

Review of the existing national / regional activities and a proposed way forward for EDR

Deliverable to WP.29 in accordance with the ‘Revised Framework document on automated/autonomous vehicles’ (ECE/TRANS/WP.29/2019/34/Rev.1), latest revision.

European Commission

1. Review of the existing national / regional activities (European Union)

EDR research

Many previous European studies including SAMOVAR (European Commission, 1995), VERONICA-I (Schmidt-Cotta *et al.*, 2006) & VERONICA-II (Schmidt-Cotta, 2009) and the Directorate-General MOVE EDR Cost-Benefit Study (Hynd and McCarthy, 2014) have highlighted key benefits from the widespread adoption of EDRs to road safety, vehicle design, accidentology and accident reconstruction research.

In 2014, Hynd et al. showed that typical production vehicles in the US exceed the minimum legislative requirements set out by 49 CFR Part 563. For example, many vehicle manufacturers in the US chose to exceed the minimum data frequency requirements stipulated. Higher resolution data leads to improved understanding of collision events. The report also noted that in Europe, the data recorded is comparable to the specification, often with many parameters above the minimum requirement set out by Part 563.

The TRL report titled “In depth cost-effectiveness analysis of the identified measures and features regarding the way forward for EU vehicle safety” (Seidl *et al.*, 2017) was delivered for the European Commission. This report states the key requirements for EDR as follows.

“Event data recorders (EDR) record a range of vehicle data over a short timeframe before, during and after a triggering, usually by the deployment of an airbag, caused by a vehicle crash. The EDR stores critical crash-related information such as vehicle speed, state of restraints and braking systems as well as other relevant vehicle data at the time of the collision.”

In December 2020, the Commission received the report of the TRL study on Event Data Recorder (EDR) For M₁ And N₁ Vehicles.

In April 2021, the Commission received a final report of the TRL study on Heavy Vehicle Event Data Recorder (HVEDR).

EDR legislation

Under the EU General Safety Regulation (GSR) adopted in November 2019, EDR will be mandatory for new light vehicle types from July 2022 and all new light vehicles from July 2024, this will be extended to heavy vehicles from, respectively, January 2026 and January 2029.

The EDR relevant provisions are extracted below for reference.

The introduction of event data recorders storing a range of crucial anonymised vehicle data, accompanied by requirements for data range, accuracy, resolution and for its collection, storage and retrievability over a short timeframe before, during and immediately after collision (for example, triggered by the deployment of an airbag) is a valuable step in obtaining more accurate, in-depth accident data. All motor vehicles should therefore be required to be equipped with such recorders. Those recorders should be capable of recording and storing data in such a way that the data can only be used by Member States to conduct road safety analysis and assess the effectiveness of specific measures taken without the possibility of identifying the owner or the holder of a particular vehicle on the basis of the stored data. (Recital 13)

'Event Data Recorder' means a system with the only purpose of recording and storing critical crash-related parameters and information shortly before, during and immediately after a collision. (Article 3(13))

Motor vehicles shall be equipped with the following advanced vehicle systems: (...) (g) event data recorder. (Article 6.1)

Event data recorders shall meet the following requirements in particular:

(a) the data that they are capable of recording and storing with respect of the period shortly before, during and immediately after a collision shall include the vehicle's speed, braking, position and tilt of the vehicle on the road, the state and rate of activation of all its safety systems, 112-based eCall in-vehicle system, brake activation and relevant input parameters of the on-board active safety and accident avoidance systems, with high level of accuracy and ensured survivability of data;

(b) they cannot be deactivated;

(c) the way in which they are capable of recording and storing data shall be such that:

(i) they operate on a closed-loop system;

(ii) the data that they collect is anonymised and protected against manipulation and misuse; and

(iii) the data that they collect enables precise vehicle type, variant and version, and in particular the active safety and accident avoidance systems fitted to the vehicle, to be identified; and

(d) the data that they are capable of recording can be made available to national authorities, on the basis of Union or national law, only for the purpose of accident research and analysis, including for the purposes of type approval of systems and components and in compliance with Regulation (EU) 2016/679, over a standardised interface. (Article 6.4)

An event data recorder shall not be capable of recording and storing the last four digits of the vehicle indicator section of the vehicle identification number or any other information which could allow the individual vehicle itself, its owner or holder, to be identified. (Article 6.5).

Furthermore, Article 11 of the GSR requires the Commission to adopt provisions concerning uniform procedures and technical specifications for EDR for automated vehicles.

On 26 January 2022 the Commission adopted a Delegated Regulation on EDR, meant to apply to new types of M₁ and N₁ vehicles as from 6 July 2022.

2. Way forward for EDR in the UNECE

In line with the General Safety Regulation, the objective of the Commission is to achieve high level of harmonisation among the Parties, based on the text stipulating the collection and in-vehicle storage of a wide range of collision related data elements, for both conventional and automated vehicles. After the endorsement of the UN Regulation 160 by the WP29 in March 2021 and the subsequent agreement on the revision of UN Regulation 157 to ensure the availability of ALKS-related EDR data, the UNECE

work should continue, notably with a view of endorsement of the UNECE rules on EDR for Heavy Vehicles by March 2023 (as a priority).

China

1. Review of the existing national / regional activities

China has completed the draft national mandatory standard of EDR for approval. The Chinese EDR standard would be issued soon.

The implementation of Chinese EDR standard takes 2-step strategy:

- 1). For vehicle type applying for new type approval, all requirements except for Level B data elements and data retrieval shall be implemented since 1st January 2021; all requirements shall be implemented since 1st January 2023.
- 2) For vehicle types granted with type approval before 1st January 2021 are only required recording partial data elements specified in the standard since 1st January 2021.

2. Way forward for EDR

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France

1. Review of the existing national / regional activities

No requirements at that time

2. Way forward for EDR

FR expectations for mandatory EDR

In addition to what is indicated in the table with regards item to be stored, France would like to raise the following points:

- Importance of localisation: it seems essential to us because:
 - the global studies will need this info to characterize the accident area (turn, summit of a hill, double lane) and this would make it possible to respond to lines 134, 135 and 137 at least partially.
 - Useful in the event of an investigation to find out whether the vehicle has been the subject of a jammer or GPS Spoofing attack
- Additional item to be stored by EDR:
 - Infotainment system activities (phone call running, sms reception on screen, vocal sms elaboration, etc.)
- With regards locally stored data
 - access via an easily accessible universal port (OBD)
 - ideally in a specific box with a standardized and universal communication port
 - manufacturers will have to provide protocols allowing access to data via the port provided for this purpose (OBD)
 - suppliers will have to provide the protocols for direct access to the data on ECU concerned in order to compensate for cases where the CAN network of the vehicle is

not available (not working or destroyed in crash) (which again pushes to adopt the universal single box)

The interest would thus be to have a box with a standardized connection, a possible extraction for example via a USB port, which would avoid the manufacturer to provide information on its CAN frames.

Germany

1. Review of the existing national / regional activities

In Germany, accident research is currently based on the evaluation of accident recordings by official bodies and state and civil accident research. Of particular note here is the GIDAS project (German In-Depth Accident Study), the largest in-depth accident data collection in Germany. But, even in this project EDR data is not read and analysed by default due to the comparable small number of installed devices as well as data access and reading limitations.

2. Way forward for EDR

According to the European General Safety Regulation an EDR is required in all new vehicles of category M1 and N1 by 2022 and all new vehicles of categories M2, M3, N2 and N3 by 2026. Accordingly, Germany will collect first EDR data in 2022 and will start evaluating this information in a first phase (i.e., among others check for its quality and consistency etc.).

Currently, it is believed that the number and kind of data elements will likely change for all vehicles over time.

It is intended to support a research project aiming to evaluate existing and developing new EDR triggers (e.g., to trigger soft-object collisions and safety-critical events).

Japan

1. Review of the existing national / regional activities

Japan incorporated the UN Regulation No.160 into the national legislation on 30 September 2021 and made it mandatory to install the EDR for the vehicles of categories M1 and N1 whose type is newly approved in Japan on and after 1 July 2022 or which are manufactured on and after 1 July 2026.

2. Way forward for EDR

Japan plans to incorporate the 01 series of UN Regulation No.160 on 22 June 2022.

Japan also has an intention to incorporate the new regulation for HDV EDR when it is developed under the WP. 29 and Japan will continue to support such WP. 29 activities including the work for the revisions of the existing regulations for EDR.

Republic of Korea

1. Review of the existing national / regional activities

Korea has established and implemented standards since 2015

- MOTOR VEHICLE MANAGEMENT ACT, Article 29-3 (Installation of Accident Recording Devices and Provision of Information)
- Standards for installing event data recorder
- Notify the buyer that the event data recorder is installed in the car
- Automobile manufacturers shall provide recorded accident data when automobile owners and related organizations request accident record data.

Way forward for EDR

Korea will carry out automated driving development innovation projects for seven years from 2021.

- The automated driving project includes research on EDR and DSSAD of automated vehicles. The project aims to introduce a new domestic system for EDR and DSSAD of automated vehicles.

Netherlands

1. Review of the existing national / regional activities

EDR National activities of the Netherlands

- **Accident Reconstruction and Analysis.** By national authorities like National Forensic Institute, Police VOA (Traffic Incident Analysis), Rijkswaterstaat (Road Management Authority), RDW (Registration and Type Approval Authority), SWOV (Scientific Research traffic Incidents).
- **Fraud investigation.** Fraud investigation by insurance companies and RDW.

2. Way forward for EDR

Way forward for EDR of the Netherlands

- Since Motorcycles are involved in a lot of accidents, the Netherlands would like to extend the scope of the EDR with motorcycles as soon as possible.
- Since pedestrians and cyclists are involved in a lot of accidents, the Netherlands would like to extend the scope of the EDR with pedestrians and cyclists as soon as possible.

United Kingdom

1. Review of the existing national / regional activities

The UK activity on EDR relates to the regulation being discussed at the UNECE. We are engaged with authorities to understand the nature of information that may be useful for collision investigations.

2. Way forward for EDR

- The UK supports the expansion of EDR for use with HGV. There may be additional data products that are relevant for HGVs that are not present under the current provisions.
- The EDR should collect already identified data elements which the UK sees are relevant to collisions with vulnerable road users e.g. status of ACSF and TPMS.

- EDR for AVs should focus on data elements specific to the functioning of an ADS to aid in crash investigations. The EDR should be supported in this by the DSSAD data but should not be replicated by it.

United States of America

1. Review of the existing national / regional activities

List of the domestic EDR activities in the United States:

- The National Highway Traffic Safety Administration (NHTSA) is conducting an Event Data Recorder Duration study, which is required by Section 24303(a) of the Fixing America's Surface Transportation Act (FAST Act).
- Section 24303(b) of FAST Act requires that NHTSA conduct a rulemaking to “establish the appropriate period during which event data recorders installed in passenger motor vehicles may capture and record for retrieval vehicle-related data.” NHTSA is in the process of developing this proposal.
- NHTSA has researched issues regarding Heavy Vehicle EDRs, and that report is currently under agency review.
- SAE International is working on developing a standard(s) for data loggers (which, at this point, appear to be more similar to EDRs than DSSAD)