STUDY OF PEDESTRIAN BEHAVIOUR AT CROSSWALKS AND ANALYSIS OF CONFLICTS BETWEEN MOTORIZED AND VULNERABLE ROAD USERS

Introduction

InDev is a European Project, which main goal is an improvement in the safety of vulnerable road users. To achieve that result, an integrated methodology to understand VRU’s accident causes is being developed and a framework for a comprehensive assessment of socio-economic costs linked to road accidents is being provided. In the comprehensive background of InDev project, my work has been the development of three main tasks:

1. the reviewing of the InDev handbook about methods and techniques for the analysis of safety of vulnerable road users;
2. the identification of near-crashes in video datasets;
3. the study of near-crashes with the help of a semi-automated video analysis software.

The main goals are:
- Obtaining a deeper knowledge about VRU’s safety state-of-the-art;
- The ability to identify and study near-crashes in order to better understand the accident process;
- The analysis of safety measures and pedestrian behavior magnitudes with the aim of highlighting their trends and changes;
- The comparison of VRUs’ behavior at signalized and non-signalized crossroads.

State of the art

From handbook review, a state-of-the-art about vulnerable road user’s safety analyses and measures has been worked out. Particularly, the following issues have been treated:
- Road accident analysis techniques;
- Accident self-reporting;
- Surrogate safety measures and traffic conflict observations;
- Behavioural observation studies and naturalistic studies;
- Site observations of traffic infrastructure;
- Estimation of socio-economic costs of injuries to vulnerable road users.

TTC = Time-To-Collision: the time required for 2 vehicles to collide if they continue at their present speed and along the same path. TAdv = Time Advantage: indicator used to describe situations where 2 road users pass a common spatial zone, but at different times and thus avoid a collision course.

Results

Trend of T2 and TAdv over time

Comparison of pedestrian speed over time

Trajectories in the two kinds of intersection

Surrogate safety measure comparison and speed best fitting distribution

Conclusions

The results of the research show:
- A common descending trend of the safety measures over time;
- The existence of an upper boundary for the values of time and speed measures;
- An initial increasing trend of pedestrian speed over time, with the stabilization of the values around 1.5 m/s;
- The validation of the surrogate safety measures in the non-signalized intersection;
- Organized trajectories in signalized intersection, spread ones in non-signalized crossing;
- Results support the shared space theory;
- Psychological reason under VRU’s behavior.