

Needs and Requirements of EDR for Automated Vehicles - Analysis Based on Insurance Claims Reported to Allianz Germany

Research Questions and Methodology

UNECE WP.29 faces significant challenges in formulating UN regulations for the registration, homologation and operation of automated and autonomous vehicles. The poster is based on a publication of the AZT [Gwehenberger et al., 2019].

This poster describes the contribution to the IWG EDR/DSSAD, which addresses the following three research questions:

1. What is the need for EDR data for conventional vehicles (CV) in case of accidents on motorways (mandatory in EU from 2022)?
2. What is the need for automated vehicles (AV; L3/L4) regarding EDR data in case of accidents on motorways (planned obligation for all AV)?
3. Which EDR system specifications are required to be able to clarify accidents involving automated vehicles as doubtlessly as possible?

In order to answer the first two research questions, an accident database of the Allianz Center for Technology will be considered in the following:

- In total 15,000 claims, a sample of a total of 297 accidents on motorways was analyzed in detail
- Subdivided in Third-Party-Liability material, Third-Party-Liability injuries and Motor own Damage
- Data collection in Germany from the year 2018

In order to answer the third research questions, the Top-Down Approach will be used.

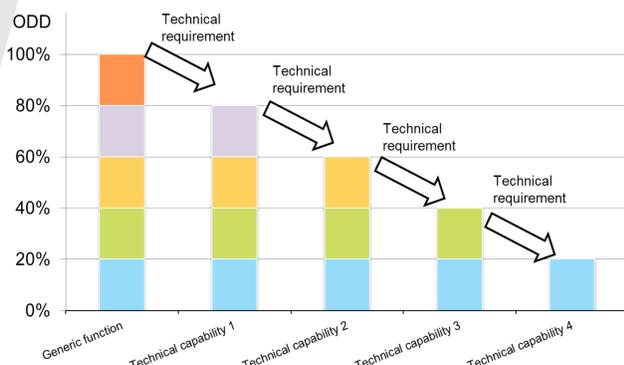


Fig. 1. Schematic Representation of the Top-Down Approach [Feig et al., 2019]

EDR Relevance

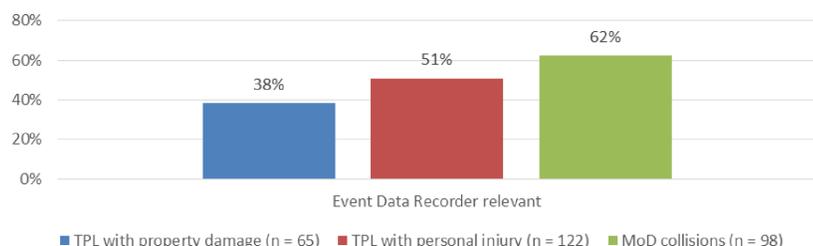


Fig. 2. Relevance of EDR Based on Insurance Claims [Braxmeier, 2019]

Answer to Research Question no. 1:

- There is a high necessity of EDR-CV, this underlines the importance of the introduction of EDR for CV in the EU in 2022

Answer to Research Question no. 2:

- The proportions of EDR-CV relevant cases form a lower limit for estimating the proportion of EDR-AV relevant cases

System Specifications and Needs Analysis

1. Surrounding with 360° cameras and sensors, Driver monitoring with cameras und sensors, Driving data and crash data
2. Surrounding with 360° cameras and sensors (front/back), Driver monitoring with cameras und sensors, Driving data and crash data
3. Surrounding with sensors, Driver monitoring with cameras und sensors, Driving data and crash data
4. Surrounding with sensors, Driver monitoring with sensors, Driving data and crash data
5. Surrounding with sensors (front/back), Driver monitoring with sensors, Driving data and crash data
6. Driver monitoring with sensors, Driving data and crash data
7. Driving data and crash data → comparable to US Standard
8. Driving data

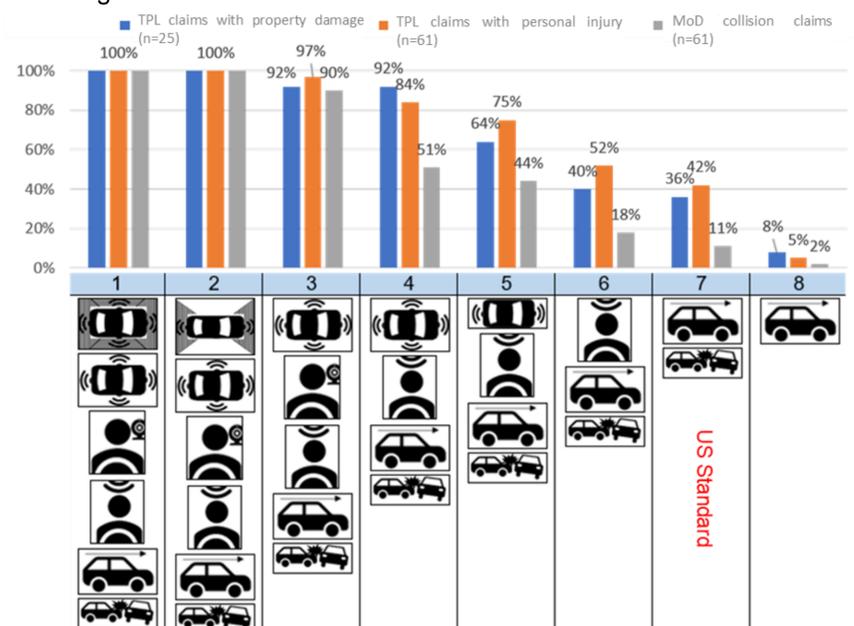


Fig. 3. Need for EDR-AV System Specifications Divided into Insurance Claims Lines [Braxmeier, 2019]

Conclusion

- A high need of EDR-CV between 38 % to 62 % has been identified for motorway accidents on the basis of insurance claims
- The obligatory introduction of EDR-CV in 2022 will certainly improve accident clarification
- Approx. 40% of the accidents with injuries could be potentially resolved with an EDR US-Standard. Remark: Is this enough for EDR-CV?
- The significant high relevance of EDR-AV shows the very high demand for such a system
- A system specification IV or even with higher performance will be necessary for EDR-AV
- In addition, a neutral Car Data Trust Center should guarantee data handling over-the-air taking into account data privacy
- Hence, an effective accident research can be installed to reach continuously the highest possible safety potential, also in terms of Vision Zero!

References:

- Braxmeier, O., Analyse des Sicherheitspotentials eines Autobahn-Chauffeurs und Bedarfsanalyse für einen DSSA/Event-Data-Recorder [Bachelorthesis], Ingolstadt, not published, 2019
 Feig, P.; Schatz, J.; Labenski, V.; Leonhardt, T., Assessment of Technical Requirements for Level 3 and Beyond Automated Driving Systems Based on Naturalistic Driving and Accident Data Analysis, Washington D.C., National Highway Traffic Safety Administration, 2019
 Gwehenberger, J.; Braxmeier, O.; Lauterwasser, C.; Kreutner, M.A.; Borrack M.; Reinkemeyer, C.; Wech, L.; Weyde, M.; Salzberger, P.; Needs and Requirements of EDR for Automated Vehicles - Analysis Based on Insurance Claims Reported to Allianz Germany, <https://wiki.unece.org/pages/viewpage.action?pageId=94047321&preview=%2F94047321%2F97648763%2FEDR-DSSAD-05-05%28Allianz%29+EDR%26DSSAD+Data+Needs.pdf>, Geneva, UNECE, 2019