

CARE Expert Meeting Group
6 November 2026

Automating Crash Data Collection
Draft Recommendation Paper

George Yannis, Professor NTUA
Dimitris Nikolaou, Research Associate NTUA
Paolo Bolsi, European Commission, DG MOVE

European Commission

CONTEXT

Purpose of the paper

How new digital systems – geolocation in particular – can improve the way crash data is collected, linked and used, making road crash statistics more useful and timely at national and EU level.

1

Starting point

CARE experts reviewed the CARE variables for relevance, availability and consistency.

2

What the Review found

Limits in current reporting practice, and scope to derive data through geolocation and existing national databases.

3

What this paper offers

Forward-looking suggestions, as a basis for discussion at Member State level – read alongside Sections 8.5 and 8.8 of the Review Report.

CONTEXT

Today: manual reporting at the roadside

Most road-related variables are still recorded by hand by the reporting police officer – sometimes from memory, or from paper forms at the crash location.

Officer time

Manual entry takes valuable time during and after an already demanding task.

Unknown and inconsistent values

Several road variables carry significant shares of unknown or inconsistent values.

Cross-country discrepancies

Local definitions and individual judgement lead to differences between countries.

FOUR DATA SOURCES

Four data sources, one crash record

Geolocation

Crash coordinates from the officer's device, a connected vehicle or eCall

Road geometry

Coordinates linked to road registries, OpenStreetMap or commercial maps

Vehicle registry

Plate number captured at the scene triggers a registry look-up

Licence registry

Licence number captured at the scene triggers a registry look-up

One integrated crash record

Existing attributes are populated automatically; the officer records and validates the crash-specific facts.

GEOLOCATION & ROAD GEOMETRY

Geolocation: one capture, two levels

CAPTURE

A pair of coordinates

From the officer's device, a connected vehicle or eCall – pinned to an exact point on the map, however well the road is known.

LEVEL 1

Direct calculation

Simple calculations, no live database link. Nothing needed beyond accurate positioning.

- A-4 NUTS
- A-5 LAU
- R-3 E-Road
- R-4 E-Road Kilometre

LEVEL 2

Road-geometry linkage

Coordinates connected to national road registries, OpenStreetMap or commercial map providers.

- Many existing road variables
- Genuinely new variables

GEOLOCATION & ROAD GEOMETRY

Road variables derived automatically

Existing CARE variables, via road-geometry linkage

R-5 / R-6 Function Class	**R-9 / R-10** Speed Limit	**R-11** Motorway	**R-12** Urban Area	**R-13** Accident at Junction
R-18 Carriageway Type	**R-19** Number of Lanes	**R-22** Tunnel	**R-23** Bridge	**R-25** Curve

New variables, only practical to collect this way

Median · Barrier · Sidewalk · Cycle lane · Lane width · Shoulder width

VEHICLE REGISTRY

Linking crash records to vehicle registries

Plate number captured → Registry look-up → Attributes returned

Variable	What registry linkage changes
U-8 Vehicle Make & U-9 Model	Retained only if linked to registration data
U-5 Vehicle Engine Power	Kept rather than removed: no longer burdensome
U-18 Motorisation (proposed)	Electric, hybrid, diesel, petrol, natural gas
Coherence check	Registered vs reported data: errors caught at source
Safety technologies	A future direction: ADAS, autonomous driving systems

Needs interoperability between the police reporting system and the national vehicle registry – a national undertaking, with building blocks already in place in most Member States.

DRIVER LICENCE REGISTRY

Linking crash records to driver licence registries

Licence no. captured → Registry look-up → Driver data returned

Variable	What registry linkage changes
Age, gender, licence category and validity, penalty or conviction history	Taken from the registry, not from the driver's own account or a paper licence
P-13 Driving Licence Validity	"No licence presented" vs "invalid (or no) licence" settled as fact, not interpretation
P-8 Alcohol Sample Type · P-10 Alcohol Level · P-11 Drug Test	Driver's administrative record cross-referenced with the roadside test result

DRIVER LICENCE REGISTRY

Data protection by design

Driver licence look-ups raise more sensitive questions than vehicle look-ups: they touch identifiable personal data and, in some Member States, criminal or administrative history.

Built in from the outset

Interoperability work designed with data protection in mind from day one.

With national authorities

In coordination with national data protection authorities.

Statistical anonymisation

Methods such as “fuzzy matching” to anonymise personal characteristics.

THE FUTURE MODEL

Towards a largely automated reporting model

The officer records

- What happened
- The sequence of events
- Contributing factors
- Injuries
- Variables needing expert judgement on site

Populated automatically

- The road's characteristics
- The vehicle's registration record
- The driver's licence status

… at the moment the report is created, not re-keyed from memory

Faster for the officer | **Less transcription and recall error** | **No new data to collect** | **Much higher reliability**

THE FUTURE MODEL

Connected vehicles: the longer-term horizon

Less immediate, but increasingly plausible with a cooperation framework with vehicle manufacturers: drawing on data the vehicle itself already generates.

Sources in place

eCall, connected-vehicle telematics and smartphone positioning already give accurate crash coordinates in several countries.

What they could add

Pre-crash speed, braking and impact data, straight from the vehicle rather than officer estimation.

What it would take

Real-time interoperability with vehicle-side data, touching manufacturer and telecom systems.

THE FUTURE MODEL

The Working Group's recommended path

TODAY

Manual reporting

Road, vehicle and driver attributes keyed in by the officer.

MEDIUM TERM

Registry and geometry linkage

The achievable target: road-geometry, vehicle and driver licence registries.

LONGER TERM

Connected-vehicle data

A direction to monitor: eCall, telematics and on-board crash data.

Run any transition in parallel with existing reporting, to allow validation before older variables are retired.

FROM DATA TO VALUE

Four benefits of automation

Cost

Extra variables at little or no marginal collection cost, and fewer quality-checking costs for Statistical Authorities.

Reliability

No recall error, illegible handwriting or inconsistent local judgement in auto-populated fields.

More and richer variables

Far more than manual collection could justify, including new road-geometry variables and U-18 Motorisation.

Timeliness

Near-real-time crash mapping and faster feedback to infrastructure managers and policy makers.

THE QUESTION SHIFTS

From "which variables can we afford to collect?"

to "which available variables are useful for road safety analysis?"

Geometry- and registry-derived variables are computed the same way in every country – strengthening cross-country comparability.

FROM DATA TO VALUE

A new CAREplus data protocol

Automatically derived variables

Geolocation, road geometry, vehicle and driver licence registries

Manually reported variables

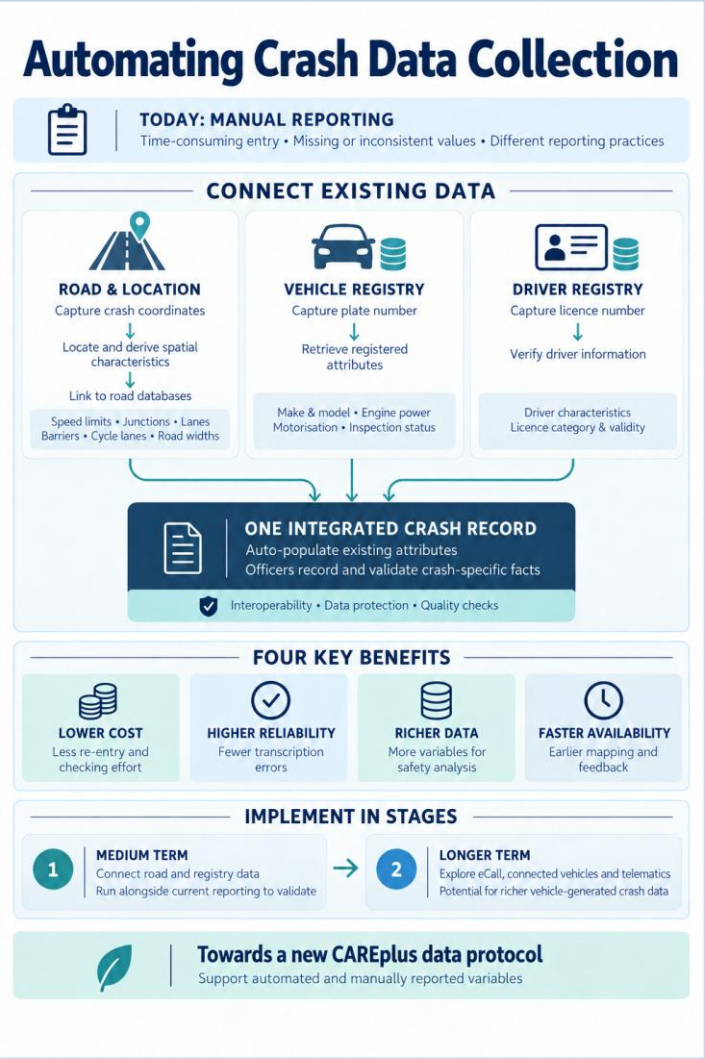
Crash-specific facts recorded by the officer

CAREplus data protocol

Handles both kinds of variables. Its scope evolves with the new data reliability.

CARE database

Richer, more reliable and timelier crash data



SUMMARY

The recommendations at a glance

1. Capture coordinates, plate number and licence number once, at the scene.
2. Link them to road-geometry, vehicle and driver licence registries.
3. Let officers focus on the crash-specific facts.
4. Medium term: registry and geometry linkage. Longer term: connected-vehicle data.
5. Support derived and reported variables in a new CAREplus protocol.



CARE Expert Meeting Group
6 November 2026

Automating Crash Data Collection
Draft Recommendation Paper

George Yannis, Professor NTUA
Dimitris Nikolaou, Research Associate NTUA
Paolo Bolsi, European Commission, DG MOVE

European Commission