

Newsletter 2021-2

DEAR READERS,

the hopes of last year's Christmas and New Year's wishes have unfortunately not been fulfilled. Corona still determines a large part of our professional, but also social and private life.

Online formats have replaced physical project meetings, conferences and business trips. Parts of this "new normal" will stay with us beyond the end of the pandemic. For all the regret that there are hardly any face-to-face meetings, small talk during coffee breaks and evening events at conferences anymore, there are definitely positive aspects as well.

The reduction in traffic resulted in decreasing numbers of fatally and seriously injured road users on German roads in 2021. In addition, emissions were saved and evenings were spent at home with the family and not hotels.

And perhaps the fact that we spent significantly less time on highways, in trains or airplanes may be one reason that the VUFO can look back on a very successful year 2021 despite all corona-related restrictions and burdens.

In addition to the "everyday business", we have become more professional in areas like project and quality management. We realized new ideas and concepts and have also grown by some employees. This newsletter informs you about selected projects, news and developments.

Nevertheless, we would like to combine our Christmas greetings once again with the wish that in the coming year we may collectively succeed in ending the pandemic and related measures.

We would like to sincerely thank all project partners, customers, authorities and stakeholders for their cooperation and support in the past year!

Best regards, on behalf of the entire VUFO team,
Henrik Liers, Uli Uhlenhof & Thomas Unger

CONTENT

DATA INVESTIGATION

Review of the accident year 2021

Cooperation agreement between the Saxon State Ministry of the Interior and VUFO

Reading electronic data from vehicles

The road towards GIDAS 4.0

DATA ANALYSIS & SIMULATION

Tool for the creation of injury risk functions / logistic regressions

Project completion of the SePIA project

Project completion of the ErVast project

Interim status of the BAST R&D project on electric micro vehicles

Publications

TRAINING AND EDUCATION

Presentation of VUFO's new branch and announcements for 2022



We wish you and your families a MERRY CHRISTMAS and a good start into 2022!

DATA INVESTIGATION

Review of the accident year 2021

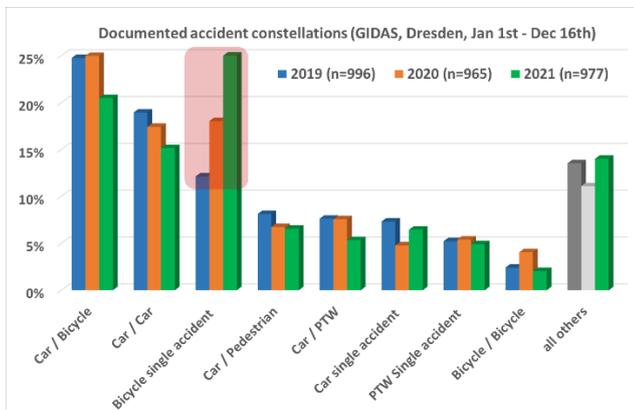
In 2021, there will be a new low in the **number of traffic fatalities in Germany**. After 2,719 people lost their lives in a road traffic accident in the previous year, forecasts for 2021 predict around 2,450 fatalities. This represents a decrease of further 10%.

The most significant reason for this sharp reduction is again likely to be the Corona pandemic and the associated decline in traffic performance. However, the steadily increasing penetration of active safety systems in the passenger car fleet may also have played a role. Above-average reductions in the number of fatalities were again observed among car occupants.

Our **GIDAS investigation team** will certainly reach the target of 1,000 documented accidents this year after 997 cases last year. The forecast is **1,010 cases**.

The change in transport modes already observed in 2020 has again led to a high number of bicycle accidents in 2021. Almost 52% of the accidents recorded so far involved a bicycle or pedelec.

There was a significant (further) increase in the number of single bicycle accidents. In 2021, they were by far the most frequent accident constellation. The graph shows the accident constellations recorded in 2019, 2020 and 2021 (unweighted, regardless of cause, 01.01.-16.12.).



Accident constellations documented by the Dresden based GIDAS investigation team in 2019 – 2021

Cooperation agreement between the Saxon State Ministry of the Interior and VUFO

The Saxon police and the Saxon Ministry of the Interior (SMI) have been among our most important partners since the beginning of traffic accident research in Dresden. Without their great support – especially, but not exclusively, at accident sites – in-depth data investigation would not be feasible at all.

We are therefore very pleased that in September 2021 we were able to seal the long-standing and constructive cooperation with an official Cooperation Agreement.



State Police President Horst Kretzschmar and VUFO Managing Director Henrik Liers after signing the Cooperation Agreement (Photo: Saxony Police / Philipp Thomas)

In addition to the support at accident scenes, the agreement also provides for further intensification of cooperation in the area of road safety. This is in the interest of both sides, as both the police and the VUFO investigation team are confronted with challenging aspects – be it new forms of mobility, the automation and connectivity of road traffic, and the need to use electronic vehicle data for analyzing accidents and their causes.

For more information about the cooperation with the Saxony Police, click here (German only):

<https://www.polizei.sachsen.de/de/83937.htm>

EDR & co. - Reading electronic data from accident vehicles

Contact: MEng. Dipl.-Ing. (FH) Erik Sinen

The research about accident causes and the analytical clarification of the pre-crash phase are substantial elements of the GIDAS project. The advancing vehicle development, especially in the field of electronics and driver assistance, increasingly challenges accident reconstruction engineers and accident experts.

As for example the intervention of controlling vehicle functions, e.g. autonomous emergency braking (AEB), has to be taken into account in the accident reconstruction, further linking facts will be necessary in the future.

To meet these requirements, VUFO began integrating electronic vehicle data collection into the accident investigation process in 2017.

In the meantime, all vehicles for which there is a realistic chance of successfully reading electronic data are investigated (if consent is given by the involved participant). The evaluation about the potential success includes the type of collision (e.g. triggering of passive safety systems), the vehicle model, and vehicle age.

In view of the future EU-wide obligation to install an Event Data Recorder (EDR), more and more manufacturers are opening the necessary interface to receive EDR protocols. Since this year, we have been using the latest generation of the Bosch CDR device (Bosch CDR 900) for readout.



Readout of an accident vehicle via OBD interface (incl. external power supply of the vehicle)

However, other data stored in the vehicle is also important for us. Some of the data in the diagnosis system (Diagnostic Trouble Codes and freeze frame data) also contains relevant information that supports accident reconstruction. The readout device used here is a universal diagnostic test device from Autel.

Since 2017, we have read electronic data from more than 120 vehicles involved in accidents. For about one third of these vehicles, we have an EDR protocol. In addition to numerous Toyota vehicles, the EDR protocol readout was also successful for VW, Audi, Skoda, Volvo, and Subaru vehicles. The vast majority of EDR protocols contained pre-crash data (from 5s to 0s).



Readout of an accident vehicle with the Bosch CDR 900 to obtain an EDR protocol

In addition, we support accident experts in the greater Dresden area with our expertise and the readout hardware available to us. We have a continuously growing wealth of experience in the collection of electronic vehicle data and offer support in the analysis and interpretation.

Since the end of 2021, it has also been possible for us to read data directly from the (removed) air-bag control module (ACM) for the brands of the Volkswagen Group, the FiatChrysler Group, and BMW.

In addition, interested parties will again have the opportunity to participate in our courses on the fundamentals of electronic vehicle data starting in spring 2022. More information on registration and course content can be found on our website under [Training](#).

The road towards GIDAS 4.0

GIDAS has been making a significant contribution to road safety for more than 20 years. Even though the scope of the investigation has been continuously revised and adapted to current conditions by the four GIDAS expert groups, it is time for a fundamental renewal. The increasing automation, connectivity, digitization, and electrification of traffic and mobility are the key factors here.

For this reason, the sponsors of the GIDAS project – the Federal Highway Research Institute (BASt) and the Research Association of Automotive Technology (FAT) – have initiated a transfer phase in the years 2020 – 2022.

During this time, only the Dresden based investigation team will continue to collect accident data on behalf of the FAT, while the BASt will advance the conception as well as the content-related and methodological development of GIDAS with more than 10 initiated research projects.

Significant revisions are sought in the areas of medicine, psychology, infrastructure, database concept, and improved vehicle and reconstruction data. The aspect of representativeness and weighting procedures will also be investigated.

VUFO accompanies this renewal process directly and indirectly in various places.

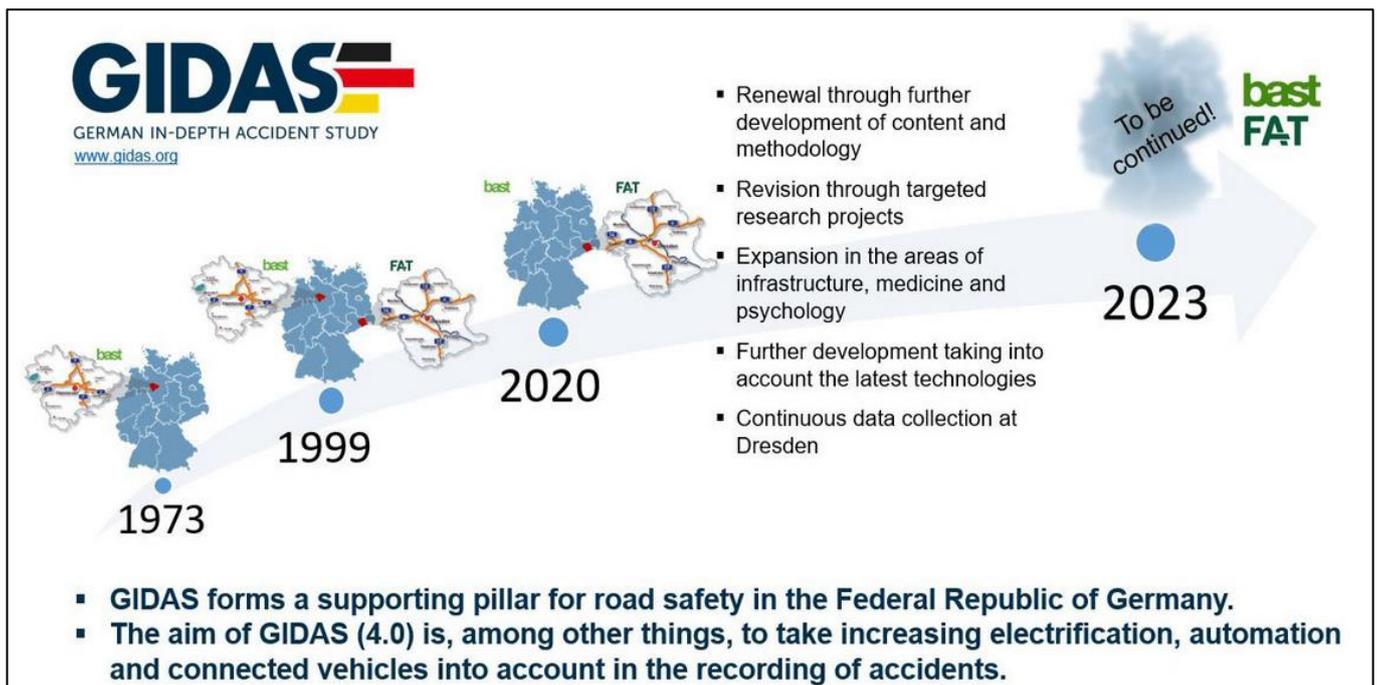
For example, we are currently working on the following R&D projects, among others:

- **FE 82.0775:** Collection of data on pre-existing conditions in GIDAS.
- **FE 82.0756/2021:** Data linking for recording vehicle equipment in GIDAS
- **FE 82.0765/2021:** Improvement of accident reconstruction in GIDAS by collecting additional linking facts and by using artificial intelligence (*subcontracted*)

In addition, experienced VUFO employees contribute to the targeted further development of the GIDAS project as members of various support groups and committees.

The aim of the efforts around GIDAS 4.0 is to investigate detailed accident data again with more than one survey team from 2023 on – how, where and with which focus has to be coordinated by the conception group consisting of BASt and FAT representatives.

For further information about GIDAS 4.0 visit www.gidas.org (English version available).



DATA ANALYSIS AND SIMULATION

Tool for the creation of injury risk functions / logistic regressions

Contact: Dipl.-Ing. Thomas Unger

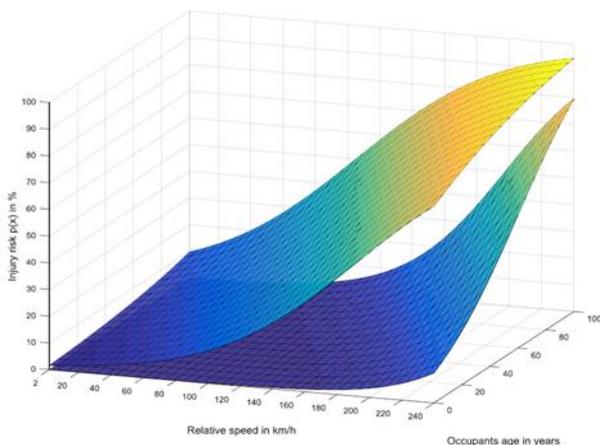
In order to make statements about relationships between technical, individual and situational accident parameters and injury severity, VUFO creates [injury risk functions](#). Based on real accident data, the probability of occurrence of a specific injury criterion is described as a function of one or more variables for a specific population. Basically, logistic regression models are used for the calculation of these functions.

For example, we use it to create injury risk functions for injury severity probability predictions for:

- Individuals (e.g., official definition of injury severity, MAIS, ISS, etc.).
- Body regions (e.g. AIS_{Head})
- Individual injuries

The developed method has so far been applied mainly to accident data from GIDAS. In general, however, other data sources or other target variables besides injury severity are also possible.

In addition to the creation of injury risk functions, we offer our customers comprehensive analysis and interpretation of the results as well as their application, for example in the context of the evaluation of active and passive safety systems.



Injury risk functions for passenger car occupants as a function of age and crash severity

Project completion of the SePIA project

Contact: Dipl.-Ing. Thomas Unger



After more than three years of operation, the SePIA project ended in September 2020.

The SePIA project (Scenario-based platform for the inspection of automated driving functions) was funded by the Sächsische Aufbaubank (SAB). Due to the pandemic, the virtual closing event took place on December 6, 2021.

VUFO performed various accident data analyses in the project. In addition, we were able to develop various approaches for determining criticality metrics or implement them on the basis of PCM data.

This enables us to calculate the TTC histories for the last five seconds before the collision for more than 10,000 PCM cases. In addition, a proprietary criticality metric known as the "driving tube criticality" has been developed.

You can find out [more about criticality](#) on our homepage (English version coming soon).

Project completion of the ErVast project

Contact: Dipl.-Ing. Thomas Unger



After two years, the BMVI-funded **ErVast** project ended as well.

ErVast stands for the "Use of dynamic traffic elements for testing automated driving functions"

The main focus of VUFO was the extraction and description of dynamic test scenarios from GIDAS. The focus was on accidents in urban areas involving passenger cars.

Based on the test scenario catalogs generated by VUFO, software or hardware tests can be parameterized in the future with regard to static and dynamic elements of the scenario.

Interim status of the BASt R&D project on electric micro vehicles

Since 2020, VUFO has been investigating the accident and traffic patterns of very small electric vehicles on behalf of BASt. Within the framework of the R&D project "**Scientific monitoring of the participation of electric micro vehicles in road traffic**", various work packages were processed in the first project year, including :

- Analysis of fleet data
- Acquisition of user characteristics
- Preparation of traffic observations
- Accident data analyses
 - based on police accident data
 - based on the in-depth data of the GIDAS database

The BASt and the Federal Ministry of Transport and Digital Infrastructure (BMVI), which is also involved in the project, recently released our first interim project report. This is available for [download](#) for interested parties (German only).

TRAINING AND EDUCATION

Presentation of VUFO's new branch and announcements for 2022

Contact: Dipl.-Ing. Thomas Unger

VUFO continues to expand the area of training and education. It is planned to strategically realign the area and intensify activities in 2022. For example, we are continuously expanding our range of training courses and seminars. With the establishment of a new position for conception and organization, we will further professionalize the area.

Our continuing education courses will begin in the spring of 2022. The three modules of the "Basic course Accident Reconstruction" will be offered in April 2022 and October 2022.

Information about available and future events can be found on our website under [Training and Education](#) (English site available soon).

We offer the following dates (subject to the Corona Protection Ordinance in effect at the time):

Publications

At this point we would like to draw your attention to a selection of our publications of this year. Since many conferences had to be postponed again due to corona, we provide the following [Publications](#) on our website:

- **Simulation as a tool for the analysis of real (accident) scenarios** (FSD Road Safety Forum)
- **Development of a EES catalog for the estimation of accident characteristics** (CTS Seminar)
- **Derivation of scenario-based test and inspection catalogs based on real accident data** (carhs SafetyUpdate)
- **Findings from accidents involving electric micro vehicles** (crash.tech)
- **A systematic approach to the objective evaluation of traffic accident databases** (ATZ, Automobiltechnische Zeitschrift, 12/2021)

- **Basic Course Accident Reconstruction, Module 1: Accident Investigation, Special Aspects & Expert Activities** Dresden, 06.04.2022 - 09.04.2022
- **Three-dimensional investigation of accident sites**, Dresden, 06.05.2022
- **Fundamentals of electronic vehicle data**, Dresden, 25.03.2022

If you do not wish to receive the newsletter in the future, please inform us briefly by e-mail to unsubscribe@vufo.de.

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You can also find news & updates about VUFO here:

