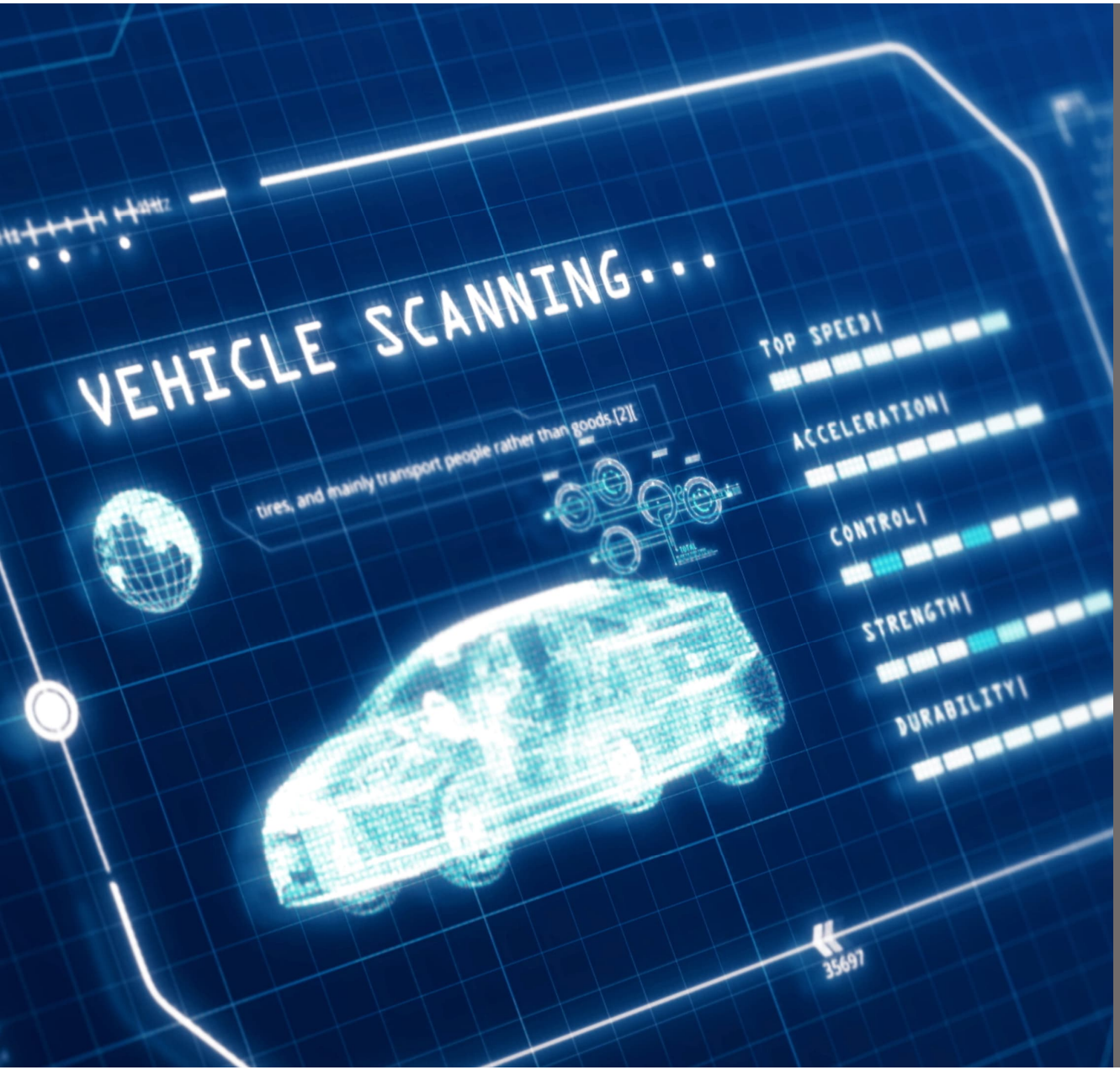

THE FUTURE OF TRANSPORT

SoRSA – Workshop 2024

The hidden truth: In-vehicle data in collision investigation

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Technical Lead

About TRL

Vision

World leader in creating the future of transport and mobility, using evidence-based solutions and innovative thinking

>200

engineers, scientists, psychologists, IT experts and statisticians

Providing world-leading research, technology and software solutions for surface transport modes and the related markets of automotive, motorsport, insurance and energy

Mission

Challenge and influence our chosen markets, driving sustained reductions (ultimately to zero) in:

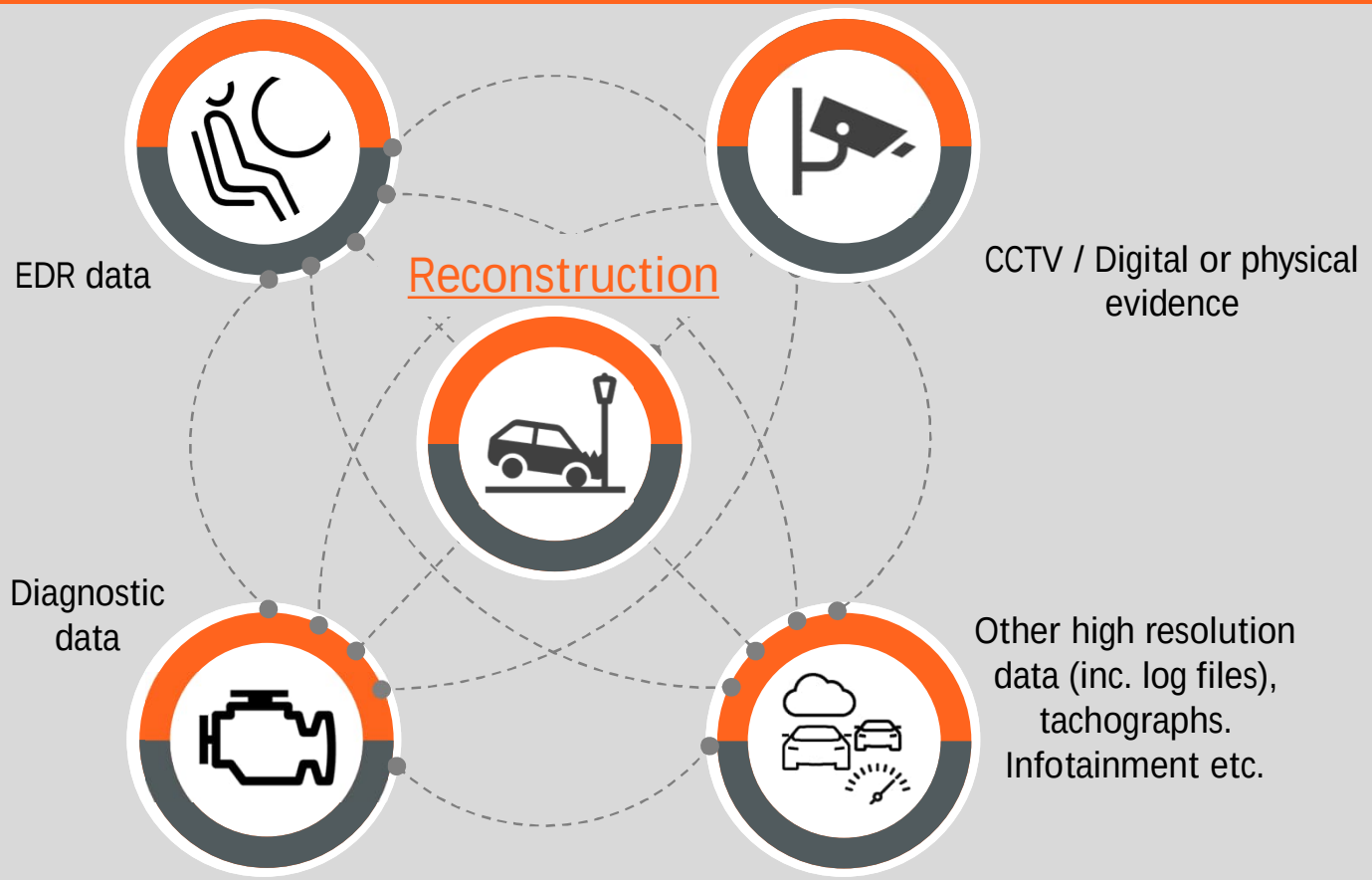
- Fatalities and serious injuries
- Harmful emissions
- Barriers to inclusive mobility
- Unforeseen delays
- Cost inefficiencies

1000 clients in

145 countries

Why do we need data?

The real benefit: cross validation of hypotheses giving a more reliable reconstruction

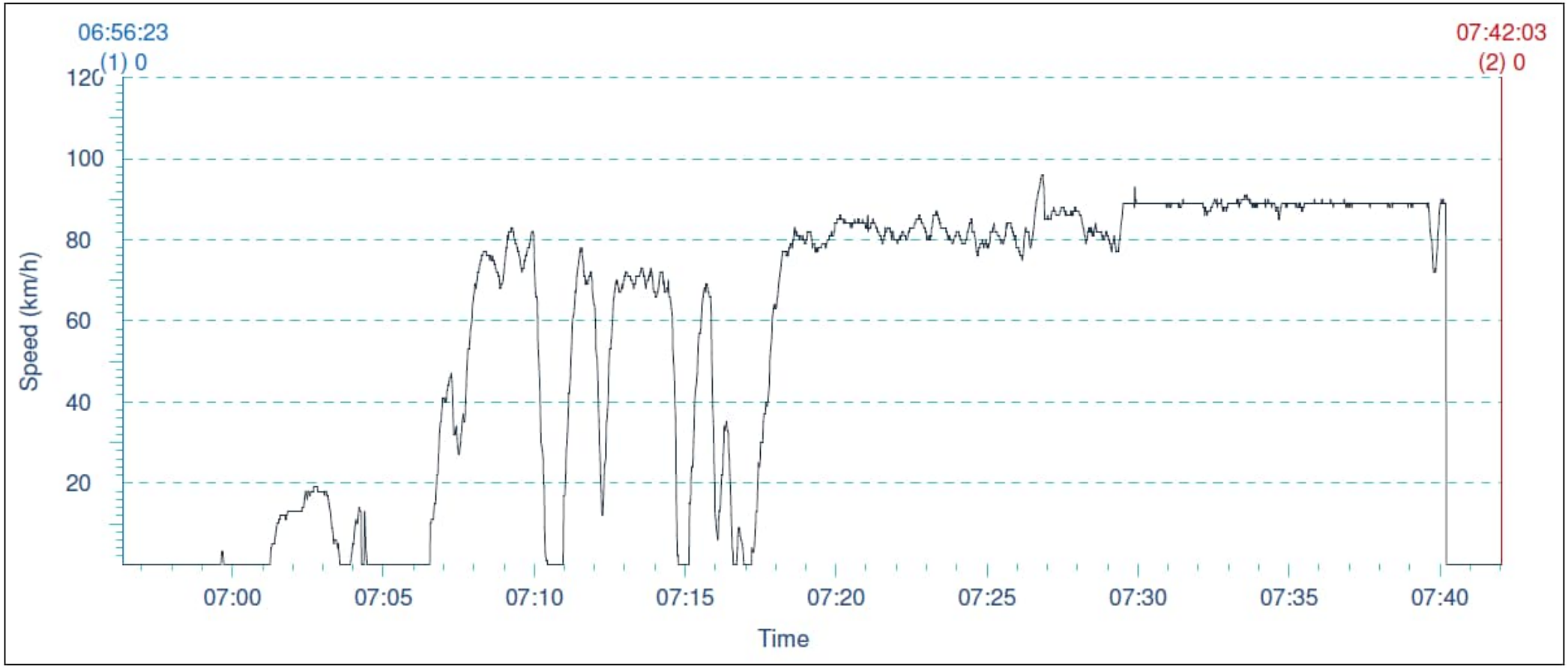


Uncovering the truth: the need for multiple sources of data

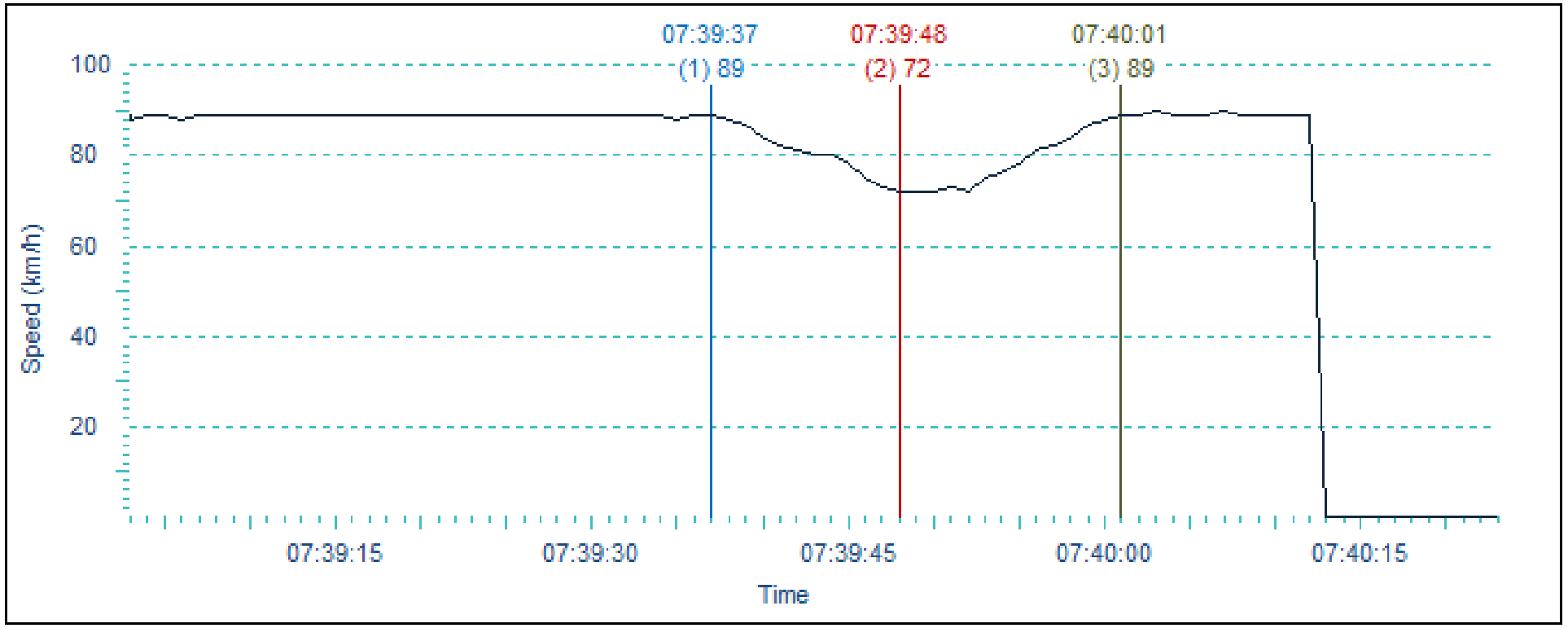
A case study

Fatal road traffic collision involving three goods vehicles.

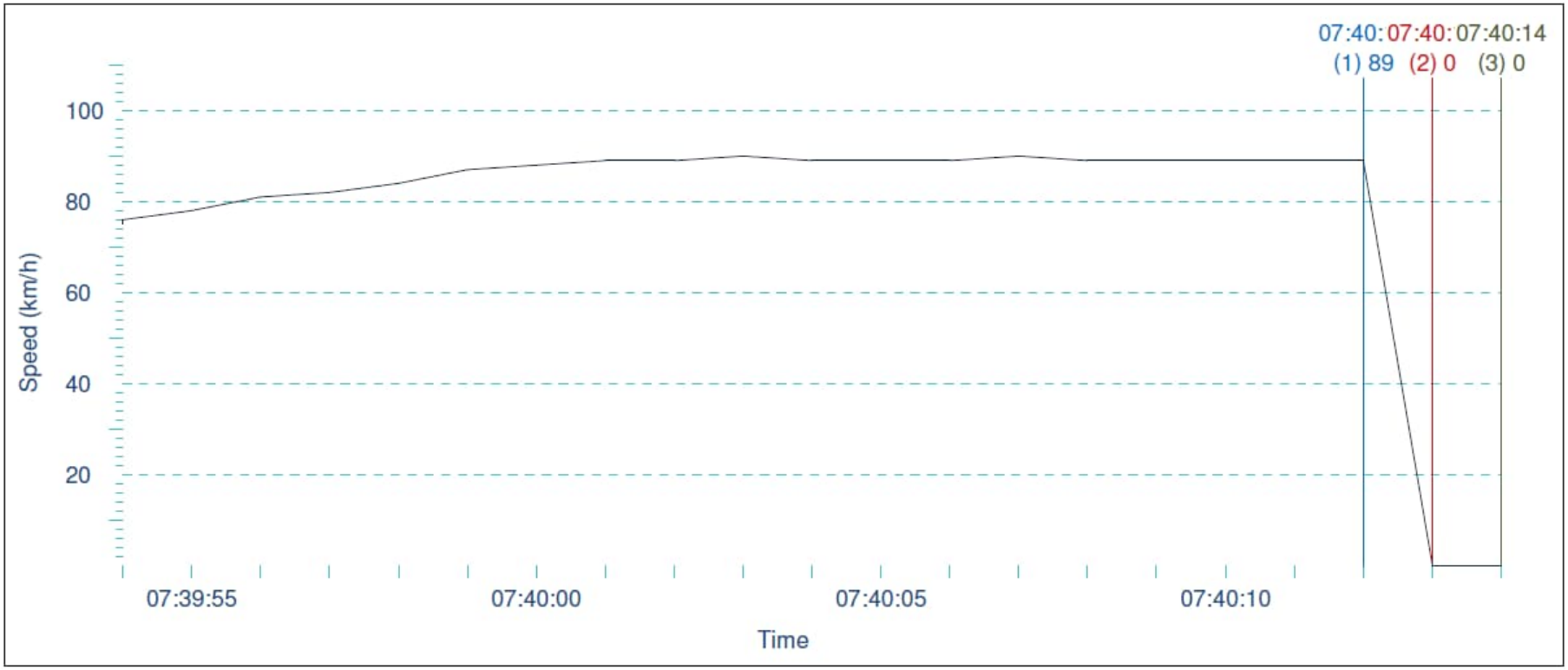
Case study – 3 vehicle RTC – Vehicle 1



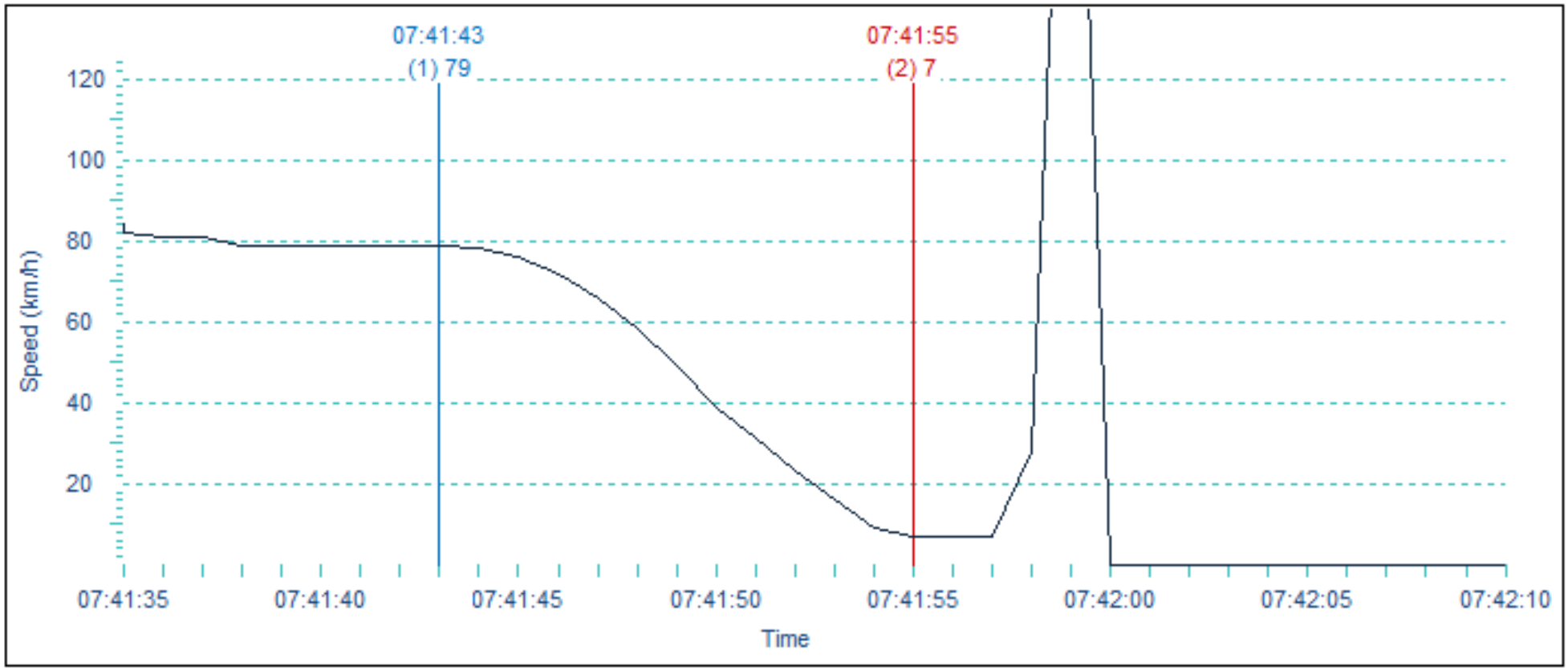
Case study – 3 vehicle RTC – Vehicle 1



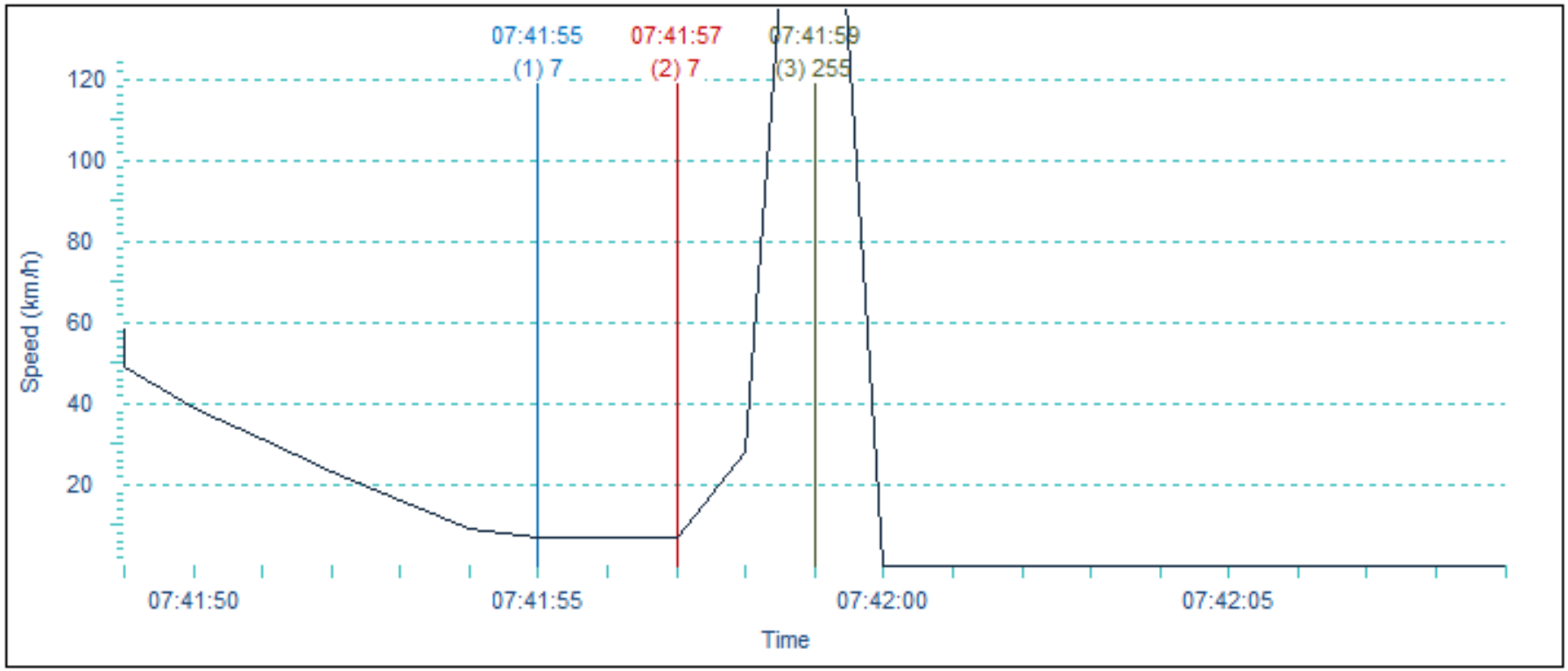
Case study – 3 vehicle RTC – Vehicle 1



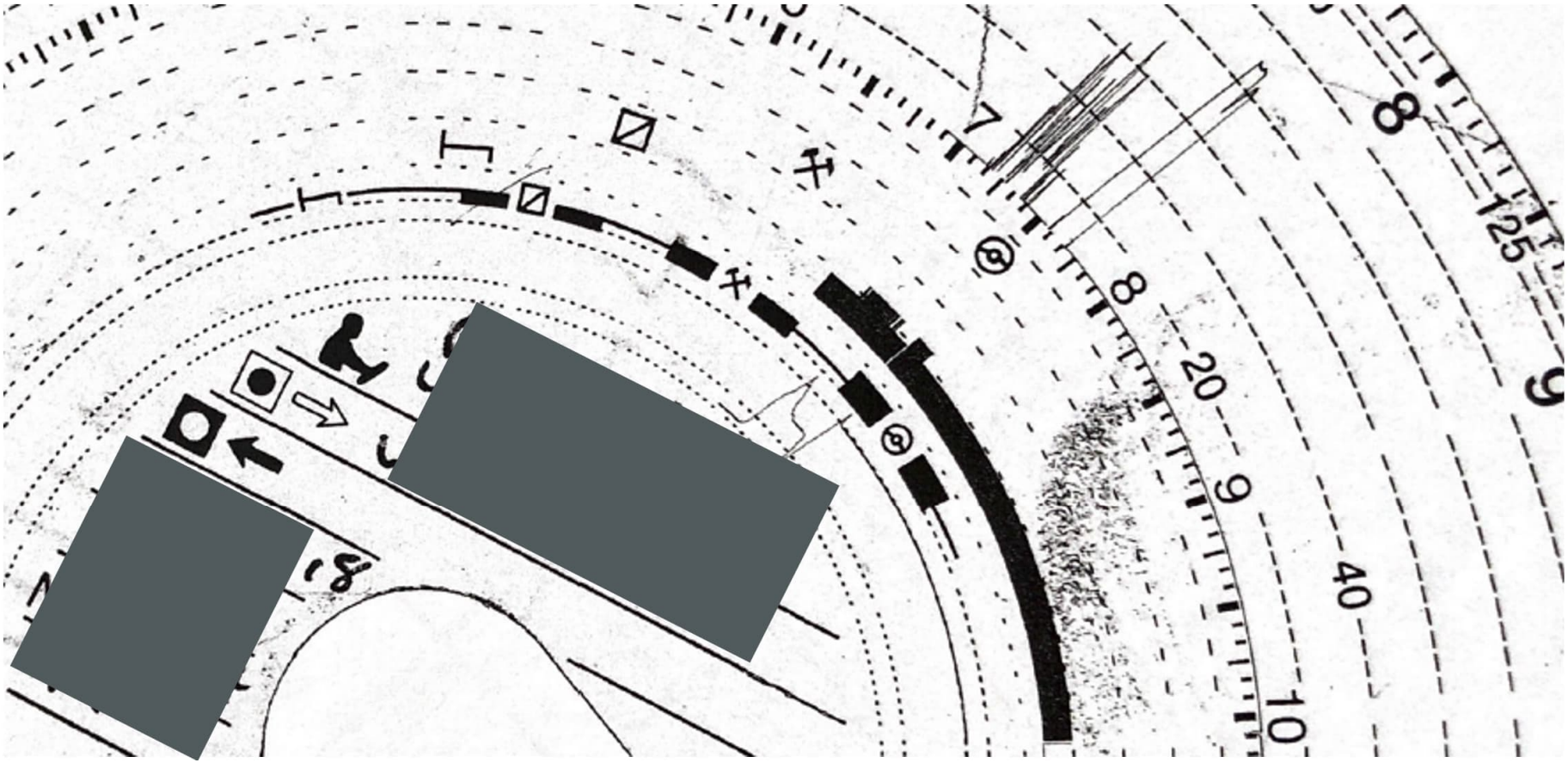
Case study – 3 vehicle RTC – Vehicle 2



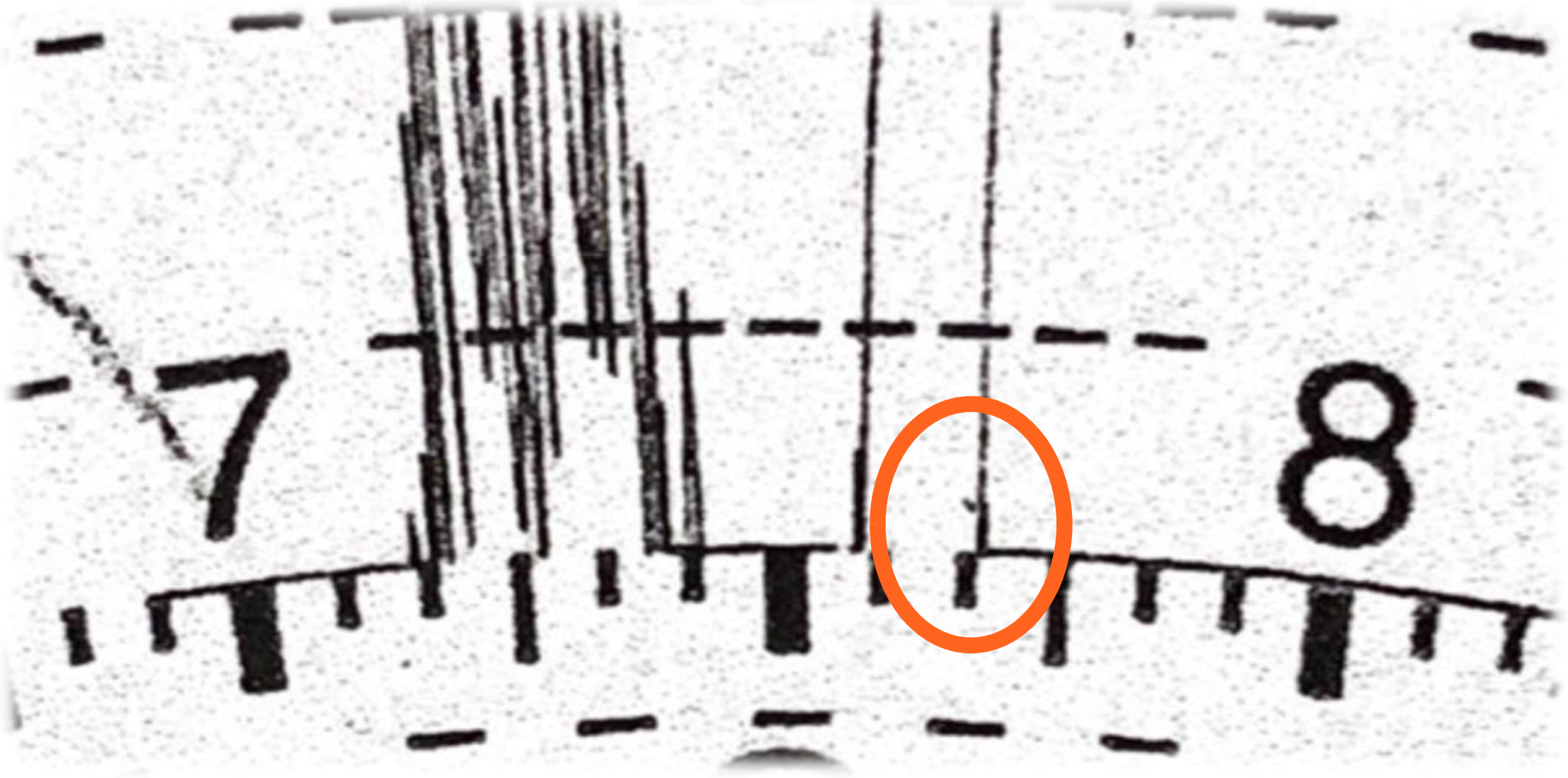
Case study – 3 vehicle RTC – Vehicle 2



Case study – 3 vehicle RTC – Vehicle 3



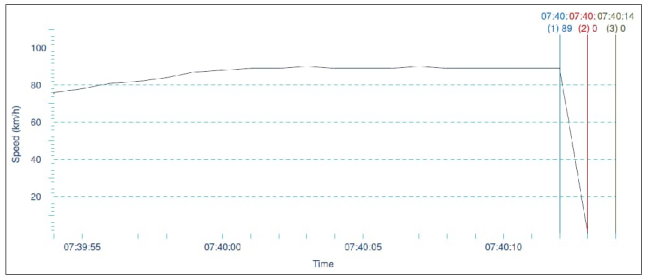
Case study – 3 vehicle RTC – Vehicle 3



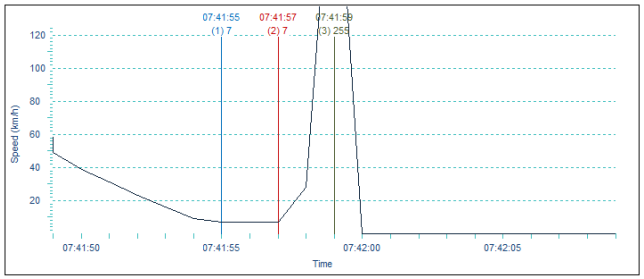
Tachograph analysis

Bringing all the tachograph data together

1



2



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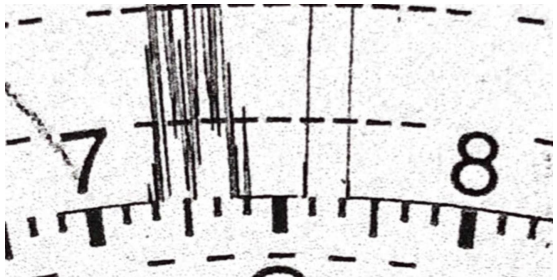


Other sources of data

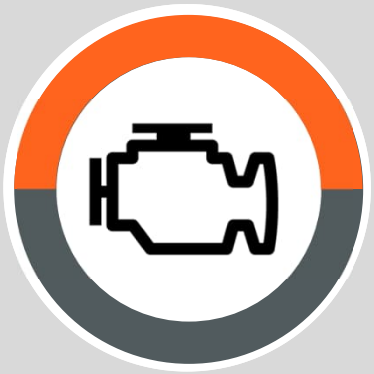
- Infotainment data
- Insurer/fleet tracking telematics
- Incident/Event/Collision data recorder (IDR, EDR, CDR, UDS)
- ‘Freeze frame’ data
- ECU download
- In vehicle cameras (dashcam / rear view)
- Future systems – eCall / CDR

Other sources of data - commercial & non-commercial

Other sources of data - commercial

Non-goods vehicle data

Main types of data used in collision investigation (also Infotainment data!)



Diagnostic data

- Easy to obtain
- In-depth freeze frame data is less easy to assess
- Low quality data

Bosch CDR

- Access is improving following recent regulatory changes
- Easy to download (with access)
- Some compatibility problems
- High-quality data (*CI focus*)

Log file (manufacturer) data

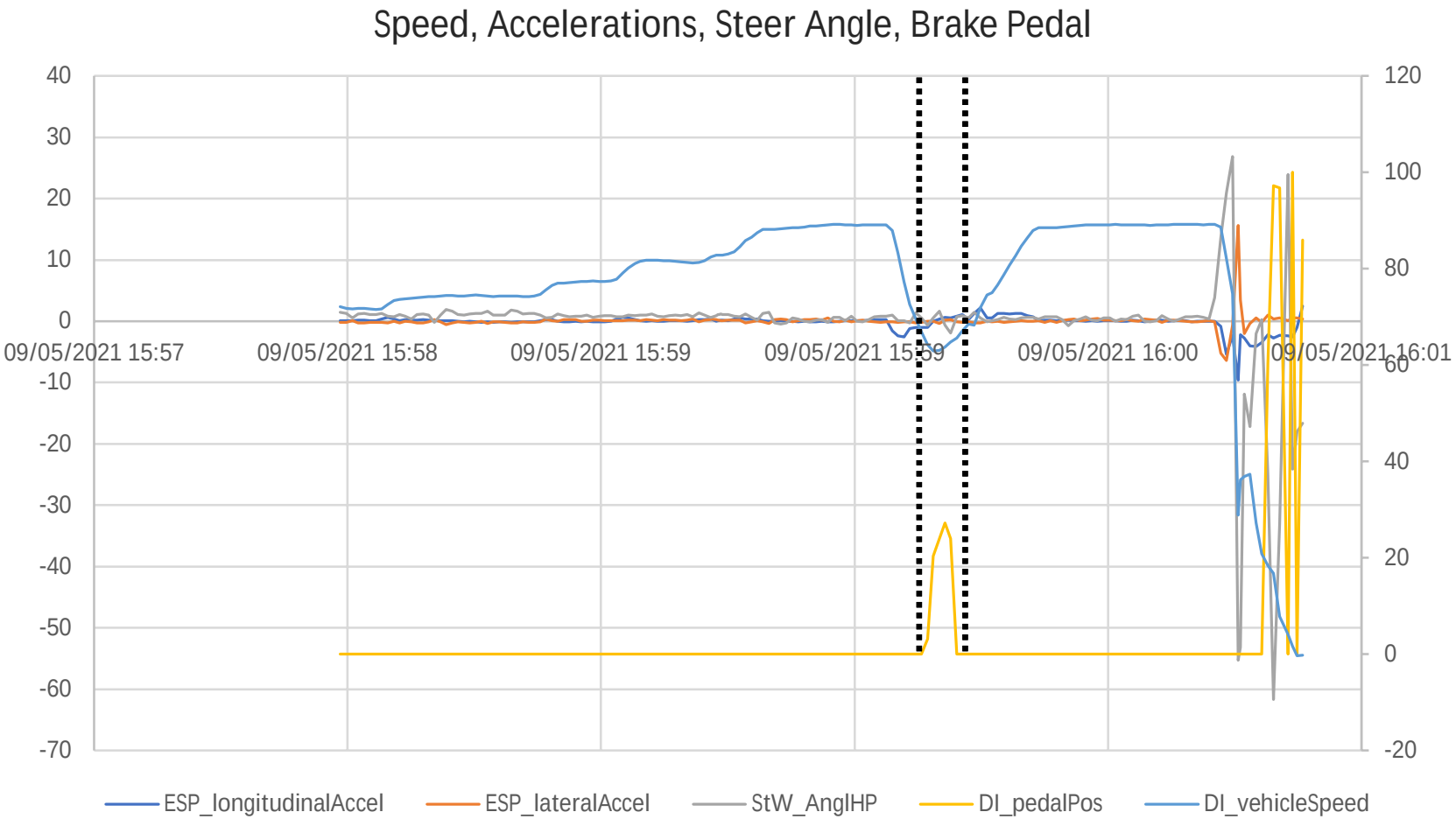
- Access is problematic
- Limited knowledge of data availability & data categories
- Can include dashcam footage
- High-quality data (*non-CI focus*)

Other data - Log files

Deep dive into potential sources of in-vehicle data

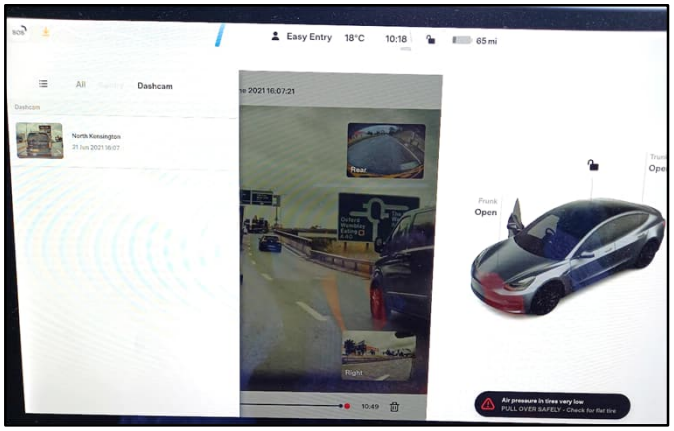
Log file data

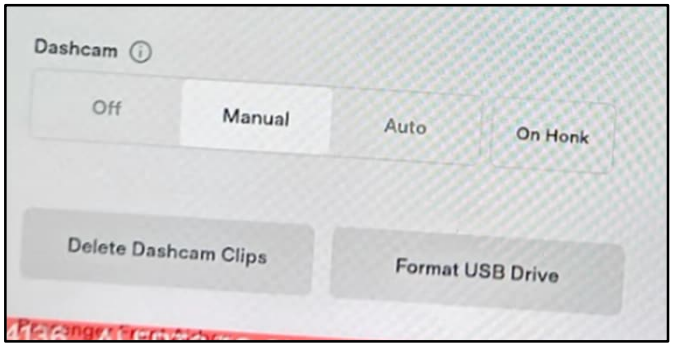
Outcomes: vehicle dynamics data



Infotainment / log file data

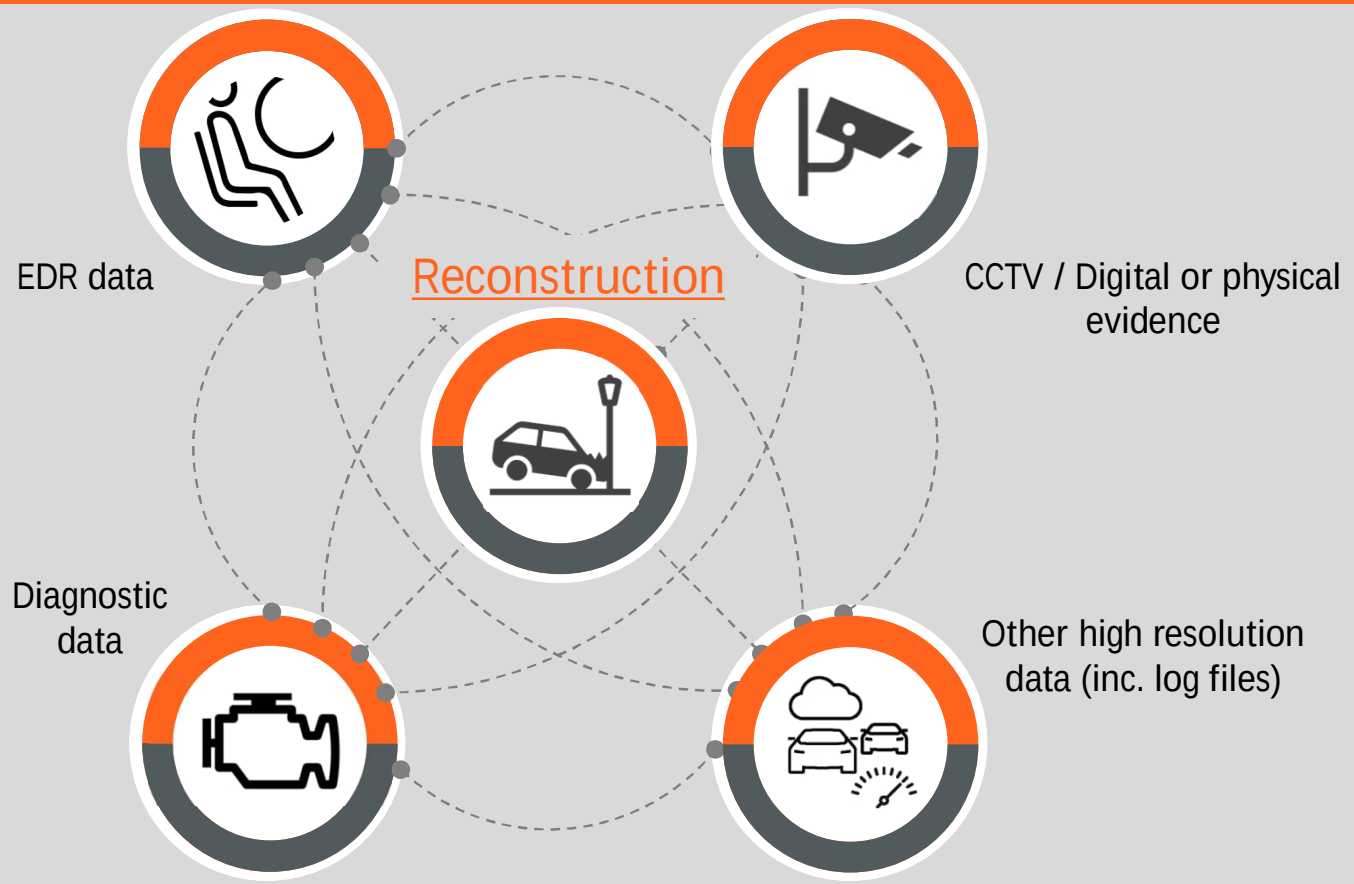
Motorway collision





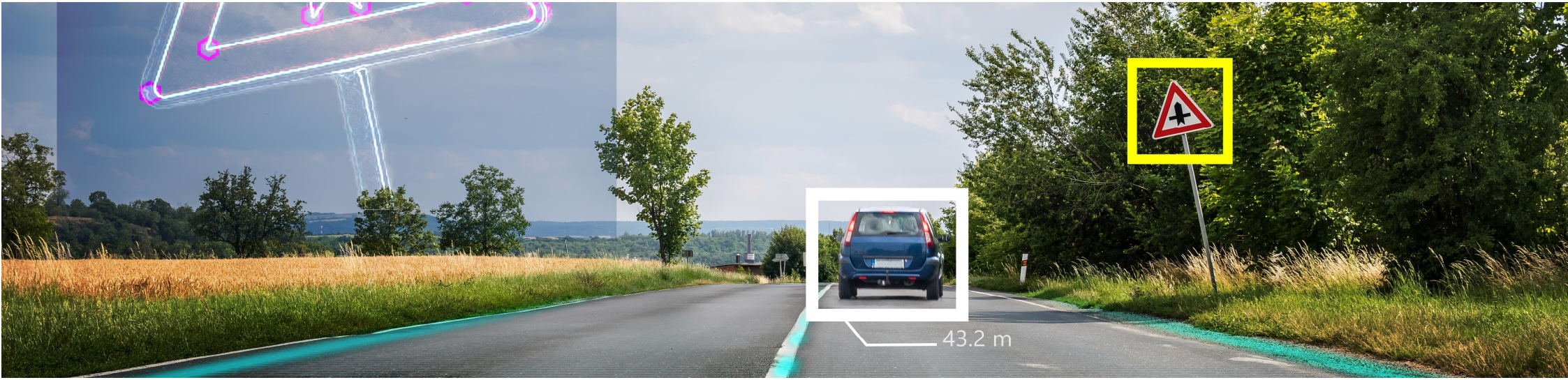
Interconnected data

Cross validation



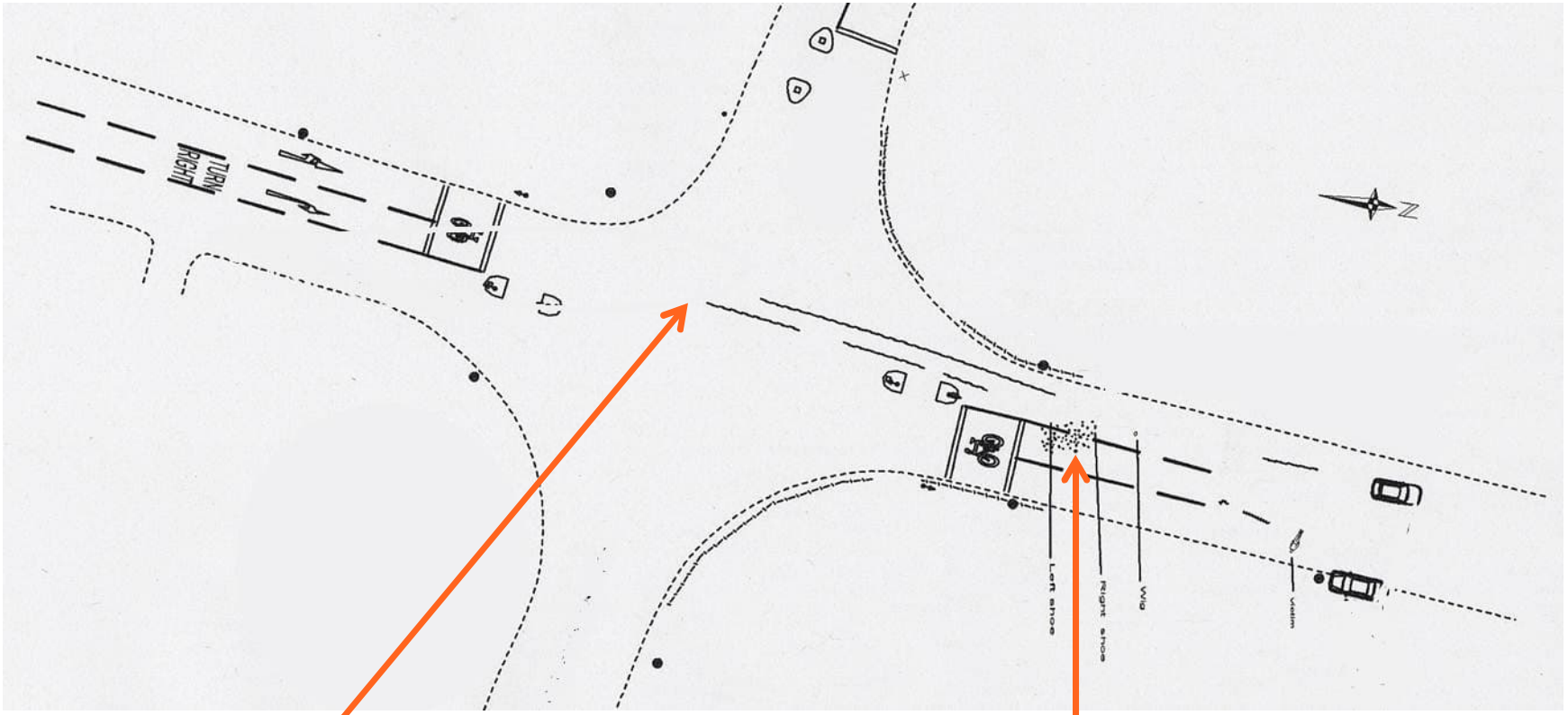
Collision & scene modelling

What could be seen? What could have happened? What if.....



Traditional reconstruction

2D scale plans

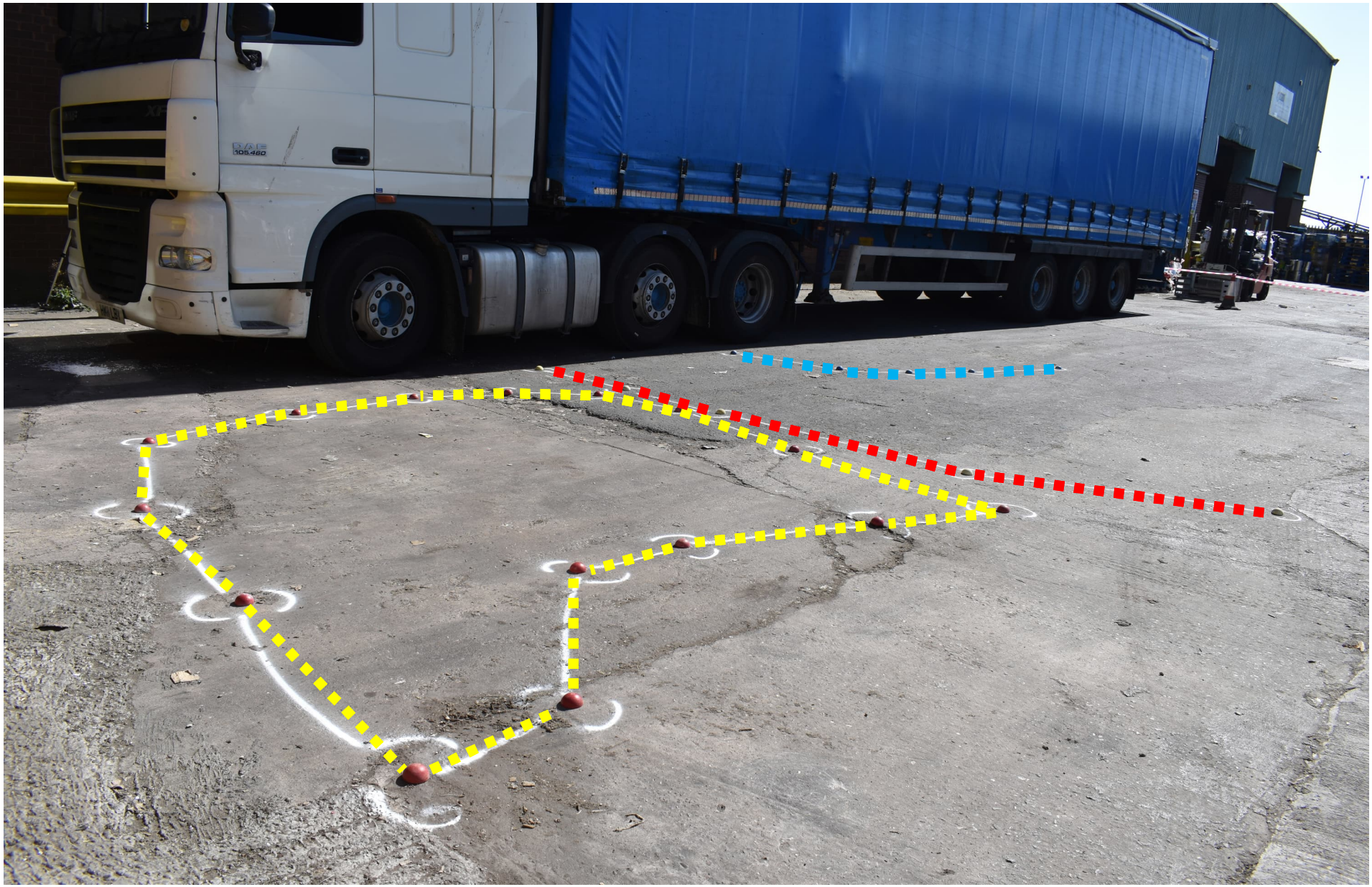


Point of braking (47-50mph)

Area of impact (35-47mph)

More modern reconstructions

3D models

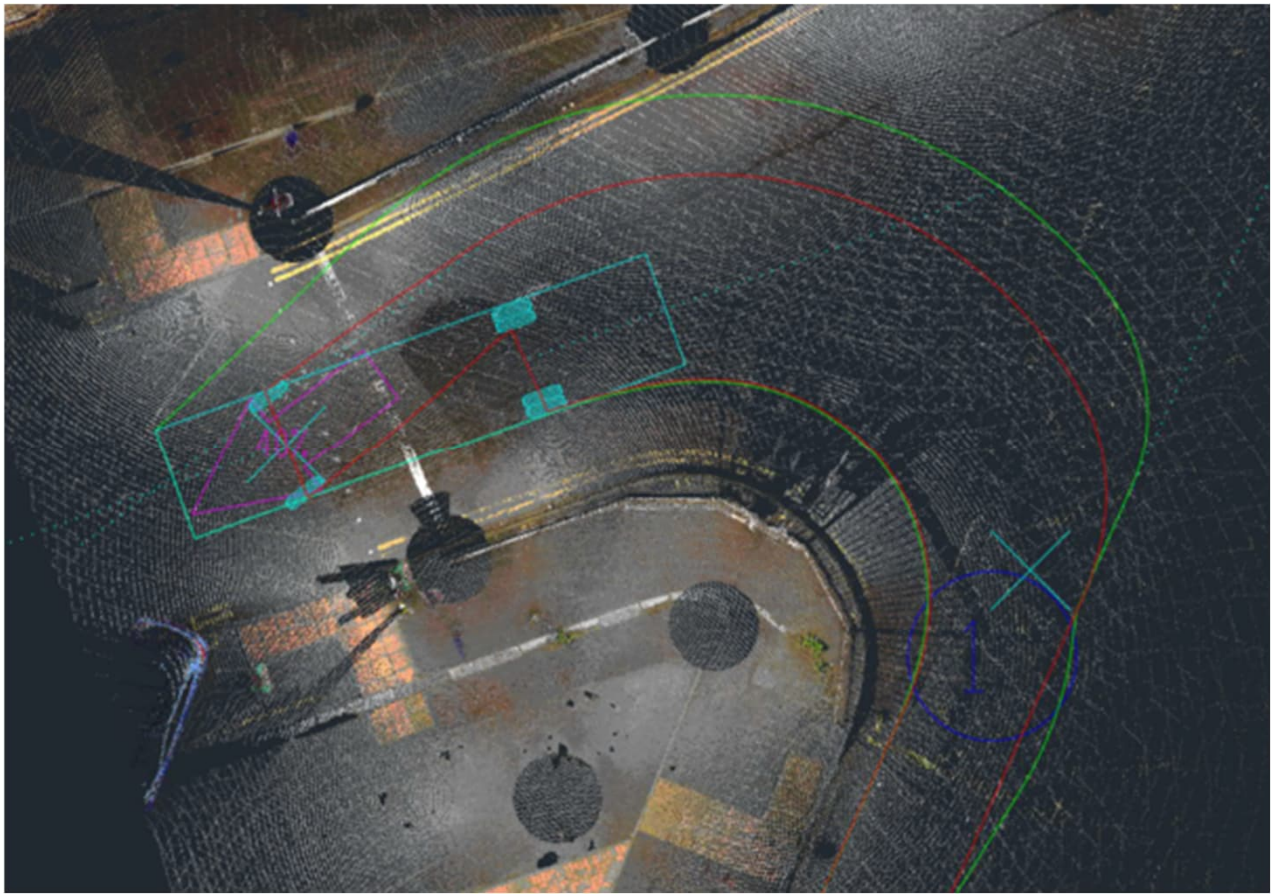

DAF
105.460

Swept path analysis

3D modelling

- Could a vehicle make the turn?
- How much room?
- What did the body obscure?

- View at each stage of the turn
- Cross references to driver vision
- Sightlines

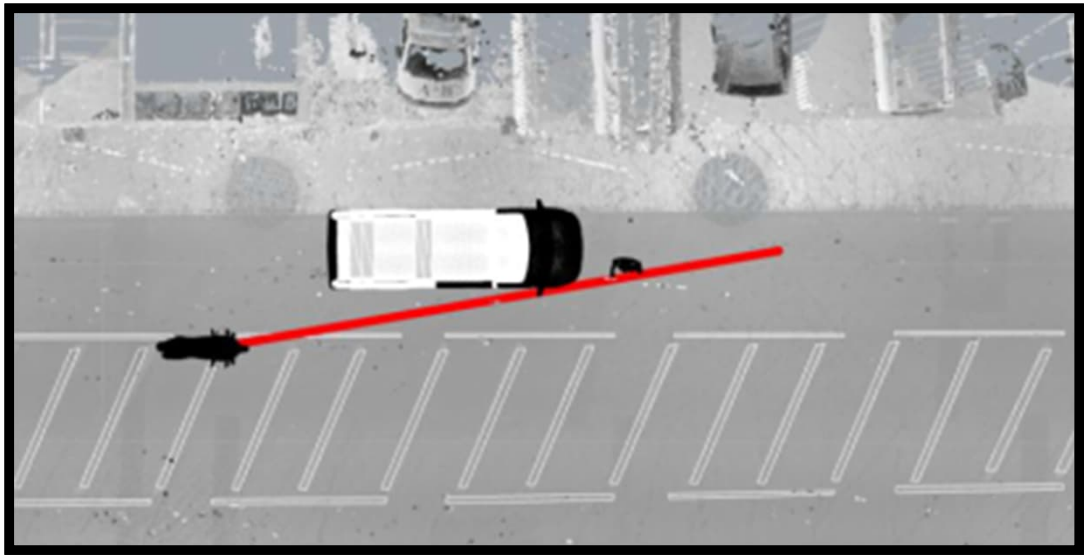


Sight line reconstructions - environmental

3D modelling

Sight line reconstructions - obstructions

3D modelling

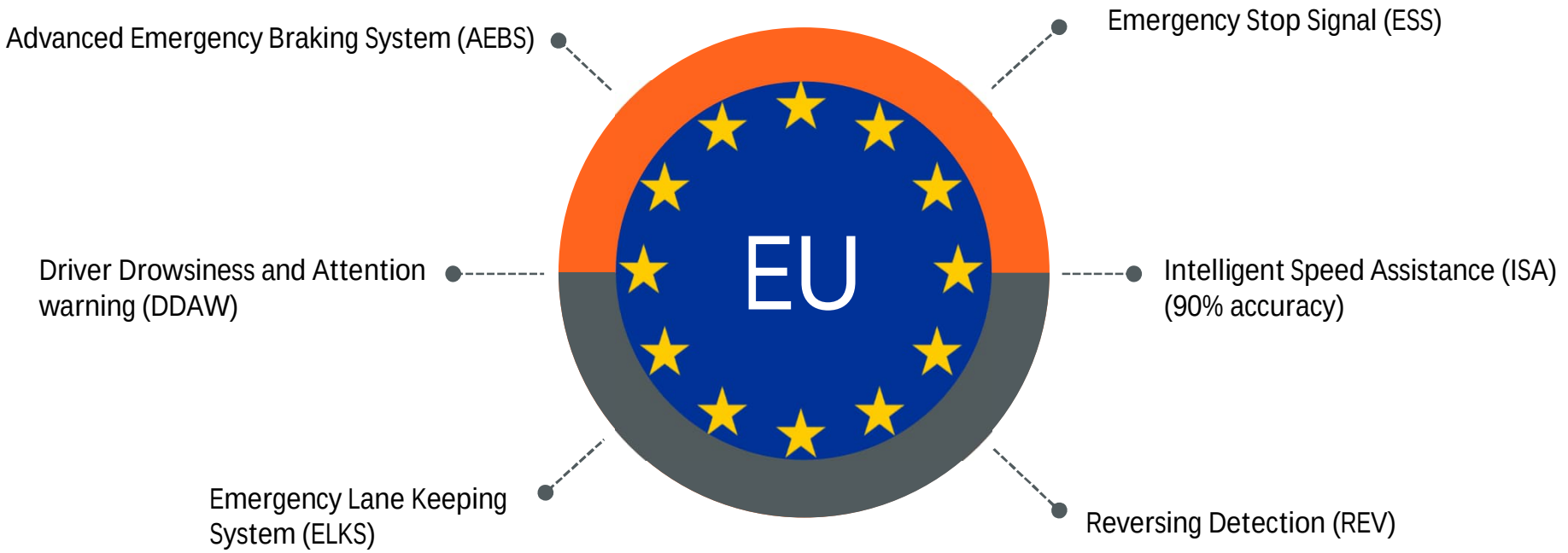


Hypothesis testing

3D modelling

The future of collision data

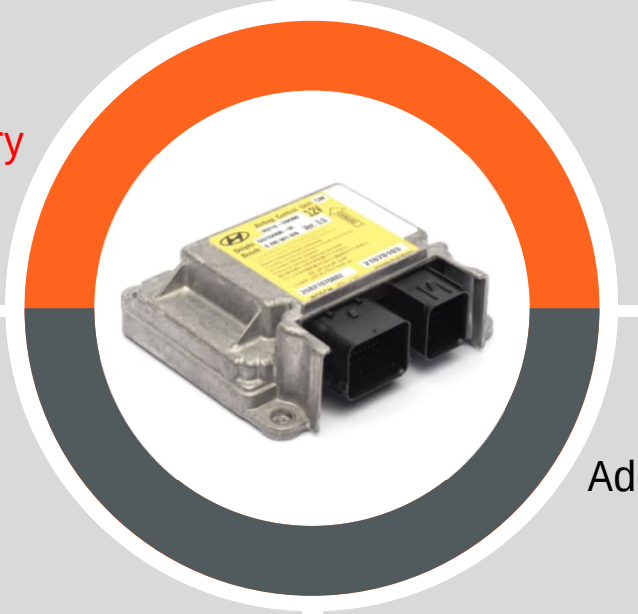
General safety regulations 2



Also..... EDR changes

EU General Safety Regulations (GSR) 2019/2144 & 2022/545

7 July 2024
41 data elements recoverable from every new car.



7 January 2026
EDR for HGV/PCV in scope.

7 July 2024
23 additional data elements (ADAS related) recoverable from new type approvals.

July 2026
Additional data elements (ADAS related) recoverable from every new car.

Future challenges & opportunities

Collision Investigation

- Regulation of Forensic Science & RSIB
- Artificial intelligence, data manipulation & interpretation
- Human factors in CAV operations

AI

AI

Future challenge

How do we know about, use, and interpret vehicle-borne data

Knowledge

Access

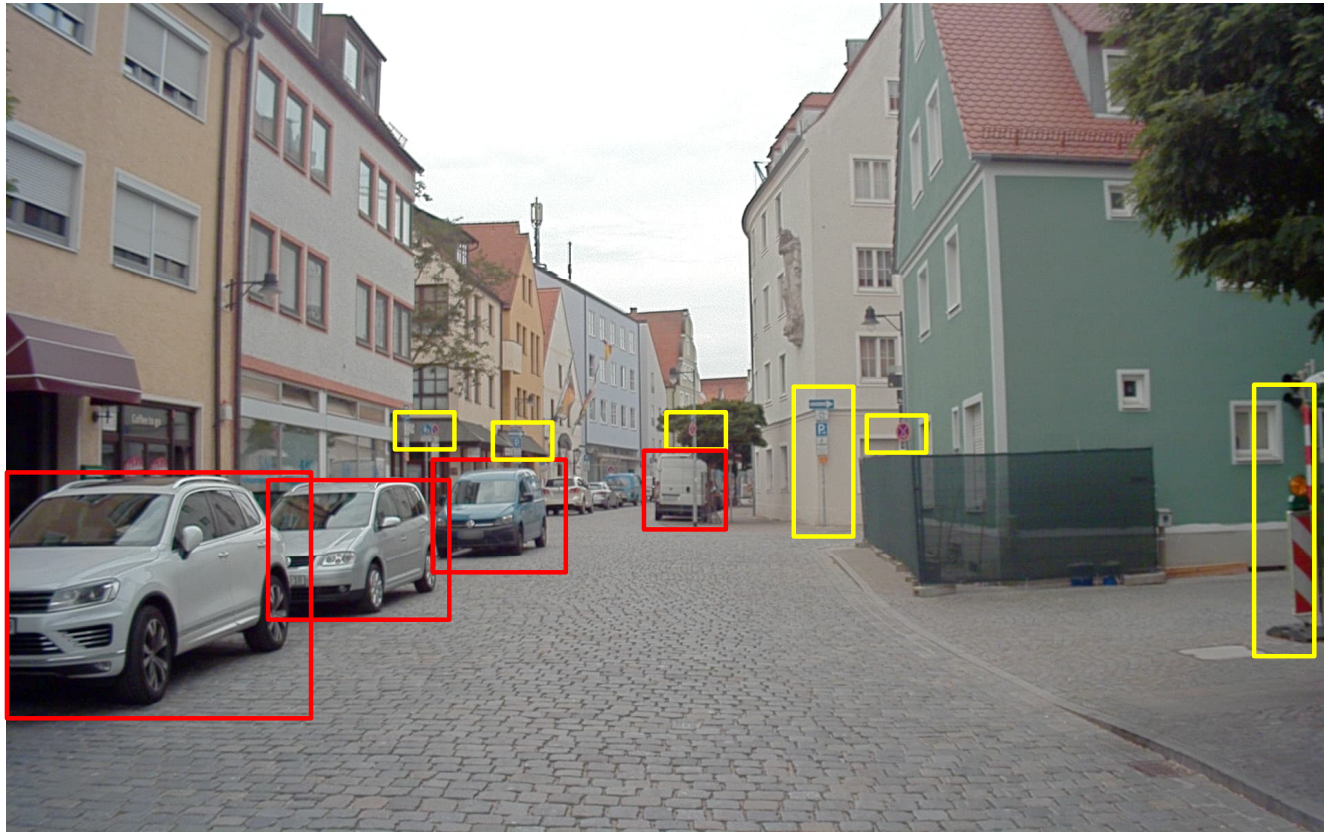
Accuracy & Interpretation

Connected and Autonomous Vehicles

Interpretation of vehicle-borne data

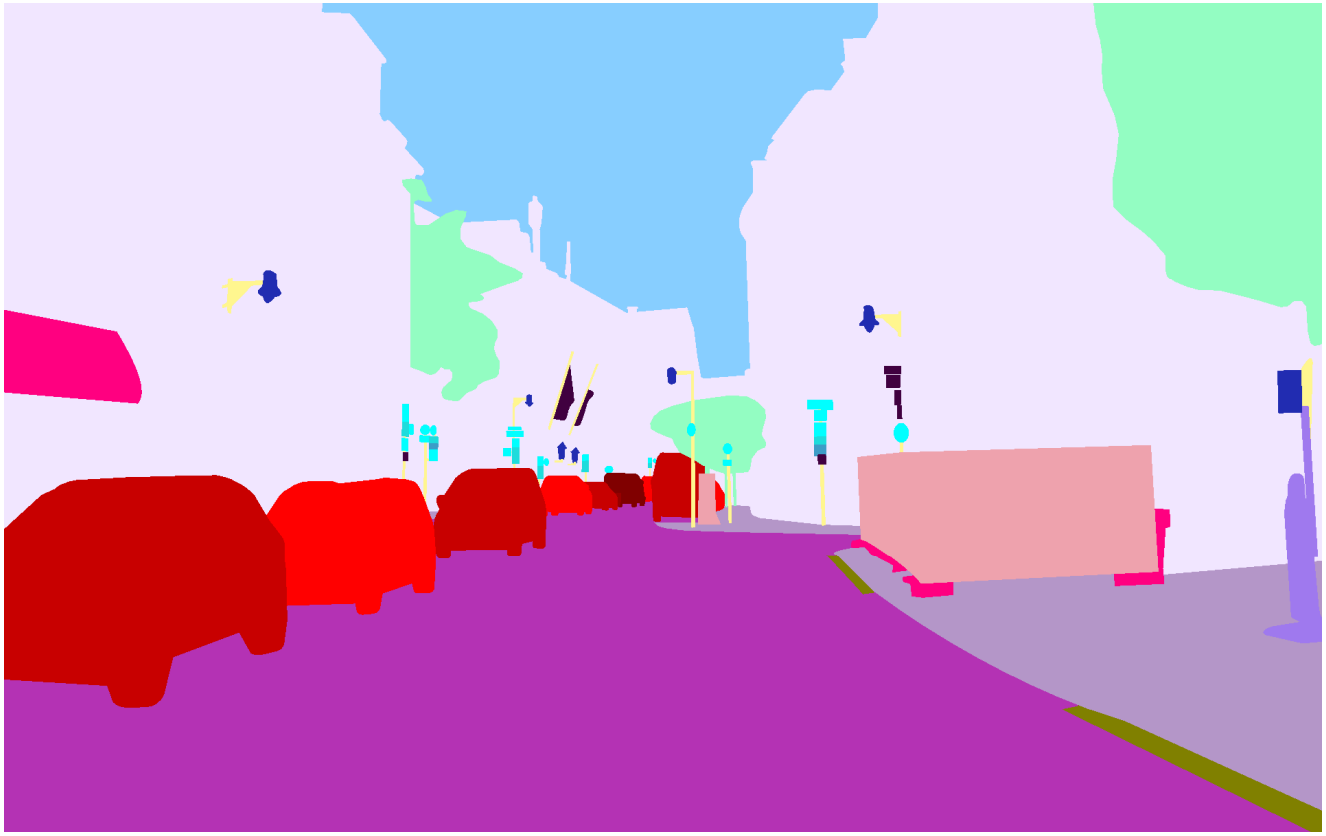
Connected and Autonomous Vehicles

Interpretation of vehicle-borne data



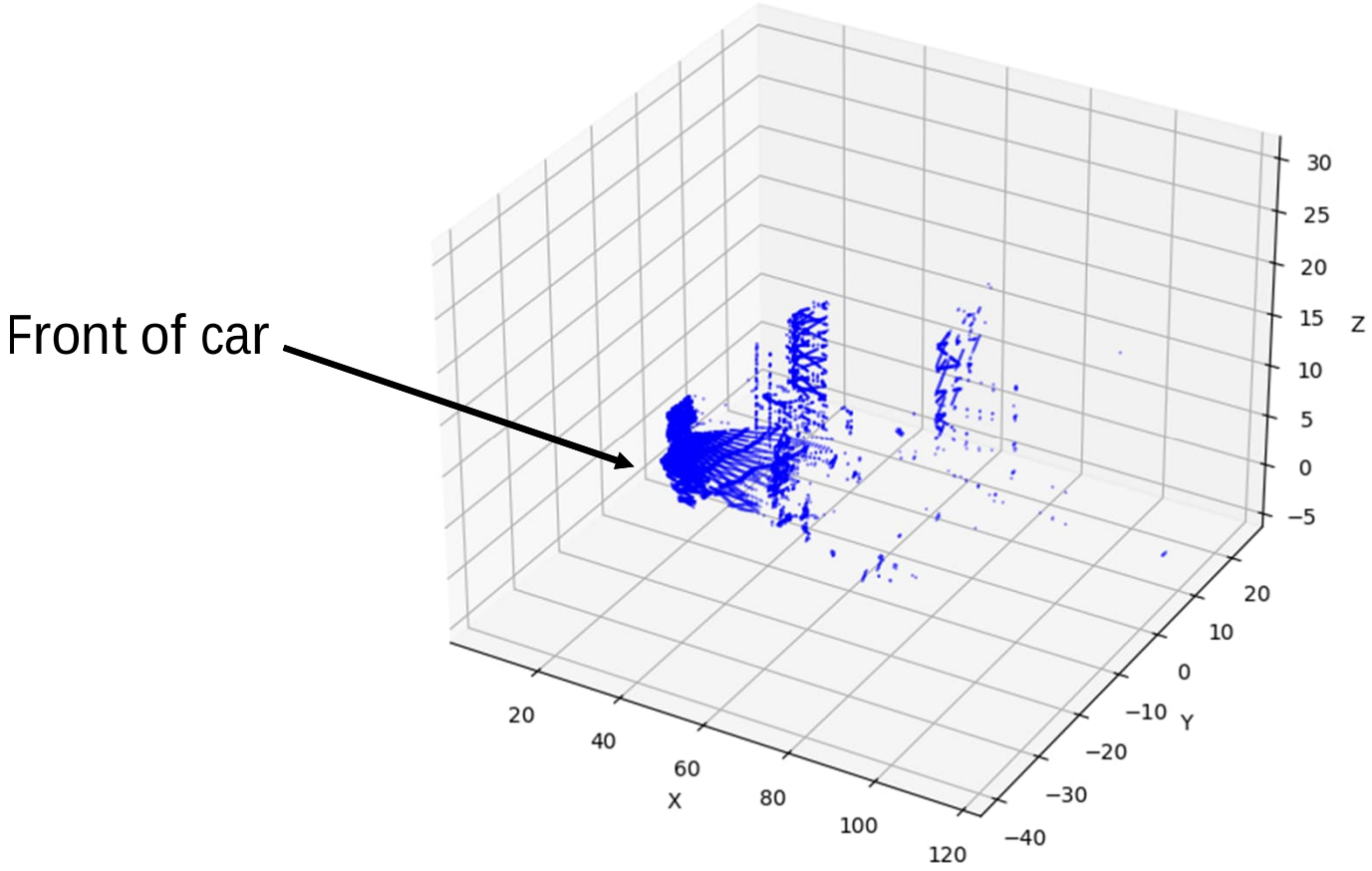
Connected and Autonomous Vehicles

Interpretation of vehicle-borne data



Connected and Autonomous Vehicles

Interpretation of vehicle-borne data



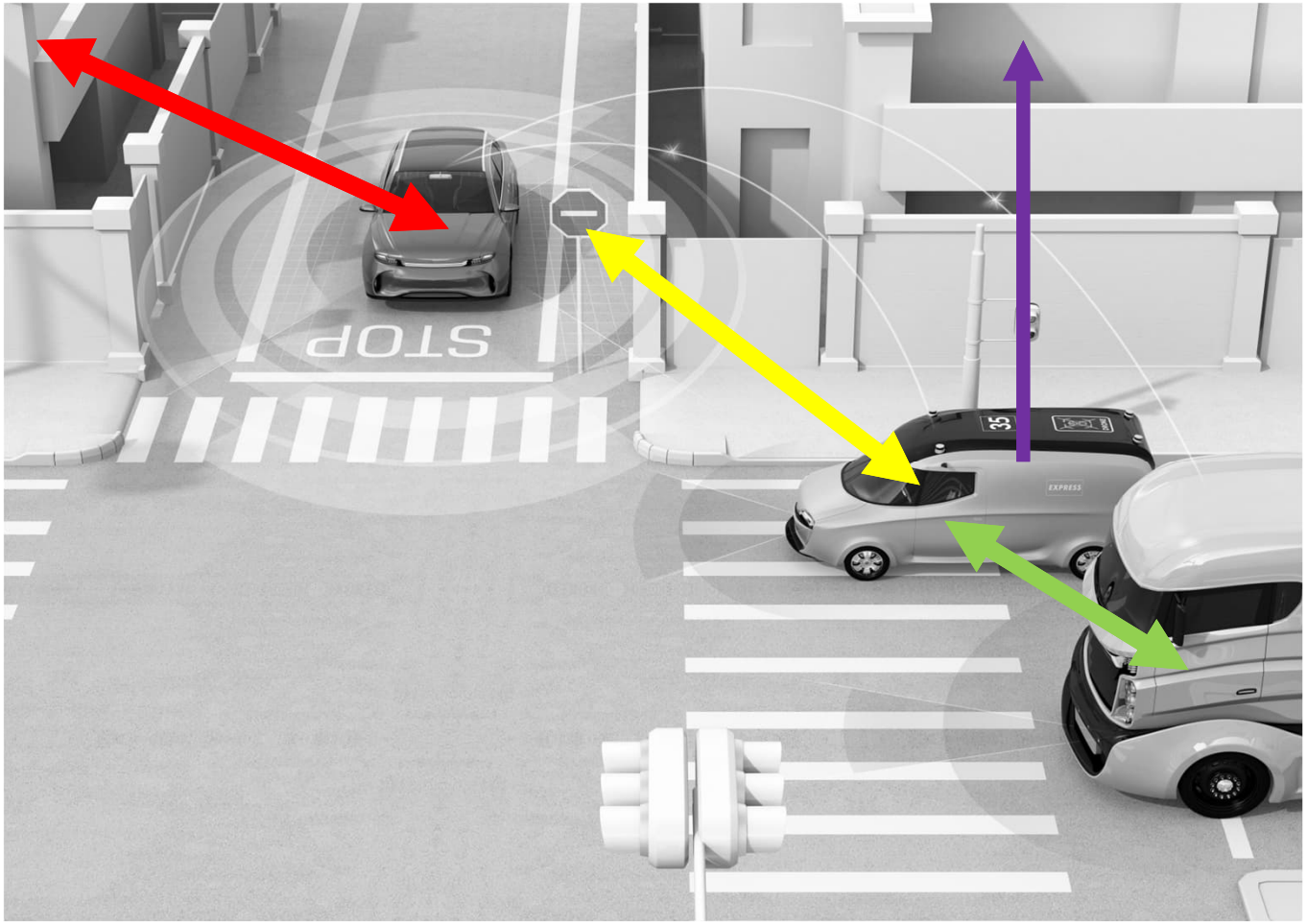
Connected and Autonomous Vehicles

Why is this important?

Connected architecture

Vehicle to...

V2V – Vehicle to vehicle
V2I – Vehicle to infrastructure
V2X – Vehicle to everything
V2N – Vehicle to network



Connected architecture

The future

B2V – Brain-to-vehicle – being developed by Nissan
V2G – Vehicle to grid – electric charging
Platooning – combining multiple vehicles

V2N Real-time applications:

- Digital models
- Digital shadows
- Digital twins

Autonomous vehicles – HGV Platooning

Thank you for listening. Any questions?

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Berkshire | RG40 3GA | United Kingdom