Developing the Automated Vehicles Regulatory Framework – response from The Chartered Institution of Highways & Transportation (CIHT)

1. Introduction

1.1 The Chartered Institution of Highways and Transportation (CIHT) is a charity, learned society and membership body, with over 10,000 members across 12 UK regions and several international groups. CIHT represents and qualifies professionals who plan, design, build, manage, maintain and operate transport and infrastructure.

1.2 This is a general response to the questions asked in the Developing the Automated Vehicles Regulatory Framework consultation. This response is written based on expert member input from people working in the highways and transport sector, with knowledge of roads infrastructure.

1.3 CIHT believes that the regulatory framework for Automated Vehicles (AVs) should begin by considering the consequences of taking no action, before examining vehicle class (e.g., freight) and vehicle type (e.g., size). This approach allows policymakers to understand the potential unintended consequences of a laissez-faire adoption of AVs.

1.4 CIHT believes that the deployment of automated vehicles must complement, not dilute, the sustainable transport hierarchy as reflected in the updated Highway Code. While the Call for Evidence does not reference the hierarchy directly, it is essential that future secondary legislation and regulatory guidance situate Automated Vehicles (AVs) within a place-based modal framework that prioritises walking, wheeling, cycling and high-quality public transport. AV technology should be introduced in a way that enhances - rather than competes with - sustainable mobility choices, supports modal shift, and reinforces wider government objectives on decarbonisation, accessible streets, health, and inclusive travel.

1.5 AV schemes should be assessed against their contribution to the sustainable transport hierarchy:

1.5.1 AV deployments must not undermine active travel through increased traffic volume, kerbside pressure, or reduced public realm quality.

1.5.2 AV passenger and goods services should be designed to strengthen public transport networks, including first mile/last mile connections, rather than generate car-based convenience trips that displace bus patronage.

1.5.3 No-User-in-Charge (NUIC) and Users-in-charge (UIC)[1] operations must be planned within local place-based frameworks so AV routing, kerbside management and stopping behaviour do not erode the conditions needed for walking, cycling and bus priority.

1.5.4 Any authorisation, licensing or in use regulatory processes should explicitly consider impacts on sustainable mode share, aligning AV policy with the government's net zero and health outcomes.

1.5.5 By embedding the sustainable transport hierarchy into the implementation of the Automated Vehicles Act 2024, government can ensure that AV technologies accelerate, rather than delay, the transition to low carbon, equitable and people centred transport systems.

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[1] A UIC feature relies on an individual being in the vehicle and being able to exercise control over it, as it may require that an individual takes over control in certain circumstances. Whilst a NUIC feature is active, these vehicles may only carry passengers or have no humans on board at all.

1.6 AV integration must also not undermine the principles of 15-minute cities or 20-minute neighbourhoods – if AV travel makes longer journeys easier or cheaper, it risks encouraging trip lengthening and reducing local living, which runs counter to sustainable planning and place-based policy objectives.

1.7 AV freight operations could expand significantly from major distribution centres, as lower operating costs from removing drivers may undermine efforts to shift freight onto the rail network.

1.8 AVs present an opportunity to transform mobility and road safety. However, their deployment must be safe, equitable, and integrated with wider transport policy objectives.

1.9 Introducing AVs onto UK roads offers potential positive benefits, but to maximise the benefits the risks need to be proportionately regulated for a wide range of risks and practical challenges. AVs can promote mobility benefits for rural areas and disabled users, avoiding concentration of AV benefits among wealthier and urban demographics. This should include people unable to drive for other reasons (not just those who are disabled but also medical reasons for example following traumatic brain injury; stroke or cardiac events, or neurological conditions such as epilepsy). It is important to make sure the transition is as smooth as possible, inclusive and leaves no one behind.

1.10 AV policy needs to be objective, rather than technology-led, guided by appropriate and proportionate levels of regulation and must be taken forward within the context of a wider multi-modal, integrated transport strategy aligned with economic, social and environmental goals.

1.11 CIHT supports the use of AVs on UK roads within Vision Zero and Safe System principles and see the need for AVs to be introduced carefully and monitored as their use develops. At some point the use of AVs could be widespread, but before that happens the following issues detailed below need to be addressed.

2. Issues to be addressed in the roll out of AVs

2.1 Local authorities and transport authorities' powers over AV use
  2.1.1 AV taxis and shared fleets will require overnight storage, maintenance and charging facilities. Unlike human-operated taxis, AVs cannot rely on distributed on-street residential parking, although markets for renting out private driveways may open up which may mitigate this problem. AVs parking in public car parks overnight could provide a revenue stream for local authorities (however this would need to consider the impact on the night-time economy which sometimes relies on free parking at night). Local authorities will need clear guidance on planning policy, land allocation and transport impacts associated with AV depots. Without this, large concentrations of idle AVs could create new congestion hotspots and local environmental impacts.

2.2 Infrastructure Readiness:
  2.2.1 Automated vehicles (AVs) must be integrated into existing street environments without compromising established design principles that prioritise pedestrian and cyclist safety. The Automated Vehicles Act (2024) requires vehicles to adapt to current road conditions, rather than prompting redesigns that could disadvantage vulnerable users. It is essential that AV deployment does not lead to measures such as increased guard railing or restricted pedestrian access, which would

undermine the street user hierarchy and recent progress in accessibility and public realm. AVs introduction into the sustainable transport hierarchy should enhance, not detract from, inclusive and sustainable mobility.

2.2.2　There is a need to consider the state of infrastructure readiness and adaptation at different levels of AV adoption. This is an area of research, exploring questions such as: "Are current roads ready for highly automated driving?"[2]. The emerging regulatory ecosystem at a European level - Infrastructure Support Levels for Automated Driving (ISAD)[3] - would be worth considering when developing this area further in the UK.

2.2.3　In the short-term, roads and streets will continue to assume human-driven vehicles (physical signs, markings, traffic lights etc.) when they are designed. In the longer-term, as AV adoption rises significantly, traffic control devices can be increasingly digitised (this has major implications for road design, capacity management and operations). Regulatory Digitalisation (i.e. Digital TROs) are just as important as "physical" digitalisation such as digital mapping.

2.2.4　The deployment of AVs has significant implications for local government capacity, funding and skills. Highway authorities will require sustained investment to manage digital mapping, data assurance, cybersecurity, road-space monitoring, and asset upgrades. The regulatory framework should therefore be accompanied by a clear funding mechanism and national support programme to ensure local authorities are not burdened with unfunded responsibilities and consistency across authorities is essential to avoid cross-boundary barriers. There should be a requirement for AVs to report back to a central mapping repository on the mapping data they have collected so that the central mapping repository is kept up-to-date.

2.2.5　AV adoption should be able to handle road infrastructure as it is, i.e. in a worn and imperfect state, rather than rely on perfect markings and surfaces (which public agencies will struggle to afford given existing resources), or indeed require them as local highway authorities are able to change street layouts as they see fit.

2.2.6　There is a need to address the complexity on both permanent and temporary form and controls between vehicles using database intelligence versus real-time 'reading' of on-road features. This includes:

- reading physical speed limit signs which are at odds with a database (which may be out of date). There is the common problem of cameras reading signs, for side road entries AV's might mistakenly think they relate to mainline limits. Humans may realise sign size indicated terminal signs versus repeater but an AV may not[4][5];

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[2] Science Direct (2024) Are current roads ready for highly automated driving? A conceptual model for road readiness for AVs applied to the UK city of Leeds

[3] *INFRAMIX Infrastructure Categorization*. Available at: https://www.inframix.eu/infrastructure-categorization/ (accessed 23 February 2026).

[4] Farrell, S., 2023. Tesla's Full Self Driving Isn't The Only Technology With Speed Sign Detection Problems. Forbes, 27 Feb. Reports that machine vision can misinterpret irrelevant signs (e.g., maximum speed markers on trucks) as regulatory speed limits — a type of context-related error that humans avoid via visual context.

[5] Sitawarin, C., Bhagoji, A.N., Mosenia, A., Chiang, M. and Mittal, P., 2018. DARTS: Deceiving Autonomous Cars with Toxic Signs. arXiv:1802.06430. Demonstrated how manipulated signs can deliberately cause AV perception systems to misclassify traffic signs in both virtual and real-world settings, illustrating vulnerabilities in sign recognition.

- reduced speed limits e.g. when there are roadworks and part-time 20mph e.g. '20mph when light show' near schools
- variable speed limits and lane control (e.g. red-X lane closure; line divert arrows etc) on motorways and all-purpose roads;
- temporary route alteration for example diversions of lanes at tie-ins of maintenance works and new link implementation.
- part time permanent restrictions such as school streets which are closed to all motor vehicles twice each weekday

2.2.7 Some of the benefits of AVs only emerge at higher levels of market penetration. The roadmap for adoption of automated vehicles should account for this.

2.3 Operational Consistency

2.3.1 All vehicle models by all manufacturers should operate in consistent, intuitively understandable ways in their operating environment, to avoid confusion for other road users in the same space. AVs operating at L4 and above should have the ability for their operations to be monitored (or at least an option to be) by relevant authorities for multiple purposes.

2.4 Safety and data sharing by operators with regulators:

2.4.1 The safety case for AVs must account for system-level impacts. Even if individual AVs are safer, unregulated proliferation - particularly of zero-occupancy vehicles - could increase traffic volumes, worsen congestion, and negatively affect safety, noise and public realm quality. The framework should include mechanisms to manage induced traffic.

2.4.2 Public acceptance depends on perceived as well as actual safety. AVs remove familiar human cues such as eye contact or gestures, which may make pedestrians and cyclists feel less secure. Developers should assess impacts on perceived safety across genders, ages and abilities, and design AV behaviour to minimise intimidation. AV behaviour could evolve dependent on conditions, even without OTA (over the air) updates; as such, there will need to be clarity over how the software can be validated as safe and certified and what machine learning is "allowed" within that certification.

2.4.3 Evaluating the introduction of AVs should involve continuously assuring the safety of them. Adopting approaches such as Digital Commentary Driving to monitor AV safety performance on every mile driven is one approach for this. This is a technique that involves the continuous collection of data from an AV on its perceptions, decisions, reactions and feedback whilst driving. This adopts a standardised format for AV data collection to enable analysis of AV safety performance in a manner analogous to "commentary driving" (a technique used to train and assess human drivers in which they verbalise relevant information in the driving scene).[6].

2.4.4 AVs must be seen to be, and be, safe – this is important for both public perception and acceptance.

2.4.5 AVs should be better than a 'Competent Driver' (a human driving without ADAS and higher levels of automation): AVs must demonstrate a significant reduction in fatalities and serious injuries, not just parity with human drivers.

2.4.6 Hierarchy of Protection: AV behaviour must prioritise vulnerable road users (pedestrians, cyclists, micromobility and moped and motorcycle users) in line with the Highway Code.

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[6] https://www.bsigroup.com/en-GB/insights-and-media/media-centre/press-releases/2021/june/digital-commentary-driving-the-new-safety-technique-that-can-help-put-automated-vehicles-on-our-roads/

2.5 Equity and accessibility

    2.5.1   AV deployment for taxi services and private hire should explicitly support wider social objectives, including reducing isolation in rural and peri-urban communities. AVs should operate as first- and last-mile connectors to public transport hubs, complementing existing services. Transport authorities who license AVs which are used as taxis may need to pay for them to support wider policy objectives in a similar way buses are contracted to run as subsidised services. Alternatively, operators could be required to demonstrate how services will reinforce public transport networks and deliver measurable social value before they are awarded a taxi licence.

    2.5.2   For ride-hailing AVs, the framework must consider personal security. Users may feel vulnerable if they cannot verify the destination, alter the route, or request to exit promptly. Clear standards are needed for in-journey interaction, voice command capability, journey confirmation and emergency exit protocols, including design considerations informed by the safety needs of women and other groups disproportionately affected by harassment. CIHT recommend that careful consideration is given before AVs are used to transport children (especially those with special educational needs) and vulnerable adults.

    2.5.3   Platforms for booking ride-hailing services using AVs must address accessibility of the booking system (for people with visual or neurological conditions, and for older users who find technology less accessible) as well as the vehicle itself.

2.6 Shared AVs

    2.6.1   AV deployment should be integrated with Mobility as a Service (MaaS) to reduce vehicle numbers and improve efficiency. There is a strong case that AV technology should only be applied to public and shared mobility models.

2.7 Public Trust and Ethics

    2.7.1   Ensure transparency in AV decision-making algorithms and safety data. This includes establishing clear ethical frameworks for crash scenarios and prioritisation. It requires translating abstract principles (like "do no harm") into specific, executable algorithms that determine how a vehicle balances risks to passengers, pedestrians, and property during unavoidable accidents.

    2.7.2   Address cybersecurity risks and resilience of digital networks

2.8 Liability

    2.8.1   CIHT considers that liability in the event of an automated vehicle incident must remain clear, transparent and fair, with responsibilities assigned to the parties best placed to manage and mitigate risk.

    2.8.2   To support public confidence, the regulatory framework should ensure that:

        2.8.2.1   Manufacturers and Automated Driving System (ADS) developers are accountable for failures linked to system design, software updates, sensor performance, or integration issues.

        2.8.2.2   Authorised Self Driving Entities (ASDEs)[7] remain responsible for ensuring the vehicle continues to satisfy the self-driving test throughout its operational life, including safe behaviour, compliance with authorisation requirements, and proper software management.

        2.8.2.3   Users-in-charge (UICs) are not held liable for the manner of driving while the automated feature is engaged, except in clearly defined scenarios such as acting outside the authorised Operational Design Domain (ODD) or failing to respond to a transition demand.

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[7] An Authorised Self-Driving Entity (ASDE) is a legal actor designated for each AV that has been granted authorisation to operate autonomously. The ASDE is responsible for ensuring that the vehicle meets relevant safety and regulatory requirements throughout its operational life.

2.8.2.4 NUIC Operators bear responsibility for the safe oversight of no-user-in-charge journeys and should be liable where operator-side failures - such as inadequate monitoring or remote assistance - contribute to an incident.

2.8.3 Clear allocation of responsibility across these actors ensures that liability sits with the entity that controls the relevant risk. This approach supports fairness for road users, reinforces safety by design, and maintains a strong incentive for continuous improvement in automated driving systems.

3. Recommendations for government and industry

3.1 CIHT have the following recommendations for government and industry:

3.1.1 AV technology has significant potential in freight, public transport, trams, service vehicles and maintenance operations. Government should support trials and business models in these sectors where automation may provide greater public benefit, safety improvements and operational efficiency. Electronic platooning trials for HGVs found that at 'most' junctions they did not work safely and/or effectively[8]. Humans merging with a 'train' did not realise the train could be broken and waited for it to pass, becoming stationary in the merge slip and making a standing start into high-speed traffic.

3.1.2 Given the small number of AV technology suppliers globally, local authorities may face limited competitive options when procuring AV services. Government should develop national procurement guidance and explore shared procurement frameworks to help authorities secure fair, transparent and future-proof contracts.

3.1.3 AV deployment should explicitly support wider social objectives, including reducing isolation in rural and peri-urban communities. AVs should operate as first- and last-mile connectors to public transport hubs, complementing existing services. Operators should be required to demonstrate how services will reinforce public transport networks and deliver measurable social value.

3.1.4 CIHT recommend that research be carried out to assess the on-road behaviour of AVs for the following features, and other relevant conditions such as:

3.1.4.1 Carriageway narrowing, where two vehicles cannot pass simultaneously - there is at present limited evidence as to whether AVs will simply take priority where signed, versus the human drivers' tendency to assessing other vehicles' position and progress to infer the driver's likely behaviour (theory of mind)[9].

3.1.4.2 Roads at night in wet weather when road markings are more difficult to see.

3.1.4.3 When markings are superseded and both markings are visible following the alteration.

3.1.5 Develop standards for connected infrastructure (e.g., sensors, V2X (Vehicle-to-Everything)) to complement AV systems.

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[8] TRL (2022) HelmUK – HGV platooning trials: final report. TRL. Available at: https://www.trl.co.uk/publications/helmuk---hgv-platooning-trials--final-report (Accessed: 4 March 2026).

[9] Theory of mind is our ability to recognize that other people have thoughts, feelings, and perspectives that may be different from our own. It's a key social skill that usually develops in early childhood, helping us predict behavior, show empathy, and navigate relationships. https://www.simplypsychology.org/theory-of-mind.html

3.1.6 Transport licencing authorities should mandate consideration of the inclusivity of automated vehicle-based transport services (e.g., support for wheelchair accessibility, sensory impaired users, neurodiverse users etc.) so that physical assistance in/ out of the vehicle or a responsible adult is provided where needed.

3.1.7 There is a need for greater clarity on the roadmap (and duration) for a smooth transition from now to almost 100% AV capable road operations that aligns technology, regulation and social acceptance, and ensures appropriate dialogue between regulators and private sector.

3.1.8 A high safety bar must be set in that the safety performance of AVs is in line with Vision Zero and supports the Road Safety Strategy for the UK Government. As such there should be mandatory safety reporting that would include the need for publishing transparent AV safety data.

3.1.9 Develop national standards: For AV behaviour, interoperability, and accessibility.

3.1.10 Plan for equity: Ensure AV benefits reach rural and disadvantaged communities and users with mobility, visual or neurological conditions affecting access to transport.

3.1.11 There is a need for public education around AVs as this is critical to counter misleading marketing and media hype. It ensures road users and AV passengers understand the technology's real capabilities and limitations, preventing overconfidence or misuse. Clear, accurate information builds trust and promotes safe, informed interaction with automated systems. This is something that the PAVE UK initiative[10] sought to do, but further work would be beneficial.

Ends

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[10] See https://pavecampaign.org/uk/