to their skills and experience and, second, determining the requirements that the system presents. This conception of accident to define precisely the tasks of prevention of accidents to improve road safety.

The practical solution and powerful to investigate and reconstruct traffic accidents or crime scenes, which give us the keys to avoid them in the future, is the union of Trimble hardware and software solution.

With the Trimble Forensics SX10 solution, forensic teams they just have to pick up the instrument and work, passing less time on the scene, which minimizes the danger of being exposed on a motorway collecting data after a traffic accident. Parking is fast and simple, so data capture is not only more efficient it is also extremely accurate. Even the display and verification of point clouds is done on-site.

Once out of the scene of the accident and out of all danger, in your office you can continue with the investigation and reconstruction of any type of traffic accident or crime scene, reaching the conclusion of the same and being able to make the necessary decisions to avoid that tragic events will reoccur, in turn preventing thousands of deaths and serious injuries that will break the lives of millions of people around the world.

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