TRANSPORT
ISSN 1648-4142 / eISSN 1648-3480
2017 Volume 32(2): 160–166
doi:10.3846/16484142.2014.914571

ASSESSMENT OF THE PRECISION OF DATA COLLECTED ABOUT THE TRAFFIC ACCIDENTS WITH PROPERTY DAMAGE ONLY IN CLAIM HANDLING PROCESS BY INSURANCE COMPANIES

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Submitted 30 May 2013; accepted 17 March 2014;
first published online 9 May 2014

Abstract. The number of serious road traffic accidents is decreasing in all European countries. Based on the trends and directions in the past it may be predicted that in longer perspective the number of serious road traffic accidents will decrease remarkably. This will create a situation where it is more and more difficult to ensure the reliability of traffic safety analyses performed by statistical methods. There are two possibilities to decrease the problem: either to carry out in-depth investigations of serious road traffic accidents and/or investigate also Property Damage Only (PDO) traffic accidents and traffic conflicts in addition to serious traffic accidents. The key issue in using the PDO accident data is its precision. The present paper is attempting to enlighten the area, and assess the quality of data of PDO road traffic accidents collected by insurance providers by example of Estonia. The survey results show that in spite of certain shortcomings, the PDO road traffic accident data collected by insurance provider is valuable to be used in traffic safety analyses.

Keywords: road traffic accident; property damage accident; accident data; data quality; geocoding; accident location; accident time.

Introduction

The number of serious road traffic accidents is decreasing in all European countries. According to the European Commission, the average decrease in the annual number of fatalities in Europe between 2000 and 2010 was 6% (European Commission 2013). According to the OECD, the total number of people injured in traffic accidents in EU, USA and OECD Member States between 1998 and 2010 decreased by 50%, 31% and 41%, respectively – see Fig. 1 (OECD 2011).

Approaches similar to the safe system (International Transport Forum 2012) are becoming more widespread, where the goal is that people would not die or get serious injuries in traffic. Based on the trends and directions in the past it may be predicted that in longer perspective the number of serious road traffic accidents will decrease remarkably. It yields to smaller numbers of accidents suitable for analyses and statistically significant result may not be reached. Especially if stratification of accidents by age of casualties, transport mode, etc. is needed (Stipdonk *et al.* 2013). Statistical

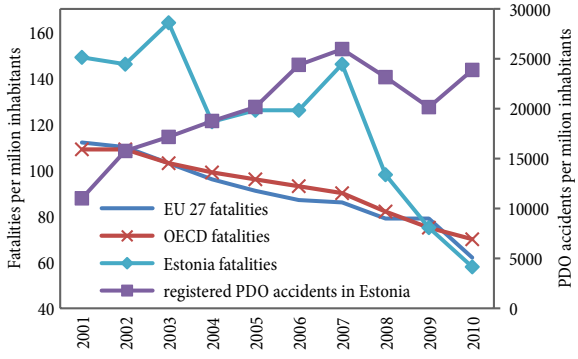

Fig. 1. Road fatalities per million inhabitants in EU, OECD Member States and Estonia compared with registered Property Damage Only (PDO) accidents (Motor Third Party Liability (MTPL) insurance cases) per million inhabitants

analyses are commonly performed in screening process of safety situation of selected part of network or road section. The general idea in that case is to use accident history to identify locations with local risk factors that

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are related to the local detailed road layout. These locations can be treated inexpensively because it is only the detailed road layout and traffic behaviour that have to be changed and not the general road layout (Elvik 2007). In case of countries with statistically small number of sever accidents (e.g. Estonia), it is more and more difficult to ensure the reliability of analyses performed by statistical methods. For instance according to the average figures of the past three years (2010–2012), 1404 traffic accidents were registered in Estonia every year where a person died or became injured. It is clearly unreasonable to group such a small number of traffic accidents by time of occurrence, main locations, situations etc. Also, differentiation between systematic and random risk factors of traffic accidents may be difficult on such grounds. Due to a statistically small number of sever traffic accidents on Estonian roads, places with at least three accidents with injured people within three years are regarded as black spots. The length of the black spots is taken 500 m and it is extended so that there is an accident-free road section of at least 500 m on both sides. As a rule, the number of traffic accidents detected on one black spot is 3÷4 per road section of less than 1 km. In 2008–2013 the maximum number of traffic accidents per one section was 10, length of road section 2.2 km (Inseneribüroo Stratum 2013). All traffic accidents were counted, their similarity and the association of the risk factors with the infrastructure was not evaluated. It is likely that if those factors were considered, the number of traffic accidents in most of the sections would decrease so much that differentiation of black spots would no longer be possible.

The situation is further complicated by the fact that Estonia is one of three European countries that does not differentiate the severity of traffic related injuries (ETSC 2009). There is no objective basis for evaluating how many of the injured people got serious injuries in road traffic accidents. According to the Estonian Traffic Insurance Fund maintaining the database of Motor Third Party Liability (MTPL) insurance cases, in 39% of the traffic accidents with injured people the expenses on treatment remain below 200 euros and 52% below 400 euros. The amounts already include the payments calculated in 2012 but payable in the future (e.g. in the situation where a person requires long-term treatment). Relatively small treatment expenses of many injured people suggest that the injuries caused in traffic accidents do not require very extensive treatment and are probably not serious. Such traffic accidents resemble rather Property Damage Only (PDO) traffic accidents than traffic accidents with serious consequences and there is no clear point to differentiate them. Based on the average figures of the past three years (2010–2012), 28246 PDO traffic accidents were registered in Estonia. The application of those figures would significantly increase the amount of information available for analysis.

According to the classic process management model, the inputs and course of the process are adjusted according to the output parameters in order to achieve the desired result. Road traffic safety management can also be viewed equally. The information, collected about traffic accidents makes it possible to identify and quantify road safety problems, evaluate the efficiency of road safety measures, determine the relevance of road safety actions and facilitate the exchange of experiences. In the event of traffic safety, the measured output mainly includes the data of traffic accidents resulting in casualties and injured people. If only the data of serious traffic accidents is used as the process output parameter in assessment and management of traffic safety, the following problems arise:

- a prerequisite for obtaining the necessary feedback for adjustment of the system is that serious traffic accidents take place;
- the higher the traffic safety level is in the observed area the less serious traffic accidents occurs per unit of time and the less sensitive is the number of serious traffic accidents as an indicator, and the longer it takes before enough information is collected about a traffic issue (e.g. for detection of a black spot of traffic accident);
- the influence of each case on the data set is great and the general picture may be influenced by cases falling to the border areas of statistical division, which may not adequately reflect the systematic risks of traffic;
- the number of traffic accidents will become statistically small, the divergence of data used for analysis will increase, and assessment of traffic safety, as well as making forecasts will become less precise.

The problems are sharper in areas where the number of serious traffic accidents is statistically very small. There are two possibilities to decrease the problem: either to carry out in-depth investigations of serious road traffic accidents and/or investigate also PDO traffic accidents and traffic conflicts in addition to serious traffic accidents.

1. Data Collected by In-Depth Investigations

The advantage of data collected by in-depth investigations is the quality and detail of the data. In-depth investigations of serious traffic accidents are usually carried out by sufficiently qualified people, the purpose for data collection is completeness, objectivity and precision to the maximum extent. It is reasonable to assume that the data collected in such a way are more precise than the information collected in the course of investigations carried out by the police or insurance providers (Hill *et al.* 2012). In the event of in-depth investigations the collection of data is the direct purpose, the police and insurance providers collect data in addition to their core activities. There is a big difference also in evaluation of the influence of risk factors. Even if the risk factor (e.g. seat belt not fastened) is identified in the work of the police or insurance provider, the influence of such a factor on the occurrence or consequences of a traffic accident is rarely assessed. In the event of in-depth investigations it is done as a rule. Thus, an in-depth investigation enables the collection of more precise and larger number of data

about a traffic accident. As a consequence of the aspects described above, data collected by in-depth investigation reflect the process of a traffic accident in complete manner, and enable qualitative analysis. This helps to improve the situation where the quantitative analysis of data is complicated or inaccurate due to a small number of cases. Based on detailed information it is also easier to differentiate systematic traffic risks from single random factors. A great advantage of relying on the data of serious traffic accidents collected by in-depth investigations is obtaining information about the reasons and occurrence of serious traffic accidents. This enables the analysis of risk factors leading to serious traffic accidents and influencing injuries.

2. Data of Property Damage Only Traffic Accidents

An advantage of data collected about PDO traffic accidents is first of all their statistically larger number, economy of organising data acquisition in comparison to in-depth investigations and the fact that data collection does not require injuries of people. In general, insurance providers or the police collect information about PDO traffic accidents. As in Estonia the police are usually not involved in the procedures related to PDO traffic accidents, and thus the information collected by the police in regard to a PDO traffic accidents is fragmented, the subsequent procedures only rely on the information collected by insurance providers in regard to MTPL insurance cases. Even though MTPL insurance cases do not include all PDO traffic accidents that have occurred, the term PDO traffic accident shall still be used for those in order to simplify reading. The advantage of investigating PDO traffic accidents and traffic conflicts in comparison to traffic accidents with injured people is the significantly larger number thereof, which simplifies conclusions based on quantitative analysis. For example, in Estonia, registered traffic accidents with injured people form in average 5% of the PDO traffic accidents, having occurred between 2010 and 2013. In areas with a small absolute number of traffic accidents the data of PDO accidents or traffic conflicts provide a good opportunity to observe changes in traffic safety and the influence of preventive measures. The occurrence of PDO traffic accidents does not depend on the risk factors that increases the level of injuries in severe accidents. Relying on the data of PDO accidents it is possible to focus on avoiding a whole accident, which is a step forward from just mitigating the consequences of it. Also, PDO traffic accidents provide direct information about the cases where nobody is injured but that still cause a significant expense to the society. As a rule, the drawbacks of using PDO traffic accidents are:

1. Complicated organisation of data acquisition:
   - data are not collected in a form allowing processing;
   - though insurance providers collect data, they do not issue those for traffic safety related activities;
   - there are many parties in possession of the information and it is difficult to reach an agreement.
2. Ensuring of data quality is complicated. As a rule, a specialist does not visit the accident scene, and the information comes from the persons involved in the traffic accidents. That:
   - causes uneven data quality;
   - makes it easier to submit false information;
   - makes it impossible to collect certain types of data (e.g. possible alcohol intoxication of drivers, speed of vehicle before the collision, etc.).
3. The total number of PDO traffic accidents is unclear, which makes it difficult to assess of the representability of the sample found in any form. In general, information is collected only for the traffic accidents of which an insurance provider or the police have been informed. It is very difficult or almost impossible to objectively determine how many PDO traffic accidents actually take place, and thus assessment of the representability of the collected data is also complicated. For instance, according to the Estonian Traffic Insurance Fund, there was 28686 MTPL insurance cases in Estonia during 2011. It is common knowledge that due to the definition of MTPL insurance case the amount of animal accidents and single vehicle accidents are there underrepresented. However, during the same year there were about 13000 such vehicle insurance cases. Thus it is likely that those are not MTPL insurance cases and it means there were at least 41686 traffic accidents in 2011. Also PDO traffic accidents are added to those, which are registered by the police but are not qualified as MTPL or vehicle insurance case, as well as events that are not registered at all.
4. The composition of PDO traffic accident data collected by insurance companies does not correspond to the composition of the data of severe traffic accidents collected by police due to a difference in the data acquisition process. E.g. as a rule there is no information in regard to the intoxication of seat belt use of the drivers involved. Also, often the classifications of indicators characterising the event are different, and therefore concurrent analysis of severe and PDO traffic accidents, as well as consideration of their peculiarities may turn out to be difficult in practice.

3. PDO Traffic Accident Data Quality

The present paper mainly focuses on the PDO traffic accident data quality by example of Estonia. From year 2001, Estonian insurance providers send information about all the MTPL insurance contracts they have concluded and MTPL insurance cases they have handled to the centralised database. The obligation coms from Estonian MTPL law (Estonian MTPL Law 2001) MTPL insurance events include all traffic accidents where loss was caused to a third person or a person was injured. Thus, all MTPL insurance cases are also traffic accidents. Even though the opposite does not apply, not all traffic accidents are MTPL cases. According to the opinion of the author MTPL cases represent the general PDO traffic accidents rather well. Only the traffic accidents where nobody was injured and where no loss was caused to

third parties and the traffic accidents where the party having caused the loss compensated the loss to the suffering party without informing the insurance provider are not represented. The following information is collected about MTPL insurance events: time and place of traffic accident, description of the traffic accident situation, details of persons having participated in traffic accident, data related to compensation of loss (how much, for what, for whom and how was compensated).

The data are collected by insurance companies and submitted to the database (Fig. 2). The data are mainly used for traffic accident risk assessment when concluding insurance contracts but they are sufficiently detailed and thus suitable also for various analyses, including analyses related to traffic safety. The key issue in using the data is precision.

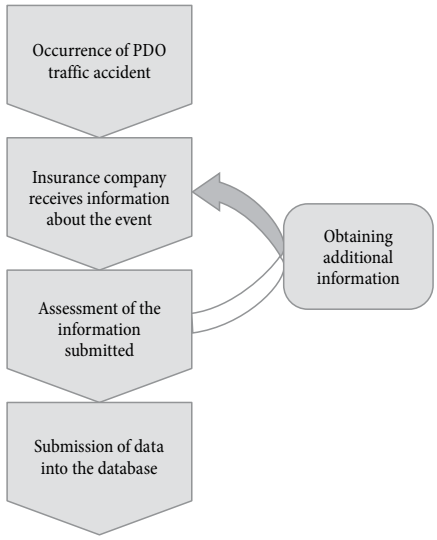

Fig. 2. Data collecting process in case of MTPL insurance cases by insurance providers

The insurance company gets first information about the event usually from accident participants. Those submit the explanations that contain description of the event and information of participated parties. The information is assessed by professional claim handler, the inspection of vehicles damages is made, the data from national vehicle register are added and additional information is obtained if necessary (e.g. roadside inspection, explanations from witnesses, recordings from roadside cameras etc.). After clarifying the event circumstances the information is submitted into the database. The data in the database has to be corrected if new relevant information occurs.

Inaccuracies in the PDO traffic accident data in the database collected in such a way may come from the following:

- traffic accident participants provide false information to the insurance company, either being unaware of it (e.g. they assess the situation in a wrong way) or knowingly (they do not wish to reveal certain facts to the insurance provider);
- the insurance company records the information in the database in the wrong way either due to a misunderstanding or another reason (e.g. carelessness);
- technical errors due to which a part of the data do not reach the centralised database or arrive there in distorted form.

The need for precision of traffic accident data is determined by the way they are used. The smaller the amount of data and/or the more detailed conclusions are desired the more precise the source data must be. It seems that the most critical analyses in regard to data precision are those carried out to determine the black spots of traffic accidents. The determination of black spots is often based on a so-called sliding window approach. This method makes use of a window moving along roads or in the room and the values of indicators characterising the traffic accidents and traffic conditions appearing in the window in every position. Black spots either at absolute or relative level, are determined according to the values. The length of the sliding window is usually in the scale of 100÷500 m for black spots and 1000 m for black sections. Traffic junctions are usually viewed as a whole (Elvik 2007). Thus, the precision of data regarding the place of traffic accident may be considered good if they remain in the same traffic junction as the actual place of the traffic accident or in the event of road sections are not in a longer distance than 100 m.

The need for precise time of traffic accident also depends on the purpose of use. In comparison of longer periods it is sufficient if a traffic accident remains in the same month with certain probability (e.g. 95%). When looking at a period of one week, the date must be within one day with sufficient likelihood. When looking at the influence for instance of traffic frequency to traffic accidents on a certain road section, it is necessary that the time of the event should be within one hour with sufficient likelihood.

4. Data Quality Inspection

The following methodology was used for data quality inspection:

- A sample was formed according to the data submitted to the database. As the precision of marking the location information was assessed to be smaller than that of the time of occurrence, the necessary sample size was determined on the basis of the precision of empirically assessed geographical coordinates. Subsequent verification confirmed the hypothesis. The sample was determined separately for the cases handled by each insurance company, and the total sample size was formed of the sum of samples of insurance companies. By calculation the number of verified cases found in such a way was $N = 575$ cases. The cases in the sample were found by random selection functions. A selection was made from among the cases where geographical coordinates were available.

– All loss adjustment materials submitted for the case were reviewed and the case data were entered into a separate register with comments.
– Differences between the data obtained by test entries and those in the traffic insurance database were analysed. Time and place of traffic accident as two indicators important from the point of view of traffic safety analyses were analysed. To evaluate the accident location data the distance between the accident location in register and the accident location determined by checking was calculated.

Data check with similar methods makes it possible to identify cases where the insurance company has entered the data in the wrong way for some reason (e.g. has not understood them correctly or has entered them incorrectly due to carelessness, etc.), and cases where the data do not correspond to the reality due to technical errors of data transmission. The methodology does not enable identification of the cases where incorrect information was submitted to the insurance company. In total, 465 cases were reviewed.

The time of traffic accident is important in traffic safety analyses, as based on that the case can be associated with risk factors (e.g. weather conditions, traffic frequency, state of the road at a certain period) or time cycles significantly altering the behaviour of people involved in traffic (e.g. weekday, holiday season, etc.). The exhaustive description of the time of a traffic accident includes the date and time.

Geographical coordinates are sufficient for determination of the place of traffic accident. Estonian insurance companies collect information about traffic insurance events locations as follows. Geoinfo is inserted to the same database with other MTPL cases data. Data is inserted by MTPL insurers' claims handlers direct to MTPL database or transferred there from insurers own databases. Coordinates are inserted as follows:

– claims handler goes to the MTPL database;
– there is a 'button', that leads claims handler to the map and the electronic map is opened; claims handler uses search engine and finds approximate place of accident; search engine can be used in 3 different modes of search: object address, names of crossing streets or name of road and the kilometre number;
– specific accident place is confirmed with mouse click;
– confirmed accident place geographical coordinates are saved in MTPL database under the claim; additionally system gives normated address of the accident place.

Inserting process is quite simple and takes approximately the same time or even less as describing the accident place in writing, what mode was used before implementing the new system. Therefore it can be believed that the change of data inserting process did not affect the data quality.

5. Results and Discussion

5.1. Time of PDO Traffic Accident

Determination of the date and time, or only the date or only the time of a traffic accident may be necessary in the analyses. Therefore all three situations were reviewed separately. The results are provided in Table 1.

Sample values were distributed very closely to normal distribution, because the normal distribution was used as the bases to evaluate the difference between the accident time in register and the accident time determined by checking.

The traffic accident time information is entered into the register in format dd.mm.yyyy hh:mm. If the time value is left empty, it shall be automatically filled with default value of 00:00. Upon checking of data it was discovered that the default value never corresponded to the reality and disregarding of the default value significantly increased data precision. In the event of about 60% of such cases the default value had been left unchanged for unknown reasons and in the event of 40% of the cases also the person having entered the information could not determine the correct time based on the data collected for the traffic accident. Date errors could be decreased by 2%, if it would be possible to enter 'unknown' (e.g. 999999) for the time of traffic accident, as can be seen from the recommendations of the European Commission (Saurabh 2013). Additionally in such an event it is necessary to consider inaccurate time information in the event of 1.6% of cases.

It may be concluded from the results that if the problems based on default value are eliminated (e.g. the default value is not considered or default values cannot be entered into the database), the information meets the quality requirements necessary for traffic safety analyses rather well, ensuring precision of time in minutes, 15% of the length of the day for date and within one hour for full time.

Table 1. Difference in the data of cases obtained from the MTPL database statement and the inspection (the figure in brackets does not consider cases with default value)

Description	Time	Date	Time with date
The time in register and time determined by checking matched	346 (345)	449	344 (343)
The time in register and time determined by checking were different	85 (48)	7	87 (50)
The actual time of the case is unknown	33 (6)	8	33 (6)
Average difference between the time in register and time determined by checking in confidence level 95% [hh:mm]	–00:49…+01:35 (–00:02…+00:04)	–00:14…+03:30	–01:25…+02:26 (–00:38…+00:20)
Standard deviation [hh:mm]	04:08 (00:36)	20:19	20:20 (05:01)

5.2. Place of PDO Traffic Accident

Traffic accident location coordinates were entered in a similar way as insurance companies did while entering data into the database. The analysis included evaluation of the locations entered into the database and found during checking. In 18 cases it was not possible to determine the traffic accident location according to the written materials collected, and no checking could be done. Even though those cases require further additional inspection, it does not automatically mean that it is wrongly entered information. It is common that the claim handler who submits information to the database have direct contact with the parties and witnesses of the event, which makes it likely that they can use more information than the person making the check.

Sample values were distributed very closely to normal distribution, because the normal distribution was used as the bases to evaluate the difference between the accident location in register and the accident location determined by checking.

The mean value of the distance between locations was 1328.1±1085.4 m, which clearly indicates a significant inaccuracy. At the same time, the table of percentiles (Table 2) shows that 50% of the differences are less than 31 m and 71% of the differences remain under 100 m. Thus, the average is mostly influenced by a small number of values with very large difference. Those were mostly based on the following factors discovered during the check:

- Inaccurately entered data due to wrong interpretation or carelessness. For example, there were cases where locations submitted to the register and detected during the check had been marked in different towns.
- Inaccuracies of base map. This was mainly associated with events where the primary search was carried out based on the kilometre and road. It was discovered that in a few events a wrong result obtained through search in such a way was most probably the reason for entering an inaccurate traffic accident location. This is a technological fault that can be avoided by quality management of the process of creation and management of a technological solution.
- Insufficient information about the exact location of traffic accident in traffic junction or parking lot. The data reflected the crossing area or parking lot where the traffic accident happened but during the check it was not possible to identify the exact location of the event. As stated above, the claim handler who submitted the information to the database may have known the exact location of the traffic accident but during the check it was not possible to identify it. It means that for a certain number of cases the information entered into the database was probably more precise than the information discovered during the check.

When viewing the practices of using the traffic accident locations in traffic safety activities, the most precise information is required for detecting black spots. Above, the authors concluded that the precision of traffic accident location information may be regarded as good if it remains in the same road junction where it actually took place or in the event of road sections is not in longer distance than 100 m. 75% of the registered traffic accident information remains within a 110.9 m radius from the location identified upon a check, and it may be regarded as of sufficient quality for analyses. The low quality of one fourth of the data is compensated by the fact that the data with insufficient quality were randomly distributed in the room. Also, the number of PDO traffic accidents occurring at black spot locations is rather large (e.g. 200 registered PDO accidents take place in the roundabout with the largest number of traffic accidents in Estonia per year). Thus it is unlikely that information with insufficient quality would influence the location of black spots and determination of black spots is also possible if 1/4 of the data is not sufficiently precise.

Table 2. Difference in the accident location data of cases obtained from the MTPL database statement and the inspection

Share of cases with a difference [%]	Precentile [m]	Share of cases with a difference [%]	Precentile [m]
10	3	70	76
20	8	80	165
30	14	90	730
40	20	99	11917
50	31	100	182258
60	45		

Nevertheless the quality of data must still be improved. There are various possibilities for that, which should be applied in complete manner. For example, it must be ensured that the base map is up-to-date, and motivation of the people entering data to enter them correctly must be increased. In regard to the data checked, one of the factors deteriorating the quality is probably also novelty of the system. Implementation of the system started in 2008, but it started to operate in its final form only in the middle of year 2009. Before the study described herein, only the quantitative indicators of entering information had been assessed, and no feedback had been provided to users in regard to data quality. It is likely that feedback to persons submitting data in combination with other measures would help to improve the quality of data significantly.

The present assessment does not include cases where incorrect information was submitted to the insurance company. Incorrect information may have been submitted accidentally or intentionally. Wrong information is intentionally submitted almost always in order to conceal insurance fraud. According to the authors it has no influence on the general precision of the data. The actual number of insurance fraud cases is unknown but it is possible to provide an evaluation with certain accuracy, relying on the number of established cases of insurance fraud. In years 2010–2012, 97, 61 and 38 cases of insurance fraud related to MTPL insurance were detected in Estonia, which could also be associated with

submission of false information regarding the objective facts about the event. That in turn makes from 0.1 to 0.3% of all MTPL insurance cases, depending on the year. Even if the actual number of insurance frauds is much higher, it is likely that the influence of intentionally submitted false information to the quality of information about traffic accidents is not significant.

It is common that the parties do not check the time at the moment of an accident, and thus not knowing the right time may be one of the reasons for unintentional submission of false information. It is only possible to establish that by observation, which is rather difficult due to the random nature of a place of traffic accidents. However, by evaluation of the authors this does not considerably influence the precision of data. It is common that immediately after an accident a mobile phone is used to inform someone of the event or ask for advice. The practice of claim handlers shows that when filling documents people often rely on the time of making the call, which is not significantly different from the moment of accident. It is unlikely that the resulting time difference significantly influences the precision of the data.

Conclusions

Property Damage Only (PDO) traffic accidents are seldom used for assessment of a traffic situation. Thereby, using this information in detection of black spots or the process of network safety management is not widespread. The reasons mainly include limited availability of the data and insufficient knowledge of the reliability thereof. The present paper is attempting to solve the latter of the problems, and assess the precision of data regarding the locations and times of PDO road traffic accidents collected by insurance providers. An application was used for collecting data about the traffic accident location, where insurance companies transformed the information describing traffic accidents into geographical information by geocoding and submitted them to the centralised database. The present paper also gives an indication of the usability of such a method in collection of data about PDO traffic accidents. The following conclusions were reached:

1. In the situation of a decreasing number of sever road traffic accidents it is important to use all available information during planning and evaluation of road traffic safety. This requires in-depth investigation in case of serious traffic accidents and inclusion of additional information describing PDO traffic accidents. As the infrastructure for systematic collection of traffic conflict data is usually insufficient, the collection of mass information should begin from the data of insurance events.
2. Data collected about PDO traffic accidents by insurance companies have certain shortcomings but the use of PDO accidents data in black spot analyses and in the planning of mitigation measures is very valuable tool in the process of black spot analyses. Based on the PDO traffic accident data collected by insurance companies it is also possible to identify locations where the direct loss related to the traffic accidents are the greatest.
3. It may be concluded from the results that despite certain inaccuracies detected in the analysed sample, it is possible to collect information about the time and locations of PDO traffic accidents with necessary precision for planning and evaluation of traffic safety. Thereby, as for any other data acquisition procedure, one must contribute to measures of ensuring data quality. That includes first of all automatic checking of the data upon entry, motivation of people entering data, etc. Also, when using data in traffic safety activities, one must consider the possible inaccuracy of those.
4. It is possible to collect information about the location of traffic insurance cases by a rather simple and thus inexpensive technological solution. At the same time, when using the data one must consider the peculiarity of data registration and quality issues thereof.

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