

## ***Interactive comment on “Identification of traffic accident risk-prone areas under low lighting conditions” by K. Ivan et al.***

**K. Ivan et al.**

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Dear De Santis,

First of all, we would like to thank for your opinions and valuable comments. 1) "...do the authors mean for this term just the number of deaths? Or do they extend this also to all injured people?" In the present study, the victims of traffic accidents (moral loss) include both the number of deaths and the number of injured persons, because we didn't have separate access to the number of deaths, so we extended to all injured people. In this paper we take into consideration all the accidents, regardless of whether such events led to loss of life or only to injured persons. We will include a clear explanation about this point into the final version of the paper. 2) Until recently we didn't

C532

have access to the complete database regarding the number of traffic accidents from Cluj-Napoca. Now we obtained an additional dataset related to the accidents that occurred in 2011-2013 from official source (Cluj County Police Inspectorate) completing the data from 2010. This way we will use the database for all period 2010-2013 from official source in the final version of the paper. We have to mention that there is a public lighting program. Artificial lighting is added suddenly in December to natural illumination which is in constant reduction from one month to another. Therefore, a threshold appears in terms of continuity of the real lighting (as sum of the natural lighting and artificial lighting), which can influence the number of accidents. On the OX axis in Fig. 3 we have only natural hours of darkness per month and no real lighting which is difficult to quantify and if we do this, it is possible that errors would occur. 3) Linear regressions results in Fig. 3 illustrate that the number of accidents increases concomitantly with the number of low lighting hours, just in the three seasonal variations mentioned. "...the number of accidents in November (around 54 accidents/month) with more than 1800 hr darkness/month is much higher than in December (around 34) which has about 2100 hrs darkness/month". Using the database from official source we will analyze the data to obtain results quite close to reality and complete. We assume that the complete period 2010-2013 will be a representative sample size of the statistical population which reflects injured persons. Even without doing a clustering analysis, the cloud of points in Fig. 3 is split in three interesting seasons, because, as you said, November looks more like October and previous months than December. Even if based on the completed sample, this thing remains the same, it means that another factor interferes, namely the severe weather. Usually in Cluj, in December, January and February there is snow, which is partially cleaned by authorities, while in the previous season, the quantity of rainfall increases successively from July until November. After that, the rainfall changes in solid precipitation. We will try to check your suggestion on the possible influence of worse weather conditions. 4) "No error estimation of the linear regression parameters is made" In the final version of the paper we will create the error estimation of the linear regression parameters, which can be done easily. Thank you for the suggestion.

C533

In conclusion, we understand your observations were based the analysis of a truncated sample, but this thing we can correct. If we maintain the possibility to publish this paper, we rewrite the content on the basis of a larger sample and we will consider the above observations. After all, this paper aims at influencing public authorities to introduce artificial lighting, earlier than before.

Sincerely, Ivan, Haidu, Benedek, Ciobanu

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