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Car-pedestrian and car-cyclist accidents in Hungary

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Abstract

This study is connected to the PROSPECT project (PROactive Safety for PEdestrians and CyclisTs) that has a goal of developing a proactive on-board-system to cars. This system will more effectively identify and manage the incidents with VRUs (Vulnerable Road User) compared to those that are currently on the market. One of the first steps of our task is to define with statistical examination the main causes and circumstances which lead to car-pedestrian and car-cyclist accidents in Hungary. The basis of the accident research was a database about raw accident data (in chart form) provided by the Hungarian Central Statistical Office (KSH). This data was then systematized by a data managing system, and after the relevant queries, we processed it. This paper presents the results of this investigation which will be used to improve the software and hardware of the on-board-system.

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Keywords: accident; car accident; pedestrian accident; cycling accident; vulnerable road users
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1. Introduction

The White Paper (Roadmap to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System) contains European Union goals on the area of traffic safety. *„By 2050, move close to zero fatalities in road transport. In line with this goal the EU aims at halving road casualties by 2020."* (European Commission, 2011) The goal set to 2020 is compared to the year 2010.

The reduction of pedestrian deaths in the EU in 2011 and 2012 was about 4% and was 2% in 2013. In the case of cycling accidents the reduction was annually lower than 1% in the period of 2011-2013 (European Transport Safety Council, 2015). According to these numbers the reduction of pedestrian and cyclist deaths is not enough to reach the 2020 goal (assuming equally 50% reduction per all modes of transport.)

In order to reach the EU goals, more effective methods are needed than currently in usage in order to improve traffic safety. Regarding this the White Paper suggests many actions, among them the introduction of the driver assistance systems and the particular attention to vulnerable road users such as pedestrians, cyclists and motorcyclists.

The goal of PROSPECT project is to develop a sensor and interruption system that can be integrated into cars and is able to recognize traffic situations that has accident hazard with pedestrians or cyclists. The method of identifying these situations consists partially of the examination of previous accidents, which shows what circumstances lead to these accidents, so in what cases the system needs to think that there is a probability of such a conflict. During the

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project such analytical statistics were made by the traffic accident databases from Sweden (made by Chalmers University of Technology), from Germany (made by Bundesanstalt für Straßenwesen, as BASt) and from Hungary (made by Budapest University of Technology and Economics, as BME).

2. Method

The data for the preparing of road traffic injury statistics are from the database of KSH. This database is based on accident data sheets that are recorded during the police crime scene after an accident. According to international practice, **the outcome of an accident and the injury severity** (fatal, serious, slight / killed, seriously injured, slightly injured) **were taken into account 30 days after the accident**. In contrast, **for the suspected offender and the primary reason of the accident we relied on the findings at the crime scene**.

The database basically consists of 3 charts, the first one contains the data of accident (place, date, outcome, accident type etc.), the second one of participants (suspected offender, role in the traffic etc.), and the third one of the injured (age, sex, injury severity etc.). The participants and injured who were in the same accident can be identified by their unique accident identifier. The other identifier that belongs to the participants can be used to assign the injured to a vehicle. This structure of the database made it necessary to use a data managing system. After we managed to build an adequate database structure, we used the relevant queries and sorted the results in chart and graph form. We summarized the results of the research in the third chapter.

In this project **we examined accidents between 2011 and 2014 in Hungary**. First we identified some general accident rate indicators and from there we proceeded to investigate the pedestrian and cycling accidents and particularly to a more detailed examination of the car-pedestrian and car-cyclist accidents. This task of PROSPECT project has a lower focus on pedestrian accidents because those were investigated by another project before (AsPeCSS – Assessment Methodologies for Forward Looking Integrated Pedestrian and Further Extension to Cyclists Safety). During the work, of course, we have to consult with partners who are also responsible for analysis of accident data in their own country, because their accident database may have another structure and contain other data.

3. Results

3.1 General accident data

In the investigated four-year period annually an average of 15-16,000, a total of 62,539 personal injury traffic accidents occurred. From these accidents 2,217 (3.6%) were fatal, 18,282 (29.2%) were serious and 42,040 (67.2%) were slight. In these accidents approximately 20,000 people injured each year, a total of 81,874 in 4 years, of which 2,460 (3.0%) were killed, 20,775 (25.4%) were seriously injured, 58,639 (71.6%) were slightly injured. (Table 1.)

The number of accidents and injuries over the years did not change significantly, it stayed approximately the same. In terms of all accidents the suspected offender in 37,185 cases (59.4%) were the car driver, in 7,660 cases (12.2%) the cyclist and in 3,823 cases (6.1%) the pedestrian.

The next two subchapters present the results of investigation of car-cyclist and car-pedestrian accidents.

Table 1. Accidents in Hungary between 2011 and 2014.

	Outcome of accident	2011	2012	2013	2014	Total
Number of accidents	Fatal	563	541	540	573	2,217
	Serious	4527	4,355	4,687	4,713	18,282
	Slight	10,737	10,278	10,464	10,561	42,040
	Total	15,827	15,174	15,691	15,847	62,539
Number of persons killed or injured	Killed	638	605	591	626	2,460
	Seriously injured	5,154	4,921	5,369	5,331	20,775
	Slightly injured	15,051	14,064	14,729	14,795	58,639