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Intelligent Transport Systems UK
Empowering Transport Technology

Call for Evidence: Statement of Safety Principles for Automated Vehicles Intelligent Transport Systems UK

About Intelligent Transport Systems UK

Intelligent Transport Systems UK (ITS UK) is the national industry association for transport technology. We provide a national platform to support the roll out of technology for a cleaner, safer and more effective transport network, both at home and abroad.

ITS UK has 190+ members, from both the private and public sector, covering all sizes and disciplines, with members working in areas like smart ticketing, mobility as a service (MaaS), integrated transport, real time passenger information, public transport services, traffic management and enforcement, demand responsive transport, road user charging, connected and autonomous vehicles, and much more.

We would be happy to provide further information the submission provided below. If this would be of use, please email ITS UK Public Affairs & PR Executive Eduardo Pitts, at eduardo.pitts@its-uk.org.

Questions and Context: Automated Vehicles: Statement of Safety Principles
This document provides a structured list of all consultation questions from the UK Statement of Safety Principles for Automated Vehicles, including the necessary context for each section. The response to this call for evidence has been developed by ITS UK's CAV Forum, with particular support from the Forum's Officers.

1. Introductory and General Use of the Safety Principles

Context:
The Statement of Safety Principles (SoSP) is required under the Automated Vehicles Act 2024 and is intended to guide safety across pre-deployment (authorisation), post-deployment (monitoring/investigation), and annual safety assessment.

Questions:

- **Question 8:** In your view, are there any other uses for the safety principles we have not identified?
- **Question 9:** In your view, what other uses might there be for the safety principles and why? Provide evidence if possible.

Q8/9	Agree with stated uses and propose additional roles: • As a foundation for insurance standards and liability frameworks. • To guide early-stage trials and international harmonisation (e.g. UK-EU-UNECE). • As a basis for training for emergency services and local authorities.

	• Audit of monitoring and compliance bodies or their establishment
General comment- Pre-deployment (Vehicle Type Approval and Authorisation)	• Support using SoSP to interpret free from unreasonable risk. • Require a quantitative risk profile benchmarked against human drivers. • Include scenario diversity with VRUs, weather, urban complexity. • Require evidence of failsafe and fallback handling in adverse conditions.

2. Pre-Deployment (Vehicle Type Approval and Authorisation)

Context:
Before any automated vehicle can operate on UK roads, it must pass technical checks and demonstrate, through a "safety case," that it will operate at least as safely as a careful and competent human driver.

- The SoSP will set the expectations for what evidence and assurances manufacturers must provide.

Key Characterisation for Questions 3-8:

- The SoSP would guide how "free from unreasonable risk" is interpreted when manufacturers set out their safety case.
- Safety cases would include evidence on intended use, validation testing, scenario assessments, processes for ongoing safety, and modelling/performance benchmarks against human drivers through virtual, track and real-world testing.

Questions:

- **Question 10:** Do you agree or disagree with our characterisation of how the SoSP might be used at pre-deployment?
  Characterisation as above.
- **Question 11:** Why do you think this? Provide evidence if possible.
- **Question 12:** Do you agree or disagree with our characterisation of how the SoSP might be used to inform pre-deployment safety requirements?
- **Question 13:** Why do you think this? Provide evidence if possible.
- **Question 14:** What information do you think would need to be provided pre-deployment to demonstrate consistency with the SoSP?
- **Question 15:** In your view, what considerations should be taken into account when assessing at pre-deployment whether automated vehicles meet the expectations set by the SoSP?

Q10	Support a basis for ongoing compliance checks and investigations. • Recommend monitoring near-miss, disengagements, and infractions. • Use fleet-wide safety KPI reporting across time, geography, and system version. • Define triggers for regulatory intervention based on cumulative trends or degradation.
Q11	SoSP ensures post-deployment safety is not static but continuously evaluated. • Real-world deployment introduces unpredictable behaviours not captured in simulation. • SoSP enables dynamic regulation and supports public trust through transparency. • Early evidence from AV pilot zones (e.g. Waymo, Cruise) should be used to assess divergence rate
Q12	Agree - SoSP provides a fair and measurable framework for pre-deployment decisions. • Encourages developers to align design with regulatory safety expectations early. • Ensures minimum safety thresholds are not only technical but user-focused. • Reduces subjective interpretation across similar platforms.
Q13	Frameworks create consistency and accountability in complex systems. • Prevents fragmented interpretations of safety by different assessors. • Supports early developer clarity by reducing delays and rework. • Aligns AV safety with existing public infrastructure policies.
Q14	Developers should submit a safety case that lists • Comparative metrics against top human drivers (reaction time, hazard response) • System response to edge cases • User experience of safety. • A quantitative risk profile benchmarked against human drivers. • Include scenario diversity with VRUs, weather, urban complexity. • Require evidence of failsafe and fallback handling in adverse conditions. • A Consistent benchmark against which all manufacturers and suppliers of automated vehicles are assessed. Scenario based testing outcomes declared in ODD We also suggest thinking about the key factors below: • KSI rates (AVs vs human drivers) • Avoided collisions and near-misses • Safety-critical aspects, • Technical/software update frequency and response time, • Public complaints and incident feedback.

	• Use AV logs, insurance data, and black box evidence
Q15	Assess AV systems for resilience, inclusivity, and explainability. • Performance consistency across varied real-world and simulated conditions. • Response robustness to sensor degradation and environmental stress. • Ability to monitor and report incidents and support investigations by providing data as regulated within the Data Storage System. • Coverage of ethical dilemmas and case scenarios in the safety case.

3. Post-Deployment (In-Use Monitoring and Investigation)

Context:
After deployment, the in-use regulator and independent statutory inspectors will use the SoSP for ongoing compliance checks, incident investigation, and to support continuous improvement. The focus is on whether vehicles and operators continue to meet safety requirements and learning from individual and aggregate events.

Key Characterisation for Questions 9-14:

- SoSP expected to inform compliance checks, incident reviews, and data/information requirements.
- Leading (risk) and lagging (outcome-based) metrics to monitor and assess safety performance.

Questions:

- **Question 16:** Do you agree or disagree with our characterisation of how the SoSP might be used at post-deployment?
  Characterisation as above.
- **Question 17:** Why do you think this? Provide evidence if possible.
- **Question 16a:** Do you agree or disagree with our characterisation of how the SoSP might be used to inform post-deployment safety requirements?
- **Question 17a:** Why do you think this? Provide evidence if possible.
- **Question 18:** What information do you think would need to be provided to the authorities post-deployment to demonstrate ongoing consistency with the SoSP?
- **Question 19:** In your view, what considerations should be taken into account when assessing, at post-deployment, whether automated vehicles meet the expectations set by the SoSP?

Q16	Agree. SoSP is critical in establishing a consistent framework for regulators to monitor safety post-deployment, ensuring vehicles continue to meet safety case requirements beyond authorisation.
Q17	Allows for dynamic regulation and accountability. Evidence from other sectors (aviation safety) shows that ongoing compliance reduces risk through early detection of failure patterns.
Q16a	Agree. In use safety expectations ensures consistent safety levels are upheld during live operations as AVs encounter evolving environments
Q17a	This depends on if the post-deployment includes pre-deployment checks of updates, patches, fixes, new functionality, etc. Real world deployment introduces variables not fully covered in pre-deployment. A performance based SoSP suggested gives safety assurance across unpredictable use cases
Q18	Some factors are already covered. AV operators should provide logs of disengagements, near-misses, KSI incidents, over the air updates, and public complaints. These should be categorised by geography, time and version Consider: • Near-miss and incident occurrences, with a breakdown of the context and operational parameters • Non-conformance with traffic regulation orders, speed limits, traffic signals, etc. • System errors or failures • Number of hand-back occurrences (where this is relevant) • Occurrences of system shutdown or safe state mode • Authorised updates to the software or hardware • Unauthorised updates to the software or hardware • Unauthorised attempts to modify the software or hardware • Occurrences of the vehicle operating outside of its approved domain
Q19	Review of performance, responses, system degradation handling, and user feedback should inform whether the AV continues to meet SoSP expectations. The circumstances under which infringements have taken place, for example, there may have been issues with signs, signals, road markings, etc that a competent human driver may also have faltered.

4. Setting and Comparing the Safety Standard

Context:
The SoSP must ensure AVs achieve a safety level equivalent to, or greater than, careful and competent human drivers, and ensure overall improvement to road safety. The consultation seeks feedback on how these standards are best defined and measured.

Questions:

- **Question 20:** Provide any evidence you are aware of on the current performance of human drivers.
- **Question 21:** In your view, does human driving performance improve with competence?
- **Question 22:** Why do you think this? Provide evidence if possible.
- **Question 23** In your view, what characterises careful and competent human driving and why?

Q20	DVSA driving test performance benchmarks, STATS19 datasets provide key evidence. Average reaction times, braking distances and collision rates form core baselines.
Q21	Yes, driver experience helps to shape their ability to handle similar situations better in the future, such as driving on snow or at night. However, there are also significant opportunities for driving standards to improve. The courses and manuals offered by the Institute of Advanced Motorists (IAM) and the Royal Society for the Prevention of Accidents (ROSPA) that are only taken up by a small number of motorists could be made mandatory qualifications to continue to maintain a driver's licence. Similarly, regular testing of drivers could also be used to maintain standards and, where appropriate, drive improvements or remove lower performing drivers from the road.
Q22	Motor insurance data and simulator studies show experienced drivers are involved in fewer avoidable incidents which indicates competence improves safety.
Q23	Careful and competent driving is characterised by hazard perception, following rules, anticipatory behaviour, and ethical decision making in high-risk contexts. This also includes behaviours that demonstrate a desire to preserve life, whilst also undertaking efficient progress; empathy to other motorists and vulnerable road users; obeying the rules of the road and driving at a speed that is safe for the conditions.

5. Careful and Competent Automated Driving

- **Question 24&25:** Do you agree or disagree with the considerations we have outlined in thinking about careful and competent automated driving?
- **Question 26:** In your view, how might the assessment of careful and competent driving differ between human drivers and automated vehicles?
- **Question 26a:** Which consideration do you disagree with and why? Provide evidence if possible.

Q234 &25	Agree. The considerations capture both technical capability and human-machine interaction complexity.
Q26	AVs should support consistency, lower reaction latency, and wider field awareness. Like human drivers they cannot rely on intuition hence it must compensate via redundancy and precision. Also consider that the manner in which other road users react and behave around a NUIC vehicle may need to be more rigorously examined when considering the number of near-misses and accidents they are involved in. They should not contravene road traffic rules, such as speed limits, one-way restrictions / no-entries, driving through red signals or under Red-Xs.
Q26a	Suggest deeper focus on ethical and dilemma handling, particularly in scenarios involving multiple vulnerable users (e.g., pedestrian vs cyclist decisions).

6. Implications of Safety Standards

Context:
Explores consequences and potential benchmarks for “equivalent” or “higher than” careful and competent human drivers, and the impact on road safety and public acceptance.

Questions:

- **Question 27:** In your view, what are the implications of setting a safety standard equivalent to careful and competent human drivers?
- **Question 28:** In your view, what are the implications of setting a higher safety standard than careful and competent human drivers?

- **Question 29:** In your view, what characterises a standard higher than careful and competent human driving and why? (consider capabilities, behaviours, or outcomes)

Q27	• It will be challenged in a number of ways, including who decided what the safety performance of a careful and competent driver is, is that level high enough a target and can we, as irrational humans, accept machine fallibility in the same way we do for humans? • The distribution of incident types (near miss through to fatality) that a careful and competent driver will have needs to be considered in the comparison with a NUIC in terms of what may be acceptable. • It does provide a more realistic target for manufacturers of the vehicles, which will have a significant impact on the cost of developing and deploying the vehicles. This may provide more societal benefits than striving for zero harm.
Q28	• Cost – development and implementation will be more expensive, potentially exponentially, as the safety requirements go beyond this. • It may become difficult to define. • It may not aid public acceptance, in fact, it may be more harmful if expectations are mis-managed. • Timescales for implementation will be extended and benefits won't be realised as quickly. This may also reduce the amount of knowledge that can be gained to improve the safety performance of the vehicles moving forwards.
Q29	• A higher standard would involve having the ability to assimilate and process more data to make informed decisions quicker to prevent harm from occurring. This would include a greater level of situational awareness and an extensive bank of past learnings against which to test potential courses of action. There is often an expression of experienced and competent humans as having a sixth-sense, typically an ability to predict something before it happens based on some quite subtle cues, such as the actions of another motorist allowing them to take preventative action before a situation unfolds. A NUIC would need to be able to consistent apply a similar capability to achieve a greater level of safety. • A careful and competent driver behaves highly consistently in their actions, such that other motorists are able to predict what they will do and react accordingly. This may be difficult for a NUIC to improve on.

7. Road Safety for All and Equality Principles

Context:
The consultation highlights equality, fairness, and consideration for all road users (such as vulnerable groups). Seeks views and evidence relating to impact, relevant metrics, and monitoring outcomes.

Questions:

- **Question 30:** In your view, what evidence should be used to assess the safety impact that automated vehicles have on other road users through the hierarchy of road users? Provide specific evidence to support your response.
- **Question 31:** What evidence are you aware of about the safety impact that automated vehicles will have on groups with protected characteristics?
- **Question 32:** Do you agree or disagree that an equality and fairness safety principle should be included within the SoSP?
- **Question 33:** Why do you think this? Provide evidence if possible.
- **Question 34:** Do you agree or disagree that an equality and fairness safety principle should focus on all road users?
- **Question 35:** Why do you think this? Provide evidence if possible.
- **Question 36:** In your view, what metrics, if any, should be considered to support monitoring and evaluation of performance against an equality and fairness safety principle?

Q30	At a minimum, a similar level of detail that would be collected as part of a road traffic collision investigation, even where the incident is a near-miss (at least until the point at which there is confidence in the performance of these vehicles and public acceptance is achieved).
Q31	N/A
Q32	If fairness implies equity, then agree.
Q33	N/A
Q34	Agree.
Q35	The approach should follow the hierarchy of road users.
Q36	The collection of evidence related incidents (including near misses) needs to include the classification of the parties involved and their nature (what type of user were they).

8. Monitoring and Comparing Performance

Context:
Addresses approaches for annual safety monitoring, relevant safety outcomes, sources of information, and comparison between AVs and human drivers.

Questions:

- **Question 37:** In your view, what outcomes should be considered for the monitoring and evaluation of performance against the SoSP?
- **Question 38:** In your view, what sources of information could be used to monitor and evaluate performance of these outcomes?
- **Question 39:** In your view, what evidence sources could be used to compare the safety performance of human drivers and automated vehicles?
- **Question 40:** In your view, what metrics comparing the safety performance of human drivers and automated vehicles should be annually reported on by the Secretary of State for Transport?

Q37	• NUIC vehicles are at least as safe as a careful and competent human driver. • NUIC do not adversely affect the safety of vulnerable road users. • The safety performance of NUIC vehicles improves over time.
Q38	• Directly collected information from the vehicle. • Information collected by official agencies, such as the Police, National Highways, etc. as well as garages / dealerships who are authorised to service and repair NUIC vehicles. • Third-party reporting portals, such as those used by members of the public to share dashcam footage, report incidents, etc.
Q39	• This is potentially a challenging area unless you start to monitor a wide range of human drivers. At present, it is likely that sources of information are limited to those drivers who have agreed to use a black box as part of their insurance policy, systems installed in professionally driven vehicles (HGVs, taxis, etc) and STATS19 / RTC investigations. • There may be scope for drivers to opt into having anonymised data from equipped vehicles shared, where it cannot be used to form a case for prosecution, fines or penalties. However, this would need to be consulted

	on and considered in terms of technical feasibility. Some data is already being collected in this regard by several companies. • We suggest eCall system currently mandated for M1 and N1 vehicles should be continued to be mandated for automated vehicles. It provides emergency services and any regulatory body with immediate digital notification of the identity and location of any AV collision. The learnings currently being captured by DfT about access to this data for conventional vehicles for wider analysis should be considered by AV regulators.
Q40	• Near-misses broken down by the entity the near-miss occurred with, i.e. physical infrastructure, vulnerable road users, other vehicles. • KSIs broken down by the entity the near-miss occurred with, i.e. physical infrastructure, vulnerable road users, other vehicles. • Where possible / appropriate – the breakdown of circumstances under which these incidents occurred.

9. Other Principles and Open Questions

Context:
Discusses principles such as "drive without human monitoring," cyber resilience, and explainability, and seeks feedback on their inclusion or handling elsewhere in the regulatory regime.

Questions:

- **Question 41:** Do you agree or disagree with our proposed approach to these potential principles?
- **Question 42:** Why do you think this? Provide evidence if possible.
- **Question 43:** In your view, are there any other principles you consider should be included within the SoSP?
- **Question 44:** What other principles do you think should be included and why? Provide evidence if possible.
- **Question 45:** Provide any further evidence you wish to submit for consideration on what safety expectations should be set for the deployment of automated vehicles.
- **Question 46:** Any other comments?

Q41	Agree
Q42	• The ability to drive without a human monitoring make sense to include. • Cyber resilience needs to be considered beyond the type approval process, as it forms a key part of the operational life of the vehicle and the data generated that relates to it. This latter part could easily be forgotten and given this is potentially the basis under which you will judge the performance of these vehicles, impacts on its confidentiality, integrity and availability would not be ideal. This feels like it aligns better with overarching cyber resilience regulation, where a common approach should be applied across various sectors and use cases. • AI, like cyber, needs alignment with wider regulation. There will be common themes and principles that apply to both vehicles and other use cases, where the integrity of data and the behaviour of systems is critical to achieving a safety focused outcome.
Q43	Yes
Q344	It may be prudent to consider the impact of NUIC vehicles being deployed on the safety performance of other human driven vehicles, i.e. do they encourage better or worse driving habits and does it therefore create a change in the overall safety performance of our roads.
Q45	N/A
Q46	N/A

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