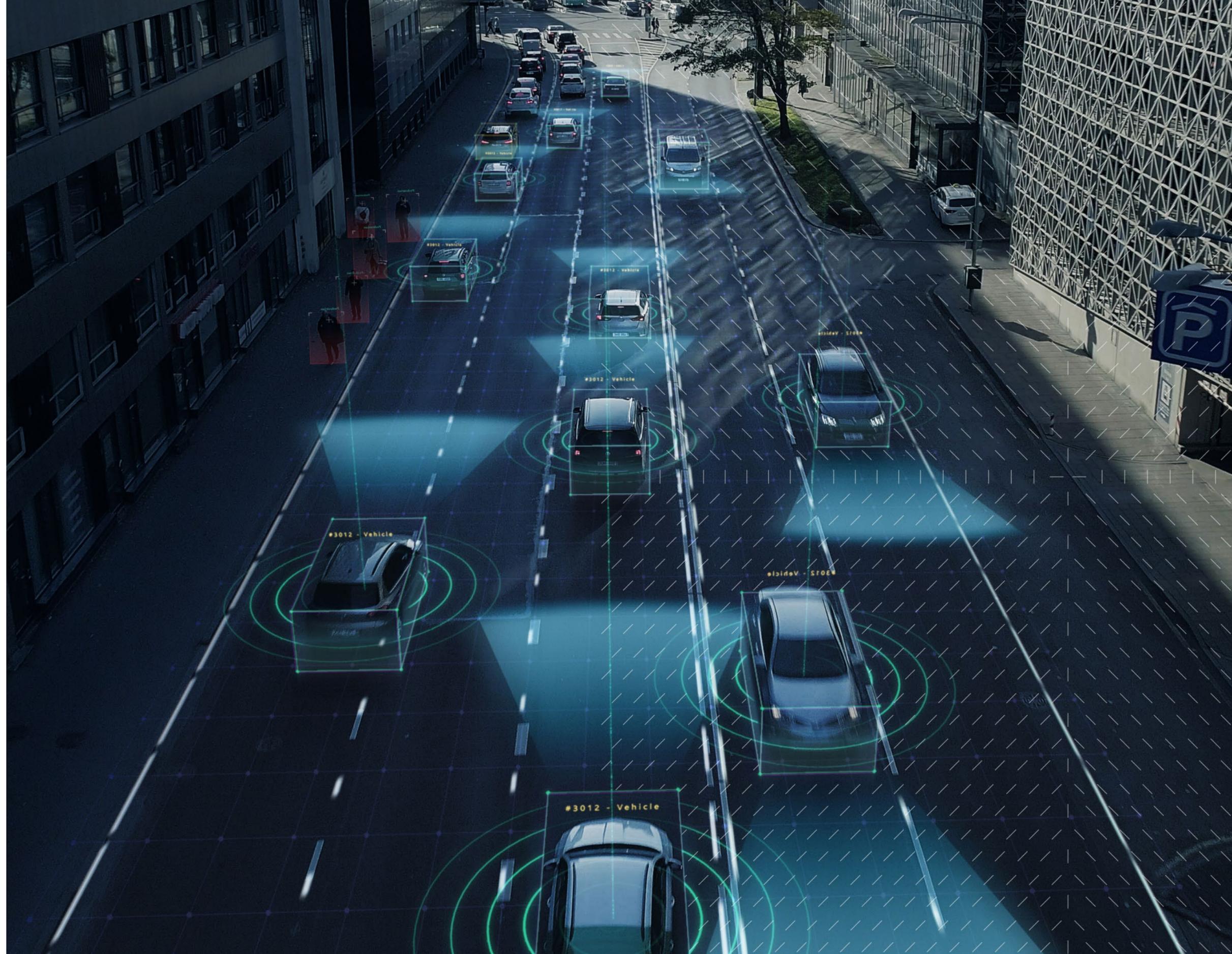


Thatcham
Research
Automotive Risk Intelligence

ABI

Insurer
Requirements for
Automated
Vehicles



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1. GLOSSARY

ABI	Association of British Insurers	NUIC	No-User-in-Charge
ADAS	Advanced Driver Assistance Systems	ODD	Operational Design Domain
ADIG	Automated Driving Insurer Group	OEDR	Object and Event Detection and Response
ASDE	Authorised Self-Driving Entity	OTA	Over-The-Air
AEVA	Automated and Electric Vehicles Act	UNECE	United Nations Economic Commission for Europe
AV	Automated Vehicle	UIC	User-in-Charge
CCAV	Centre for Connected and Autonomous Vehicles	VIN	Vehicle Identification Number
DfT	Department for Transport		
DVLA	Driver and Vehicle Licensing Agency		
ISO	International Standards Organisation		
MIB	Motor Insurer's Bureau		
MRM	Minimum Risk Manoeuvre		

2. CONTEXT

2.1 THE PURPOSE OF THIS DOCUMENT:

This document represents the views of the Automated Driving Insurer Group (ADIG), under the auspices of Thatcham Research and the Association of British Insurers, in identifying the key requirements of the motor insurance industry regarding automated vehicles.

It builds on previous documents (Defining Safe Automated Driving, 2019), and is in direct response to the announcement of the Automated Vehicles Bill 2023¹. Whereas the previous document focused on insurer requirements for Automated Lane Keeping Systems (ALKS), this document is designed to cover automated technology on a broader level, acknowledging that this technology has many ways in which it may manifest on vehicles in the UK. This document will be updated regularly to inform the development of suitable secondary legislation.

As assisted driving systems become common on UK roads with new technological advances such as Ford BlueCruise (hands-off driver monitoring), higher levels of automation appearing on UK roads draws closer. Multiple vehicle manufacturer strategic roadmaps contain deployment of conditional automation in 2025-2026, giving a clear and prudent need for regulation.

The aim of this document is to provide government, regulators, technology developers and vehicle manufacturers principles by which to ensure automated vehicles are safe and insurable. It presents a set of requirements which are necessary for insurers to fulfil their obligations to consumers as defined within the Automated and Electric Vehicles Act 2018. These requirements are essential to ensure that victims rightfully and quickly receive their compensation in the event of a collision involving an automated vehicle.

Previous definitions have been reviewed and consolidated, recognising technical and regulatory progress as well as the broader implications of the Automated Vehicles Bill. The Centre for Connected and Autonomous Vehicles (CCAV) and the Department for Transport (DfT) have strived to ensure that the UK remains a world leader in legislative developments for self-driving vehicles through the Automated Vehicles Bill, supported by the previously released Connected & Automated Mobility 2025 roadmap². If the challenges recognised within this document can be addressed, the benefits and opportunities of automated vehicle technologies can be realised.

UK Motor Insurers have been influential and consistent in defining requirements throughout the automated driving journey to date, actively lobbying and providing technical insight to the UK agencies, much of which has been adopted in UNECE R.157 regulations. Creation of a working group in consultations with government and the Law Commission have enabled definition of requirements which now form many principles of the Automated Vehicles Bill. Insurers have been proactive and supportive in enabling the work of AV-Drive - defining naming systems to reduce consumer confusion and mitigate inappropriate use. Insurers have also been instrumental in enabling automated trials to begin on UK public roads. A continuation of this collaborative approach is crucial to support safe adoption of new technology and meet the additional obligations placed on Motor Insurers by AEVA to deliver consumer protection.

2.2 4 KEY ASKS FROM THE UK MOTOR INSURANCE INDUSTRY:

- 1) **Safety First Principle**
Automated vehicles should follow a safety first principle. Clearly defined capability and operational constraints of the systems to ensure users understand their roles and responsibilities when using and/or owning such a vehicle.
- 2) **Visibility**
Transparency of the authorisation process. Visibility of authorised automated vehicles, authorisation requirements per feature, the level of functionality, and software versions authorised for road use.
- 3) **Data Access**
Access to relevant vehicle data in order to ensure that consumers are protected and that insurers are able to fulfil their obligations to their customers as set out by AEVA 2018. Timely and unhindered access to data is required.
- 4) **Cybersecurity**
Cybersecurity threat is addressed. Vehicle systems and connectivity, either by the vehicle manufacturer or other source, must be robust to detect and mitigate the risk of a cyber induced incident over the life time of the vehicle.

2.3 RESPONSIBILITIES FOR INSURING AUTOMATED VEHICLES

A vehicle is defined as autonomous if it is designed with capability for the vehicle to travel autonomously, either with a user capable of resuming control or no intended user in the vehicle. The self-driving test defines requirements for an autonomous feature to be operated safely and legally on UK roads. An autonomous vehicle is not permitted for use until it has satisfied the self-driving test, at which point specific features are authorised and the vehicle is defined as automated.

There are distinct and fundamental differences between levels of autonomous functionality, which in turn means that the user of the vehicle has different responsibilities based on the level of automation. It is therefore vital that the users of these vehicles have a clear understanding of their legal obligations to ensure their safe use and prevent the risk of misuse and dangerous situations arising.



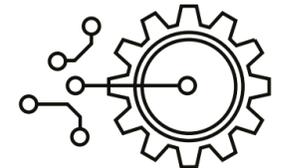
Autonomous

Designed to travel autonomously



Self-Driving Test

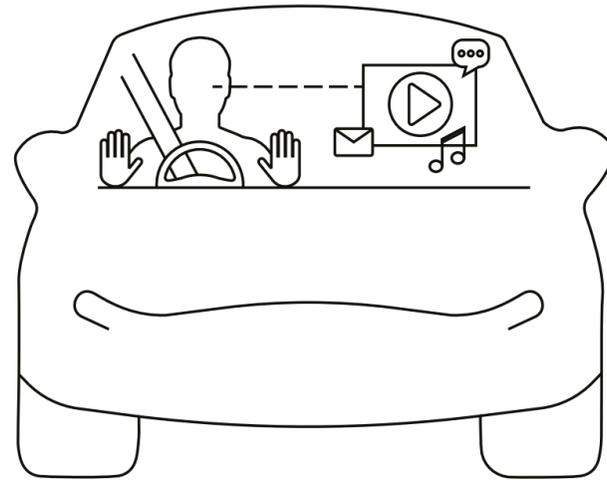
(Contains requirements for **Authorisation**)



Automated

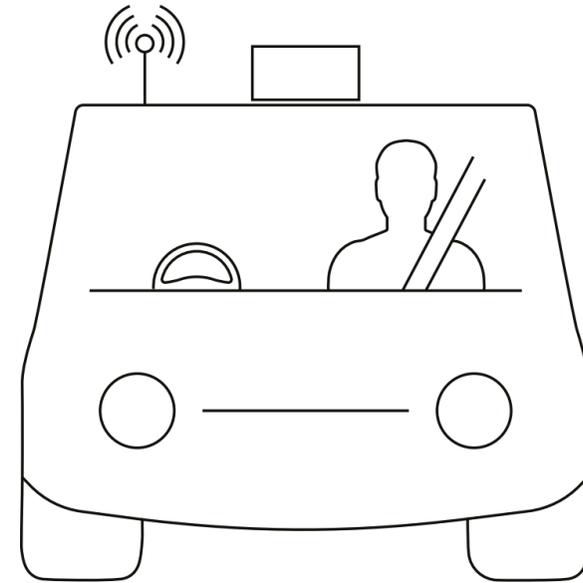
Possesses feature(s) which has passed self-driving test to become **Authorised**





UIC

The user-in-charge is defined as an individual within a vehicle, in a position to exercise control of an authorised vehicle while an automated feature is engaged, but is not controlling it. This would describe the driver acting in a supervisory role while an Automated Lane Keep System is engaged.



NUIC

No-user-in-charge is defined as an automated feature engaged, with no individual in the vehicle exercising control over it. This would describe automated valet parking features or automated cruising where the driver is permitted to perform high level secondary tasks, such as sleeping.



			Self-Driving		
			ADAS Adaptive Cruise Control, Blind spot assist	UIC when active ALKS	NUIC when active Robo-taxi, Auto valet parking
 Object and event detection and response	—	INACTIVE ACTIVE	 	 	 
 Ability to perform non-driving tasks	—	INACTIVE ACTIVE	NO  NO 	NO  YES  *	NO  YES 
 Obligation to insure vehicle	—	INACTIVE ACTIVE	 	 	 
 Responsibility at the time of incident	—	INACTIVE ACTIVE	 	 	 
 Insurer obligation to compensate	—	INACTIVE ACTIVE	 **  **	 **  	 ** 

Key:

-  Feature Inactive
-  Feature Active
-  Driver
-  Vehicle
-  User-in-charge
-  Owner or no-user-in-charge operator
-  Authorised Self-Driving Entity
-  Insurer of vehicle
- * YES - user must be ready to respond to transition demand, secondary tasks limited
- ** If driver negligent, driver's insurer

3. KEY CHALLENGES WITH AUTOMATED VEHICLES

3.1 CLARITY OF RESPONSIBILITIES AND LIABILITIES FACED BY MOTOR INSURERS:

Depending on the functionality of the automated vehicle, the user will have different responsibilities placed upon them.

Specifically, when the driver becomes the user-in-charge:

- Motor insurers will become liable for accidents caused by an automated vehicle whilst it is operating in an automated mode, as defined by the Automated and Electric Vehicles Act (AEVA 2018). According to the definition set out in AEVA and the AV Bill, when the automated system is activated, the user-in-charge will be a third party to vehicle control. Therefore, in the event that the automated vehicle causes an accident, the user-in-charge will be entitled to compensation for third party injury. This potentially introduces an additional claimant in each such case whose claim will be made against the vehicle's own insurer.

- The driver (or user-in-charge) will only be entitled to make such a claim against the vehicle's own insurer when the vehicle is operating under an automated mode, therefore identifying whether the vehicle or the human was driving at the time of incident is critical. This can only be achieved by ensuring that the insurer has immediate access to sufficient data and information from the vehicle. Data will also be required for incidents in proximity to ensure the vehicle does not cause a collision without being directly involved. The level of data required may differ between automated capabilities and revision of feature.

Proposal: Collision data must be immediately available on a neutral and equitable basis to the insurer to establish who was driving and what decisions were made in an automated vehicle incident.

3.2 IDENTIFICATION OF SELF-DRIVING CAPABILITY:

The AV Bill sets out the framework for approval and authorisation of automated vehicles, whereby the feature or features of the vehicle must be identified as either "user-in-charge" or "no-user-in-charge" operation. It is crucial for both drivers and insurers to have clarity over the difference between these functions.

Details of the functional capabilities of an authorised automated vehicle must be freely available to the insurance industry. This includes:

- a fully defined operational design domain (ODD)
- make, model and specification of the authorised vehicle(s) to VIN level
- visibility of the approval requirements & tests passed by the authorised vehicle(s)
- access to the results of any investigation by the in-use regulator

Proposal: A dynamic record of vehicles authorised (and de-authorised) to be automated that can identify functionality down to VIN level, linked to the DVLA vehicle registration database.

3.3 CYBERSECURITY RISK

The role of the MIB was not reflected in AEVA. There is no provision in the law for uninsured AVs, including if they are involved in cyber attacks or acts of terrorism.

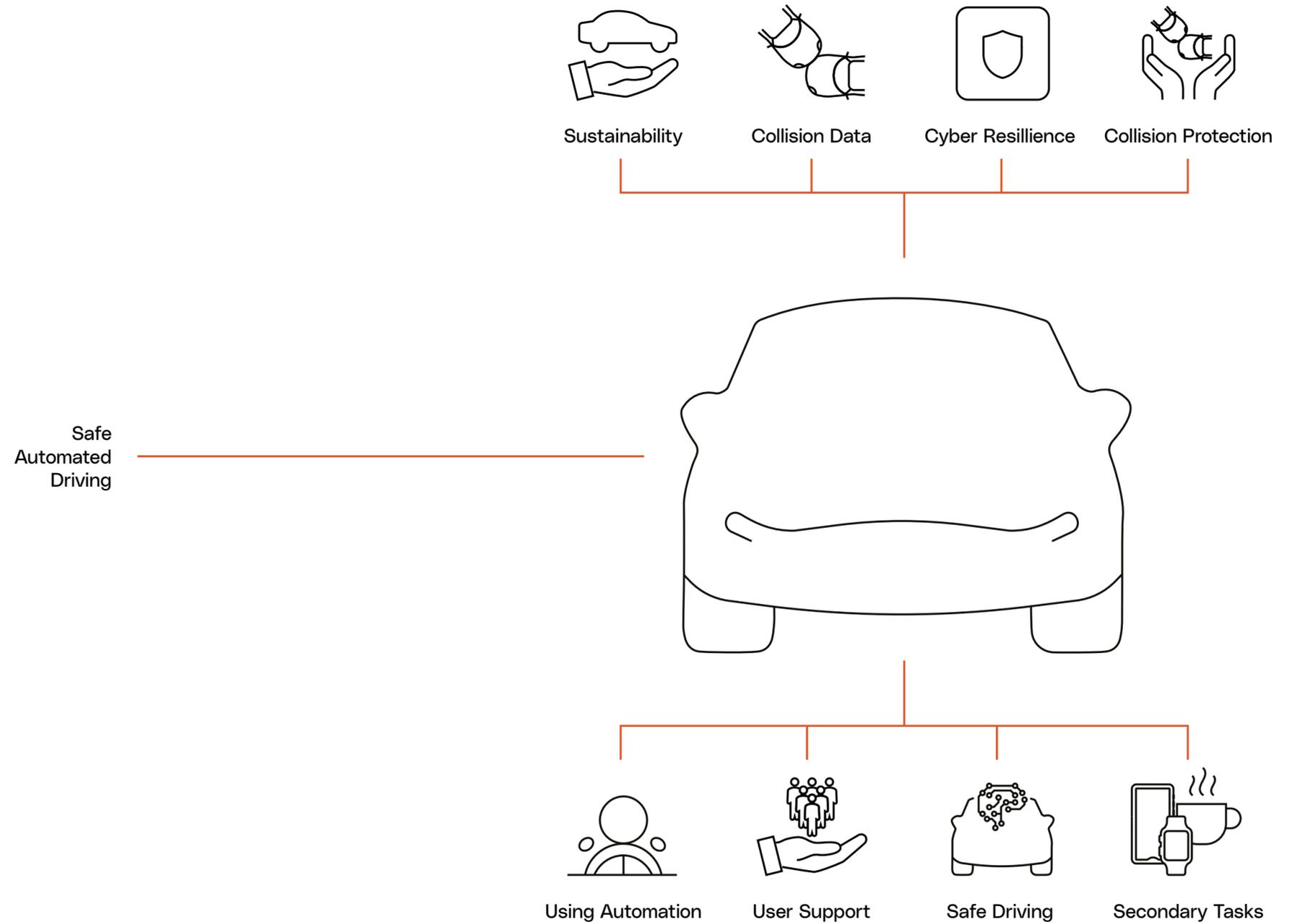
Currently, the MIB is working closely with the DfT and CCAV to understand the risks of cyber attacks on self-driving and highly connected vehicles. Cyber attacks on these types of vehicles present a step change in terms of risk, not least because of the theoretical possibility of multiple vehicles being hacked simultaneously. Considering terror attacks, for example, the potential impact of an event where several vehicles are involved could exceed similar attacks involving a conventional vehicle, where typically only one vehicle has been used.

Reinsurers may also treat cyber attacks as individual incidents, rather than a cumulative event which could trigger reinsurance thresholds, further compounding the risk to solvency for an individual insurer.

Proposal: Provide clarity on the role & obligations of the MIB in respect of Automated vehicles.

4. 8 REQUIREMENTS FOR SAFE AUTOMATED DRIVING

This section outlines the updated requirements for the safe deployment of automated vehicles, considering the Automated Vehicles Bill, and recognising that different types of self-driving technology will need to be addressed specifically with secondary legislation.



4.1 INFORMATION, NAMING & USER OBLIGATIONS

It is the responsibility of the Authorised Self-Driving Entity to eliminate consumer confusion. System naming, information in marketing and user manuals must be appropriate and accurate. Self-driving will be differentiated from assisted driving systems by clearly defined user interfaces. The ASDE must ensure and validate that drivers understand the system functionality and their roles and obligations. The system must be inherently simple and intuitive to understand and the need for training minimised. This must be supported with clear and detailed information, at the dynamic VIN level, for insurers and regulators to identify the functionality of specific vehicles.

4.2 SAFE DRIVING: AUTOMATED VEHICLE CAPABILITIES & BEHAVIOUR

The automated vehicle must be reliably capable of all standard driving tasks within the defined ODD in which the system can be used. The automated vehicle must obey road traffic laws and interact predictably with other vehicles and vulnerable road users. Secondary legislation should determine the capabilities of specific automated functionality to ensure effective performance throughout the ODD. This level performance to be stipulated is defined as National Safety Principles, with a continuous improvement process working towards realisation of an eventual improved Safety Ambition (Connected & Automated Mobility 2025 roadmap). A clear set of requirements are needed to set this minimum performance level for operation, quantifying the improvement over current incident rate required. System safety goals must be defined for each automated feature and verified as per ISO 26262 Automotive Functional Safety Standard.

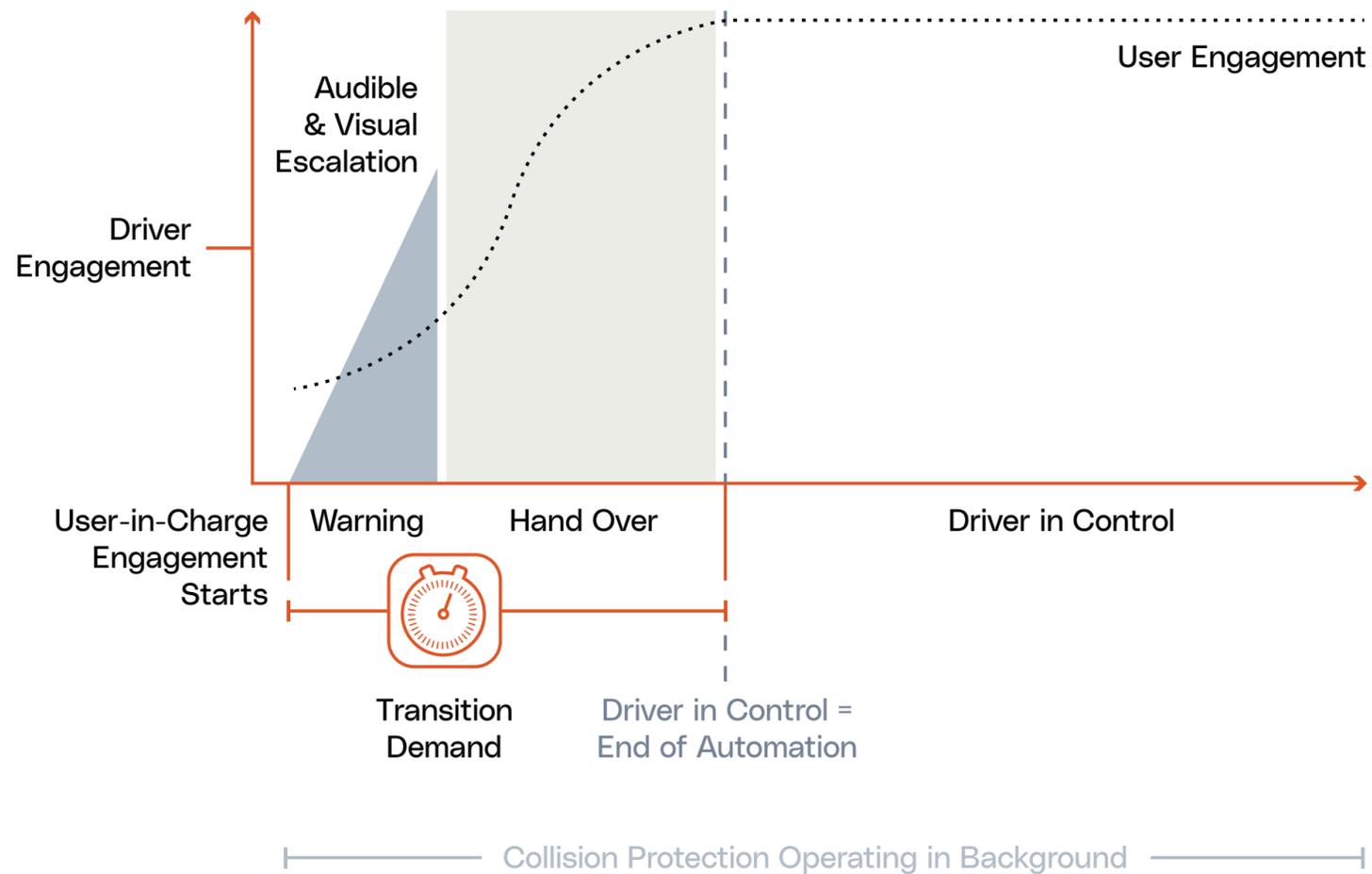
4.3 TRANSITIONING IN/OUT OF AUTOMATED MODE

Automated driving shall only be possible when the ODD preconditions are met. If it is possible for the user to activate and deactivate the self-driving capability, it must be absolutely clear to the user that they are engaging self-driving capability, or reverting to manual driving mode. For a user-in-charge journey, the system must monitor the user attentiveness state during operation to ensure attentiveness in the event of a transition demand. For a no-user-in-charge journey, the vehicle must be wholly capable of the driving task within the ODD, but the no-user-in-charge operator or owner remains responsible for the safe operation of the vehicle.

In the event of a system failure during a user-in-charge journey, the automated vehicle must initiate a transition demand, giving the user an appropriate amount of time to re-engage with the driving task without compromising the approved system safety principles. In the event that the user-in-charge is unable to or does not respond to the transition demand, the system must maintain the capability to perform a minimum risk manoeuvre and find safe harbour.

In the event of a system failure during a no-user-in-charge journey, the automated vehicle must maintain the capability to perform a minimum risk manoeuvre and find safe harbour, without causing due harm to the user(s) or other road users.

Unplanned Handover Responsive Driver



4.4 NON-DRIVING RELATED TASKS

It must be absolutely clear to the user-in-charge the type of secondary tasks they may undertake whilst the automated feature is active. The nature of the secondary tasks should be constrained to the ODD, and every effort should be made by the authorised self-driving entity to prevent misuse or inappropriate tasks being performed by the user-in-charge.

For a user-in-charge journey, secondary tasks must be limited to those available through the vehicle infotainment system to ensure that the user be re-engaged with the driving task at short notice. Sleeping and mobile phone use shall not be permitted for these journeys.

For a no-user-in-charge journey, secondary tasks which greatly diminish the user's ability to respond to a transition demand may be permitted, but their suitability must be evidenced by the authorised self-driving entity and verified by the approval authority.

4.5 COLLISION AVOIDANCE

In the event that the automated vehicle finds itself in a critical safety situation outside of the ODD or as it transitions out of the ODD, the vehicle must be equipped with emergency collision avoidance technology that can react as appropriately as possible to the situation. It is acknowledged that responding fully to all foreseeable circumstances outside of the ODD is not achievable, but this should not limit the vehicle to responding in a safe and appropriate manner as best as feasibly possible. For example, emergency collision avoidance systems should not be disabled automatically outside of the ODD.

4.6 CYBER RESILIENCE

The authorised automated vehicle must be designed, developed, and maintained to minimise the vulnerabilities and the consequences of cyber intrusion. The vehicle itself, and any over-the-air updates, must minimise cyber security risks in both technologies and organisations, requiring certified compliance with ISO 21434 Automotive Cyber Security standard.

It shall be the responsibility of the authorised self-driving entity to inform government, in use-regulators and insurance organisations of any discovered cyber threat or insecurities. This means that an additional, dynamic and thorough layer of continual assessment is required to ensure that the authorised self-driving entity satisfies the requirements of the authorisation and ensures that best practice is met.

4.7 INFORMATION & DATA

Vehicle manufacturers must produce a sufficient, readable data set which is accessible to insurers that will confirm whether the automated vehicle or the human driver was in control in the event of a collision, in order for the insurer to fulfil their obligations as set out in AEVA 2018. This data must be accessible by the in-use regulators, appropriate investigative authorities, and the relevant vehicle insurer as soon as possible upon a collision being detected, to ensure swift compensation to any victims. Access to data must also be granted where an Automated Vehicle may have indirect involvement in a collision.

The data recording must be triggered in all collisions and emergency system intervention situations. The recording must contain data from a minimum of 30 seconds prior to collision, and 15 seconds after the collision. To enable insurers to deal with late notification, claims data should be retained and accessible an appropriate amount of time post recorded incident, ensuring alignment with the limitation period for bodily injury.

4.8 LIFETIME FUNCTIONALITY

The authorised self-driving entity should be responsible for ensuring that the functional performance of the automated vehicle is maintained over the lifetime of the authorisation. In-use monitoring, data, investigation and legislation must continually develop over time to ensure any degradation of self-driving capability is identified and resolved immediately. Over-the-air updates will allow for functional improvement over time. Any updates, modifications or new features should be notified to the authorisation authority and the motor insurance industry.

Recalls required to maintain the safety principles, including software updates, must be registered in the DVLA database and automated functionality suspended until the recall is resolved. Manufacturers are also required to submit any communications to owners, dealers, and others about any software updates that address a defect, whether safety related or not.

All autonomous features must implement clear standardised diagnostics monitoring health of system components. Systems shall be capable of self-calibration and must notify the driver when performance is degraded due to calibration in progress or calibration out of specification. When these faults occur, clear standard tell tales as per ISO 2575 must be displayed to inform the driver. Availability of repair methods, requirements and prerequisites must be criteria for approval.



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