
Probability Analysis of Traffic Accident Occurrence Based on Incomplete and Unreliable Evidence

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Abstract: The paper presents a methodology for analyzing a traffic accident and evaluating the existence of a traffic accident in the conditions of incomplete and unreliable evidence. Namely, the examination of the causes of a traffic accident is the usual activity of traffic experts who, with their knowledge, experience and skills, help the court and parties in the court proceedings to find out from the qualified, experienced and impartial person the reasons for the occurrence of a traffic accident, and in relation to that, mistakes and responsibilities participants in a traffic accident. In contrast, lately there are phenomena of traffic accidents in which individuals and/or groups try to improvise traffic accidents in order to achieve their various benefits and interests. This paper provides a methodological approach to such an expert evaluation of probability of traffic accident evaluation with examples in the cases of vehicle-vehicle and vehicle-pedestrian collision.

Keywords: Traffic Accident, Probability, Evidence.

INTRODUCTION

Traffic accident reconstruction is the effort to determine, from whatever evidence is available, how an accident occurred. Accordingly, the reconstruction of a traffic accident is in a certain sense “intellectual reconstruction” of a traffic accident event presented and explained by a simple and comprehensible vocabulary with explanations of all the details of the particular phases - sequences of that event. Traffic accident reconstruction can be treated as a problem in uncertain reasoning about particular event, and developments in modeling uncertain reasoning for artificial intelligence can be applied to this problem. Physical principles can usually be used to develop a structural model of the accident and this model, together with an expert assessment of prior uncertainty regarding the accident’s initial conditions, can be represent as Bayesian network. At the First international Conference on Forensic Statistics Lindley (1991) argued that the probability should be applied to forensic inference more generally [1]. Lindley focused on problems for which the hypothesis of interest were the guilt or innocence of defendant, and the task was to weight the plausibility of these alternatives in light of evidence. His proposed solution was Bayesian, where one first determines prior assignment of probability to the alternative hypothesis, along with the probability of the evidence given each alternative, and then uses Bayes’s theorem to compute posterior probabilities for the hypothesis. This approach has since been applied to increasingly more problems in forensic identification (Balding, 2000; Dawid Mortera, 1998)

The subject matter of the expert examination, in the case of a traffic accident, is to determine the cause of the accident, i.e. the faults of all participants in the accident and their possible liability for these failures. Thus, when the course and dynamics of a traffic accident are presented, it gives the answer to the question of how the accident occurred. And the assessment of the technical capability, or the inability to avoid an accident, is given. In the some cases, the subject matter of the expert examination may be only the existence of a traffic accident, or giving an answer to the question: did a traffic accident really happen? The answer to this question is becoming more important in recent times when there is a “fake traffic accident” phenomenon in which individuals and/or groups try to improvise the occurrence of traffic accidents trying to achieve their different benefits and interests. This paper gives an example of a methodological approach to such an expert assessment.

PROBABILITY AS A MEASURE OF UNCERTAINTY

Probability is a branch of mathematics that aims to conceptualize uncertainty and makes it suited for decision making. So probability can be considered a significant branch of wider theme of “reasoning under uncertainty”. The probability estimation is dependent on two factors: event D whose probability is considered and information I available in relation to event D . The result of this assessment is the probability that event D occurs if it is I known. All probabilities are conditional because

they depend on certain information. Concept of probability and statistics are based on randomly variable, probability distribution and descriptive statistics. When facing the phenomenon of uncertainty, it is necessary to describe this uncertainty in some form. Knowledge of probability and statistics is used to articulate the amount of uncertainty. In the analysis of traffic accidents, uncertainties appear in each executed calculation. There are many reasons for this, and two most obvious are: (a) simplifying real physics into manageable mathematical expressions that cause insecurity, and (b) evidence is never perfect. It is necessary to distinguish the terms “population” and “sample”. The population is a set of all possible values and its total number can be a discrete amount, and the sample is a selected part of the population. However, in numerous examples of application in the assessment of traffic accidents there is an infinite number of values that can be assigned to each variable in a given diapason. Values that are defined as mean values and standard deviations are considered “unbiased” because with increasing data they are approaching the parameters of the population: $\bar{x} \rightarrow \mu; \delta^2 \rightarrow \sigma$, where μ is the mean, and σ variance (Figure 1.)

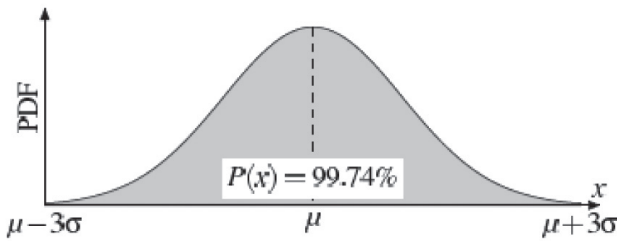


Figure 1. Typical probability density function

PROBABILITY ANALYSIS OF VEHICLE-VEHICLE COLLISION

The variable v_{ij} denotes the speed of vehicle i or vehicle j and takes value 0 if the speed was not grater then the speed limit, and takes value 1 if it is. The variable x_{ij} indicates the vehicle’s initial distance from the contact point and takes value 0 if this distance is „short“ and the value 1 if this distance is not short. The problem of more precisely defining of the term „short“ will, for now, be ignored. The variable Y_{ij} indicates whether a collision occurred and takes value of 0 if it is not, and the value is 1 if it is. It is assumed that the value Y_{ij} correlates with the values v_{ij} and x_{ij} according to the following equation [1]:

$$Y_{ij} = (1 - x_{ij}) - x_{ij}v_{ij}$$

Expressed by the words this equation means that the vehicles collision occurred in the case if the initial distance $(1 - x_{ij})$ was short, or in case this distance was not short, but the speed was greater than the limited speed $(x_{ij}v_{ij} = 1)$. Since all the variables belong to Boolean algebras, the dependence between Y_{ij} , and v_{ij} can be represented by a simple Boolean collision model (Table 1.) In Table 1., each given value for v_{ij}

and x_{ij} determines the possible state of the event between the vehicles. In the literature, the different column names in the table are used, such as “state”, “possible scenario” or “system state”. Also, in practice of philosophical logic, which becomes more and more common in the research of artificial intelligence, the term “possible worlds” is used. Here, in the following text, we will use the term “possible scenario”. Uncertainties in traffic accident reconstruction can occur when available evidence is not sufficient to determine which scenario is real.

Table 1. Possible scenarios and probability distribution for Boolean collision model

Possible Scenario	Vehicle "i"					Vehicle "j"					P_{ij}
	v_i	x_i	Y_i	$Y_{i=0}$	P_i	v_j	x_j	Y_j	$Y_{j=0}$	P_j	
1	0	0	1	1	1/4	1	0	1	1	1/4	1/16
2	1	0	1	1	1/4	0	1	1	0	1/4	1/16
3	0	1	0	0	1/4	1	0	0	1	1/4	1/16
4	1	1	1	0	1/4	0	1	1	1	1/4	1/16

For example, suppose we want to know if the speed of vehicle i was greater than allowed, and the only reliable evidence we have is that the collision occurred ($Y_i = 1$)

Table 1. indicates that this condition eliminates scenarios number 3 and 4 as an option, but from the remaining two scenarios two have the value $v_i = 0$ and two have the value $v_i = 1$, so it can be said that is possible, but not necessarily, that the speed of this vehicle was above limited value. On the other hand, let’s assume that, according to a reliable witness the initial vehicle distance from the contact point was long ($x_i = 1$) when the vehicle j entered the path of vehicle i . Only scenario 4 has $(x_i = 1)$ and $(Y_i = 1)$. In this scenario $(v_i = 1)$, so we can conclude that the speed of vehicle i was higher than allowed. Therefore, conditional probability that the speed of the vehicle was higher than allowed and the collision occurred:

$$P_{ij} (v_{ij} = 1 | Y_{ij} = 1) = \frac{P (v_{ij} = 1 | Y_{ij} = 1)}{P (Y_{ij} = 1)} = \frac{(\frac{1}{16} + \frac{1}{16})}{(\frac{1}{16} + \frac{1}{16} + \frac{1}{16})} = \frac{2}{3} = 0.67$$

PROBABILITY ANALYSIS OF VEHICLE-PEDESTRIAN COLLISION

In order to provide the findings on the circumstances and the probability of a traffic accident occurrence, all elements that are important for determining the course, dynamics and causes of traffic accident in case of a collision accident type “vehicle-pedestrian collision” are analyzed. The mentioned essential elements, their description and their significance for analyzing the probability of the subject event are given in Table 1. In order to determine the significance of a particular element for the probability analysis of the subject event, an analytical procedure is defined that determines the significance of an individual element, depending on the objective evalu-

ation of importance of that element for the adoption the final conclusion about a particular event. Objective evaluations of the importance of elements are classified into four categories, which are defined by linguistic expressions: exceptional, great, medium and low significance. The main objective of the analysis of the above elements is to obtain an answer to the question of whether the factual state and probability of a particular element *supports* or *does not support* the thesis that the event is “vehicle-pedestrian collision” type. An analysis of each of the above elements is based on the data from the court file and presented in the following text.

I. Location of vehicle-pedestrian collision (Collision Point-CP)

In the subject case on the spot no evidence on which to reliably able to determine the place where possibly there were contacts of vehicles and pedestrian. In most traffic accident cases with pedestrian place of vehicle impact on pedestrian can be determined if direction of the vehicle (skid marks) and the direction of movement of pedestrian are known, or if the location of lighter objects that belonged to the pedestrian at the time of flight time (hat, footwear, telephone, newspapers and the like) is determined. Given that in the present case there are no signs indicating the location of contact to state that it is not possible to reliably determine the location of pos-

sible collisions of vehicles and pedestrians. Probable location of this place can be estimated on the basis of other available elements such as: possible crash pedestrians after the collision, position marking glass and blood in the area of a possible fall of pedestrians, the most likely mode of movement of pedestrians, damage to the vehicle and the estimated most probable speed of the vehicle at the time it encounters pedestrians. If we accept the estimated speed of the vehicle at the time of collision with a pedestrian, which is 50 km / h (see paragraph VI of findings) and place indicated on the sketch of the scene as the resume body pedestrians after the crash then the distance dismissal pedestrians could amount to about 17, 0 m, including the distance that the vehicle and pedestrians crossed at a combined speed of 50 km / h after the body was loaded onto the vehicle. However, this version of events is unlikely since it is evident that there are no indications that the vehicle is braked, which would cause a separation of pedestrian body from the vehicle.

This element “Location of vehicle-pedestrian collision” is of extraordinary importance for analyzing the subject event and for determining the likelihood of its occurrence. The absence of any material tracks on the carriageway that would determine the location of the collision or associate with the location of the vehicle and pedestrian contact does not support the thesis that the incident in question is a traffic accident of vehicle-pedestrian collision type.

Table 1. Elements relevant to the analysis of a traffic accident type “vehicle- pedestrian collision” and their significance for analyzing the likelihood of the subject event

No.	Element	Description	Significance for analyzing the likelihood of a given event
I	Location of vehicle-pedestrian collision – Collision point (CP)	It represents the place where the vehicle-pedestrian collision occurred	Extraordinary Significance
II	Location of damages and traces on the vehicle (VD)	It represents the type and location of damages found on the vehicle that were created in the collision with a pedestrian, as well as all other traces of the contact and the mutual relationship of these damages with injuries to the pedestrians.	Extraordinary Significance
III	Pedestrian injuries (PI)	The injuries sustained by the pedestrian during contact (collision) with the vehicle and the mutual relationship of these injuries to the damages on the vehicle.	Extraordinary Significance
IV	Way of movement and behavior of pedestrian before collision with a vehicle (PB)	Defines the way and direction of pedestrian movement in relation to the carriageway immediately before contact with the vehicle and the pedestrian behavior in relation to the way of the vehicle movement.	Great Significance
V	Way of vehicle movement and behavior of the driver before a vehicle-pedestrian contact (DB)	It represents direction and the way of vehicle movement before contact with the pedestrian and the behavior of the driver in relation to the way of pedestrian movement	Great Significance
VI	Technical capability or inability to avoid collision of vehicles and pedestrian –Collision avoid ability (CA)	It represents an analysis of the ratio of available space and time for the driver in relation to the position of pedestrian. It also represents the basis for the conclusion on the cause(s) of the accident	Great Significance
VII	Speed of the vehicle at the time of the collision with a pedestrian (VS)	It represents the speed of the vehicle at the moment of contact with pedestrian.	Medium Significance
VIII	Place and distance of pedestrian body rejection after collision (PR)	It represents the distance from the place of vehicle-pedestrian collision and the place of pedestrian fall after the collision and relationship of this place with the way of pedestrian and vehicle movement.	Low Significance
IX	Position of the vehicle after a collision with a pedestrian (VP)	It represents the place of stopping the vehicle after a collision with a pedestrian	Low Significance

II. Location of damages and traces on the vehicle (Vehicle Damage-VD)

The following damages to the subject vehicle has been identified: the headlamp, the bonnet (hood), the front left mudguard on the side in the front panel, the front windshield rack frame on the left side at a height of about 1.90 m. The intensity of the damage and the precise location of these damage are not listed and are not described in detail. In traffic accidents like "vehicle-pedestrian collision", besides damage to vehicles, remain traces such as traces of swabs on the vehicle, traces of tissue, traces of hair and traces of blood. However, in the concrete case, these tracks were not found. The front bumper is the most extreme point on the vehicle and is located at a height of 0.65 m from the ground. In case of a frontal collision, the first contact of the vehicle with the body of pedestrians is achieved by a bumper. Since the height of the bumper is considerably lower than the center of the body of the pedestrian then there is a horizontal rotation of the body around the point of the center of gravity and the body leakage on the hood, and then on the windscreen, depending on the speed of the vehicle.

This element of "Location of damages and traces on the vehicle" is of extraordinary importance for analyzing the subject event and for determining the likelihood of its occurrence. The results of the analysis of this element and the absence of correlation between this element and the element "Pedestrian injuries" does not support the thesis that the incident in question is a traffic accident of vehicle-pedestrian collision type.

III. Pedestrian injuries (PI)

In traffic accidents like "vehicle-pedestrian collision", parts of the pedestrian body with the highest percentage of injuries are legs (32.6%) and head (31.4%), followed by breast (10.3%), arms (8.2%), pelvis (6.3%), etc.

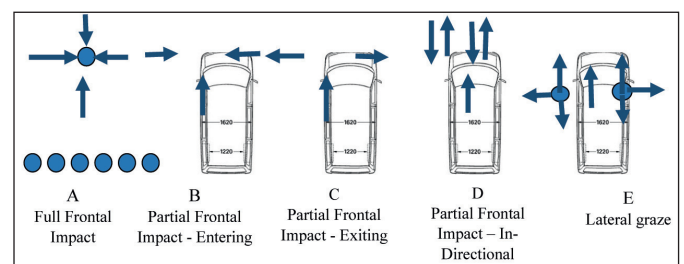
In the frontal vehicle/pedestrian crash, the primary contact is achieved by striking the front bumper of the vehicle into one or both legs of the foot pedestrian. Already at relatively low speeds, the impact of a bumper force often results in the breakdown of the lower legs. Due to this primary contact, the pedestrian feet are pulled in the direction of the vehicle movement, whereby the body of the pedestrian receives a rotational acceleration around its center of gravity with the direction of rotation which is opposite to the direction of movement of the vehicle. Immediately after this primary kick of the front bumper in the foot of a pedestrian, a vehicle of a pontoon type or a combination of a pontoon-box type, an adult's pelvis and pelvis strikes in the front of the bonnet (hood). In this way, the body of the pedestrian receives a very powerful translational acceleration, which often results in severe injuries to the hip and hip hips, due to very large impact forces. Although the front of the vehicle in question has a distinctive transition shape from a pontoon to

a box, this shape, however dominant, has features of a pontoon shape. However, no injuries were found on the pedestrian to match the injuries resulting from the collision of the above-mentioned vehicle body shapes.

This element of "Pedestrian injuries" is of extraordinary importance for analyzing the subject event and for determining the likelihood of its occurrence. The results of the analysis of this element and the absence of correlation between this element and the element "Location of damages and traces on the vehicle" does not support the thesis that the incident in question is a traffic accident of vehicle-pedestrian collision type.

IV. Way of movement and behavior of pedestrian before collision with a vehicle (Pedestrian Behavior-PB)

According to the records, two pedestrians were walking next to the each other, along the right side of road in the same direction as motor vehicle. According to the standard size of the carriageway surface when walking pedestrians could occupy a space of about 1.5 m along the width of the carriageway. The probability of the type of vehicle-pedestrian collision in the concrete case is analyzed (Figure 2.). Based on the evidence from the court-case file variants A, B, C and E are excluded as possible alternatives. It was concluded that there might be a likelihood that the case D (Partial Frontal In-directional Impact) occurred, but only if only one pedestrian were present. However, this variant was unsustainable because, in reality, two pedestrians were present and injuries of pedestrians and damages of vehicle do not support this alternate.



There are no elements in the content of the file that would indicate the lateral movement of any of the above-mentioned pedestrians. Also, there is no element in the content of the case file that would indicate any reaction of the pedestrians to the presence of the vehicle, including the "reflex reaction". Based on the above, it can be concluded that for pedestrians in the concrete situation, there was no indication of presence of any sudden of danger factor. The lack of a sudden hazard situation and non-action of pedestrian to avoid contact with the vehicle is totally atypical for traffic accidents like "vehicle-pedestrian collision".

This element of "Way of movement and behavior of pedestrian before collision with a vehicle" is of great importance for analyzing the subject event and for determin-

ing the likelihood of its occurrence. The results of the analysis of this element and the absence of correlation between this element and the element “Way of movement and behavior of the driver before a vehicle-pedestrian collision” does not support the thesis that the incident in question is a traffic accident of vehicle-pedestrian collision type.

V. Way of vehicle movement and behavior of the driver before a vehicle-pedestrian collision (Driver Behavior-DB)

According to data from the content of the court file, it can be concluded that the road is straight, without curves in the zone of the accident site, that pavement is 3.90 m wide, was dry at the time of the accident, that the weather was clear and that the place was illuminated by street lighting. It can also be noted that, at the time of the accident, there were no other vehicles and other pedestrians. Since there are no traces of braking on the spot or any other traces indicating a slowdown of the vehicle or some other maneuver, it can be concluded that the speed of the vehicle at the time of the collision with pedestrians was equal to the speed of that vehicle before the collision. Also, there are no indications of a change in how the vehicle moves after a collision with pedestrians, and it can be concluded that the speed of the vehicle has remained the same, that the speed after the collision is identical to the speed of the vehicle before the collision and that the vehicle continued to move without stopping.

This element of “Way of movement and behavior of pedestrian before collision with a vehicle” is of great importance for analyzing the subject event and for determining the likelihood of its occurrence. The results of the analysis of this element and the absence of correlation between this element and the element “Way of movement and behavior of pedestrian before a vehicle-pedestrian collision” does not support the thesis that the incident in question is a traffic accident of vehicle-pedestrian collision type.

VI. Technical possibility or inability to avoid collision of vehicles and pedestrian (Collision Avoid-ability)

There was an objective possibility for the driver of the vehicle to see pedestrian on the road. Also, there was a technical possibility for the driver to avoid a collision with pedestrian because the minimal available visibility distance (40 m) was much longer than required stopping distance (28 m). The technical ability to avoid collision with pedestrian would also exist at speeds greater than 50 km/h, that is, the technical ability to avoid an accident would be at all speeds less than 64 km/h. Also, for pedestrian there was an objective possibility to see the lights of the vehicle and to hear the approaching vehicle, and there was more than a sufficient time interval to avoid contact with the vehicle.

This element of “Technical possibility or inability to avoid collision of vehicles and pedestrian” is of great importance for analyzing the subject event and for determining the likelihood of its occurrence. The results of the analysis of this element does not support the thesis that the event is a traffic accident of the type vehicle-pedestrian collision because the existence of conditions for the technical ability to avoid an accident, both for the driver and pedestrians, and the absence of any reaction of any participant in the accident question is the real cause of this accident.

VII. Speed of the vehicle at the time of the collision with a pedestrian (Vehicle Speed-VS)

According to this length of glass scattering and interdependence, and the length and speed of the vehicle's impact on pedestrians, the speed of the vehicle at the time of the flight could range from 50-55 km / h. The reality of this speed of the collision is confirmed by the results of scientific-expert survey of the sample of 374 actual cases of vehicle impact on pedestrians with fatal consequences and consequences of bodily injuries to pedestrians. Namely, the results of these studies show that almost seventy percent (69.4%) of cases of speeds ranged from 30-59 km / h (speed from 30 to 39 km / h, 23.4%, speeds of 40 to 49 km / h in 23.4% and speeds of 50 to 59 km / h in 22.5% of cases). The vehicle speed at the moment of a pedestrian run is significant from the point of view of the accident and from the aspect of time-spatial analysis of the event, or analysis of the possibility or inability to avoid an accident. However, the exact amount of speed in a particular case is not decisive for determining the likelihood of a traffic accident occurrence.

This element of “Speed of the vehicle at the time of the collision with a pedestrian” has a secondary importance for analyzing the event in question and determining the likelihood of its occurrence. The results of the analysis of this element can partially support the thesis that the event is a traffic accident of vehicle-pedestrian collision type.

VIII. Place and distance of pedestrian body rejection after collision (Pedestrian Rejection-PR)

The blood traces found on the spot on the left side of road may associate with the place of the pedestrian fall after a collision with the vehicle. However, these tracks are not described in detail so that they cannot be a reliable basis for the claim that this is the real place of the fall of pedestrians after the vehicle's collision. These tracks cannot be reliably linked to the probable location of the crash site and the position of the vehicle and pedestrians as previously described.

This element “Place and distance of pedestrian body rejection after collision” has less significance for analyzing the event in question and determining the likelihood of its occurrence. The results of the analysis of this element do not support

the thesis that the event is a traffic accident of a type of vehicle-pedestrian collision type since the position of the traces, which could possibly indicate and represent the place of the pedestrian fall after the collision with the vehicle, is incompatible with the relationship between the direction, speed and direction movement of vehicles and pedestrians

IX. Position of the vehicle after a collision with a pedestrian (Vehicle Position-VP)

The vehicle did not stop after an eventual collision with pedestrian, so that there is no data on the position of the vehicle after the collision. The absence of vehicles on the spot after a possible collision with pedestrian partially does not support the thesis that the event is a traffic accident. However, this element can also partially support this thesis because it can be assumed and accepted the fact that it was about to be removed from the scene of the accident for reasons known to the driver. These reasons cannot be reliably established.

This element "Position of the vehicle after a collision with a pedestrian" is of low importance for analyzing the event and determining the likelihood of its occurrence. The results of the analysis of this element can partially support the thesis that the event is a traffic accident of a type vehicle-pedestrian collision.

PROBABILITY CALCULATION SUMMARY

Probability can be calculated after weight is assigned for each analyzed element. Analysts can develop weights that reflect their experience and knowledge in a natural and intuitive manner. The following methods can be used to set the weights:

- Uniform weighting
- Direct weighting
- Delphi technique
- Gambling method
- Mutual consultations or opinion pools (observers)
- Comparison of criteria pairs (Pair-wise comparison between criteria)
- Establishing a hierarchy of priorities and using AHP (Analytic Hierarchy Process)

In our example weighting is based on mutual consultations and opinions applying analytical method that reflects analysts' experience and professional judgement. For each analyzed element the weight values are determined depending on the degree of element importance (Table 2.)

Table 2. Weight of analyzed elements

Element (x)	CP	VD	PI	PB	DB	CA	VS	PR	VP
Weight (q _i)	9.0	9.0	9.0	7.0	7.0	7.0	5.0	3.0	3.0
Significance	Extra	Extra	Extra	Great	Great	Great	Medium	Low	Low

Total values of weight for all elements that *do not fully support* the hypothesis that the subject event is the vehicle-pedestrian collision:

$$H^- = \sum_{i=1}^m q_i = 9.0 + 9.0 + 9.0 + 7.0 + 7.0 + 7.0 + 3.0 = 51$$

Total values of weight for all elements that *do not partially support* the hypothesis that the subject event is the vehicle-pedestrian collision:

$$H^{\mp} = \sum_{i=1}^m q_i = 5.0 + 3.0 = 8$$

On the basis of the above values, the minimal, mean and maximal probabilities are calculated:

- Minimal probability that the subject event (A) is not vehicle-pedestrian collision and maximal probability that event (B) is vehicle-pedestrian collision:

$$P(A)_{min} = \frac{48}{59} = 0.81, P(B)_{max} = 1 - 0.81 = 0.19$$

- Mean probability that the subject event (A) is not vehicle-pedestrian collision and mean probability that event (B) is vehicle-pedestrian collision:

$$P(A)_{mean} = \frac{51}{59} = 0.86, P(B)_{mean} = 1 - 0.86 = 0.14$$

- Maximal probability that the subject event is not vehicle-pedestrian collision and minimal probability that event (B) is vehicle-pedestrian collision:

$$P(A)_{max} = \frac{51 + 0.5 \times 5.0 + 0.5 \times 3.0}{59} = \frac{55}{59} = 0.93, P(B)_{min} = 1 - 0.93 = 0.07$$

CONCLUSION

The results of the analysis of the relevant factors for assessing the likelihood of a traffic accident do not support the thesis that the incident in question is a traffic accident of the type vehicle-pedestrian collision.

Out of a total of nine analyzed important elements, the results for the seven elements, of which three (3) elements have extraordinary significance, three (3) elements are of great importance and one (1) element has low significance, do not fully support the thesis it's a traffic accident. The results of the analysis for the remaining three analyzed elements, whose significance is defined as medium or low, partially support the thesis that it is a traffic accident. It is possible, furthermore, to provide appropriate numerical weight characteristics to the relevant elements (factors) and to indicate the numerical values of the above probabilities.

The presented examples indicates that there are

similarities and differences in the analysis of the flow and dynamics of the accident and the assessment of the probability of a car accident. It is necessary for a traffic expert to analyze thoroughly and critically all the essential elements - the parameters of the accident that would otherwise be analyzed in case of an accident actually happened and to say whether the results of the analysis of these elements support or do not support a well-founded hypothesis.

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