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Method of Hazard Occurrence Moment Definition in the Event of Pedestrian Knockdown Accident (Pedestrian Crossing the Road out of Walkway).

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Abstract

Purpose of this paper is to improve methodology of pedestrian knockdown accidents investigation. Object of research – development of method of hazard occurrence moment definition in case of pedestrian knockdown accident. This article is presenting and describing particular features of the given hazard occurrence moment, generalizing the available materials pertaining to topic under consideration and introducing a new scientific turn of speech "truncated pedestrian's stopping distance". Subject of research – determination of "truncated pedestrian's stopping distance" with reference to his rate of motion. Authors' proposal may be treated as an integrated practice of pedestrian knockdown accidents investigation (pedestrian crossing the road out of walkway) allowing to avoid diametrically opposed conclusions regarding the driver's guiltiness.

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1. Introduction

Issue regarding the moment of hazard occurrence in case of pedestrian knockdown accident had been raised by scientists and auto-experts sufficiently long ago. It was especially difficult to define the moment of hazard

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occurrence for the driver in case of knockdown accident involving pedestrian crossing the road out of walkway. Thus, N.M.Kristi in Methodological recommendations [Department of legal expertise of Juridical Committee in the Council of Ministers of Russian SFSR (1971)] which are applicable today, points out: "...**pedestrian, during vehicle approach time, may change his conduct and (as it happens in the vast majority of cases) stop in order to yield the right of way to the vehicle...**". This conclusion is arising from the point that a pedestrian crossing the road out of walkway (or in place where it is forbidden to do so) has no right-of-way and, in compliance with art. 2, it. 4.5 of Rules [Traffic Rules of the Russian Federation (2015)], may not "cause interference with road traffic".

That is to say, if the driver could observe the whole pedestrian's travel way from entering the traffic way he (as a person having the priority) had a right to expect that pedestrian being an equitable road user (however, crossing the traffic way in unauthorized place) could stop so as to follow the Traffic Rules and to yield the right of way to the vehicle.

It should be underlined that auto-technical expertise has never had any integrated practice regarding the definition of hazard occurrence moment for the moving vehicle whose driver had priority at the moment of pedestrian's crossing the road outside the specified walkway.

Nevertheless, our country's accident statistics analysis for the recent years shows that number of pedestrian knockdown accidents is unacceptably high. Besides, in most cases it is the driver who is adjudged guilty in case of knockdown accident especially in case of pedestrian injury or death. To exclude such cases, it is necessary to develop a unique approach in resolving the issues regarding the moment of hazard occurring for the vehicle in knockdown case.

2. Analysis of RA investigation experts' opinions about hazard occurring moment in pedestrian knockdown accident case

In other papers, like in aforementioned recommendations, N.M. Kristi does not give any definition of hazard occurrence moment in knockdown accident case. However, he gives an approach allowing, in some cases, to solve this problem. It consists in assumption that disturbance of interrelationships within HVRE system (Human-Vehicle-Road-Environment) is leading to failure of the entire system and, consequently, affects all the road users. In support, some road situations are given as examples. In addition to that, individual cases that were considered do not allow to derive a common (for all knockdown cases) algorithm of resolving the issue regarding definition of hazard occurrence moment, i.e. the margin subsequent to which the driver's actions should not be considered from the viewpoint of compliance or non-compliance with Traffic Rules. At that, apart from research of N.M. Kristi made in early 1970s, up to now there have not been any remarkable investigations in this sphere. Issues regarding definition of hazard occurrence moment were addressed by: V.A. Ilarionov, Yu.B. Suvorov [Suvorov (2003)], V.A. Gorodokin [Gorodokin and Kudryavtseva (2015)] and A.V. Sarayev [Sarayev (2014)]. For instance, V.A. Ilarionov, in his book [Ilarionov (2014)], offers that expert defines the hazard occurrence moment independently, i.e. relying on his own knowledge and driver's experience, where such case has not been treated either by investigation or by court. V.A. Ilarionov offers to designate (in the given traffic situation), as a hazard occurrence, the moment of pedestrian crossing (i) the right verge of the roadway when pedestrian is moving from the right to the left in reference to traffic direction or (ii) the axial line – when he is moving from the left to the right. According to paper authors, in most cases it is not allowed to designate crossing of axial line or verge of the roadway as hazard occurrence moment. For instance, if the roadway has more than three lines and the vehicle is moving by the line which is the most distant from the pedestrian it means that their trajectories may never intersect (no knockdown is expected). Besides, the pedestrian having stepped out to the roadway may stop in order to yield the right of way to the vehicle causing their trajectories not to intersect either. Moreover, the driver observing the Traffic Rules may expect the same behaviour from all the other road users that is why, from the viewpoint of law-abiding driver, the latter development of traffic situation is most probable.

3. Definition of hazard occurrence moment in the event of pedestrian knockdown accident

According to the authors, **traffic hazard** where pedestrian attempts to cross the roadway in unauthorized area , *will occur when the driver begins to miss the grounds to assume that pedestrian will be capable to stop his motion in*

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