

PAS 1882:2021

Data collection and management for automated vehicle trials for the purpose of incident investigation – Specification



Centre for Connected
& Autonomous Vehicles

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Contents

Foreword	ii
0 Introduction	iv
1 Scope	1
2 Normative references	2
3 Terms, definitions and abbreviations	3
4 Data sources	6
5 Data interfaces, security and third-party access to data	20
6 Information management	22
Annexes	
Annex A (informative) Recommendations for additional information...	24
Annex B (informative) Background context to incident investigation ...	30
Annex C (informative) Control and information diagram	31
Bibliography	33
List of figures	
Figure 1 – Example CAV trial IMP control and feedback model	8
Figure 2 – Data recording during trials	11
Figure 3 – Diagram indicating the acceleration axis coordinates	15
Figure A.1 – Illustrative examples of A.8d) through A.8f) inclusive	26
Figure C.1 – Physical items (plants)	31
Figure C.2 – Controlling entities	31
Figure C.3 – Controls and control actions	32
Figure C.4 – Information sources	32
Figure C.5 – Information flow	32

Foreword

This PAS was sponsored by the UK's Centre for Connected and Autonomous Vehicles (CCAV). Its development was facilitated by BSI Standards Limited and it was published under licence from The British Standards Institution. It came into effect on 31 March 2021.

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Relationship with other publications

PAS 1882 has been developed as part of a wider programme sponsored by CCAV in conjunction with the Department for Transport (DfT), the Department for Business, Energy and Industrial Strategy (BEIS), Innovate UK and Zenzic. This PAS is intended for use by organizations conducting automated vehicle trials. It is informative for other stakeholders including emergency services, insurers, legal service providers, and road/highways authorities. This PAS is intended to be read in conjunction with:

- PAS 1881, PAS 1883, PAS 1885, PAS 11281, BS 10754-1, the Code of Practice: Automated Vehicle Trialling (2019) and the Collision Deformation Classification Code SAE MAR80 J224 CDC; and
- current legislation which applies to the testing of automated vehicles on UK roads.

Information about this document

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Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Use of this document

It has been assumed in the preparation of this PAS that the execution of its provisions shall be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this PAS are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Contractual and legal considerations

This Publicly Available Specification does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a Publicly Available Specification cannot confer immunity from legal obligations.

In particular, attention is drawn to the following specific regulations:

- The Road Traffic Regulation Act 1984 [1]
- The Police and Criminal Evidence Act 1984 [2]
- The Criminal Justice (Scotland) Act 2016 [3]
- The Road Vehicles (Construction and Use) Regulations 1996 [4]
- The Road Traffic Act 1988 [5]
- The General Data Protection Regulation (EU) 2016/679 as it forms part of the law of England and Wales, Scotland and Northern Ireland by virtue of section 3 of the European Union (Withdrawal) Act 2018 [6]
- The Data Protection Act 2018 [7]
- The Automated and Electric Vehicles Act 2018 [8]
- The Privacy and Electronic Communications Directive [9]
- Health and Safety at Work, etc. Act 1974 [10]
- Control of Substances Hazardous to Health Regulations 2002 (COSHH) [11]
- The Workplace (Health, Safety and Welfare) Regulations 1992 [12]
- The Management of Health and Safety at Work Regulations 1999 [13]
- The Provision and Use of Work Equipment Regulations 1998 (PUWER) [14]
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) [15]
- Corporate Manslaughter and Corporate Homicide Act 2007 [16]

0 Introduction

0.1 Background

Incident investigations are an integral part of safety management for safety-critical technologies. While the approach to incident investigation in aviation, rail and marine is systems-focused, the approach to incident investigation on UK roads has, to date, focused on the driver and vehicle.¹⁾ The rapid advancements in technology and the advent of automated vehicles introduce an opportunity for a more systems-based approach to the investigation of incidents on UK roads.

The development of automated vehicle technologies and automated vehicle trials has the potential to overhaul incident investigation through the provision of an additional and reliable information source. The vast quantities of information collected by automated vehicles could significantly assist with criminal and civil investigations, but, vitally, automated vehicles can also provide a valuable source of information for fact-finding safety investigations.

Incident investigations are based on information collected about the incident. The technological advances in automated vehicles mean that there is an unprecedented pool of information available to support the adoption of a systems-based approach to incident investigation in automated vehicle trials.

The information requirements for incident investigation set out in this PAS have been developed specifically for automated vehicles being trialled on publicly accessible sites (i.e. all land where the public has access).

0.2 Structure of the PAS

This PAS is separated into two sections:

- Normative requirements (Clause 4 to Clause 6)
Clause 4 to Clause 6 set out the requirements for the information that a Trialling Organization (TO) needs to collect or explicitly justify not collecting in a trial's information management plan. The requirements are deemed essential to the safe operation of the automated driving system; this includes information the system or TO might receive, generate or hold but is not used for the direct operation of the vehicle.
- Informative Annex A

Annex A sets out recommendations for additional information that for a TO to aim to collect, where reasonably practicable. The aim of the annex is to encourage a move towards best practice. The informative annex lists recommendations based on the current framework for incident investigation on UK roads. The TO can choose whether or not to collect the information identified in this annex.

The UK government remains committed to supporting TOs and the trialling of automated vehicles, and it is recognized that the cost of collection of data should not place an excessive burden on TOs. Separating the core requirements from the additional recommendations recognizes that not all TOs would be able to meet the full set of requirements. The two-layer structure of the PAS is meant to encourage TOs towards best practice without placing on them requirements that would be too burdensome.

The PAS also takes into account that at this time there is no independent accident investigation branch for highways.

0.3 Context on incident investigation

This PAS is aimed at encouraging best practice.

This PAS operates separately from the existing incident or accident investigation processes which apply where there is an incident or accident on the public roads. Background context on these processes is set out in Annex B.

This PAS sets out information that might be relevant to an incident investigation that seeks to ascertain the cause of the incident. This PAS is not an exhaustive statement of the information that might be relevant to an incident investigation and TO's need to be aware that additional information might be requested. An incident investigation conducted by an authority with statutory power to conduct such investigations is entirely separate to the purpose of this PAS.

¹⁾ C. Jackson and N. Kyle, "RAC Foundation: A Highways Accident Investigation Branch – What Lessons Can Be Learnt from the Rail Industry and the Cullen Inquiry?", April 2018. [17]

1 Scope

This PAS specifies requirements for the collection, curation, storage and sharing of information during automated vehicle trials and advanced trials in the UK in relation to information collected or received by the trial system. This PAS covers all automated and co-operative automated driving vehicle trials on any land with public access.

The requirements relate to data deemed essential to the operation of the automated driving system (ADS). This also includes information the system or Trialling Organization (TO) might receive, generate or hold but which is not used for the direct operation of the vehicle.

In addition to the main requirements, the PAS includes recommendations for additional information for a TO to seek to collect, if possible.

The aim of the PAS is to promote consistency in information collection across TOs wherever practicable and to improve safety across all trials being undertaken in the UK.

This PAS builds on the requirements of PAS 1881, *Assuring the safety of automated vehicle trials and testing – Specification*, which provide the safety case framework for such trials by supporting operational safety assurance through the development of information requirements for incident investigation. This PAS recognizes that developments in automated vehicle technologies and associated information capture have the potential to answer key questions in fact-finding safety investigation, including, for example:

- What were the elements of the system and the system boundary at the time of the event?
- Was the vehicle operating within its operational design domain (ODD)?
- What was the internal state of the vehicle? Were any capabilities failed or degraded?

- What was the state of external sources of information/control? Were any capabilities failed or degraded?
- Was the system subject to active security attack?
- When did the system realize that an event was about to occur? How did it become aware?
- What functions were active at the time of the event?
- What actor was in charge of the vehicle at the time of the event? When did the last handover occur?
- Can the system provide detail about how the crash occurred?
- What were the weather conditions at the time?
- What was the vehicle's road position at the time of the event? What lane was each vehicle in?
- What actions did the vehicle intend to take next?
- What was the road layout at the time?
- Which other road users were nearby and what were those road users doing?
- Did either vehicle try to swerve or slam on their brakes?
- How fast was each vehicle travelling?
- Where did the vehicles travel after the incident?
- Was there debris from either vehicle or damaged property?
- Were there any other persons or vehicles nearby who might be witnesses?

This PAS is intended for use by organizations conducting automated vehicle trials. It is informative for other stakeholders including emergency services, insurers, legal service providers, and road/highways authorities.