

# Safe use of Automated Lane Keeping System: Call for Evidence

## Your details

Q1. Your (used for contact only):
<b>name?</b> Richard Cuerden
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Q2. Are you responding:
on behalf of an organisation?

## Organisation details

Q3. Your organisations name is?
Parliamentary Advisory Council for Transport Safety (PACTS)

Q4. Your organisations work is?
Safety and road user groups

Q5. Your organisation is in:
England

## Data storage

Q7. Do you foresee any legal barriers to the police accessing data for incident investigation?
Yes

## Barriers

### Q8. What, in your opinion, are those barriers?

Any data collected as part of a collision investigation will need to be independently validated. The nature and specification of the data, especially the EDR data, are not adequately defined at the time of writing to understand if the information recorded will be sufficient for the purpose of understanding any events. More work is required to define the minimum data requirements (for example should this include images/video), protocols for access to data, validation and analysis. There are questions around the storage of data that must be addressed to, including for example (this is not an exhaustive list): (i) Will it be possible for a vehicle manufacturer, repairer or owner to delete data? (ii) How long must data be stored following any incident? (iii) Where must data be stored? (iv) What are the implications and costs of storing this data? (v) Will Continuous Technical Inspection data be mandated including evidence of software updates?

The introduction of ADAS and automated driving systems has made forensic collision investigation significantly more complicated and police are not trained to undertake this activity, which is increasingly more akin to the work undertaken by the air accident investigation branch. PACTS strongly supports the creation of a Road Collision Investigation Branch

## Driver education

### Q9. How do you think the driver should be:

**educated to understand the abilities and limitations of the system?**

It is worth stating that other systems (e.g. ABS, ESC, ADAS) have been introduced historically without additional training. However, with respect to ALKS consideration is needed around the point of use, which could be via purchase, long-term or short-term hire of the vehicle. When the vehicle is new it is relatively easy to imagine giving the responsibility to the franchised OEM dealer or vehicle lease or hire agency. The UNECE ALKS Regulation will permit OEMs to provide their own design and associated user experience or so-called Human Machine Interface. This variability between vehicles could cause confusion and potentially lead to driver errors. Training could be provided by e-learning modules, face to face theory tuition or in-vehicle training, with the latter being the most comprehensive, but also the most expensive. However, when considering "taking back control", this must be an intuitive action.

**informed to understand the abilities and limitations of the system?**

Training could be provided by e-learning modules, face to face theory tuition or in-vehicle training, with the latter being the most comprehensive, but also the most expensive. However, when considering "taking back control", this must be an intuitive action.

### Q10. What role do you think manufacturers selling this system should play in providing this:

**education?**

Manufacturers selling the systems must be able to demonstrate that they have adequate procedures in place to assure that drivers have been educated in using the system before it can be used. For example, in-vehicle facial recognition to confirm a driver has participated in an on-line e-training course and actively demonstrated understanding of how to use the system and its limitations.

**information?**

The information must be accessible and comprehensive. This starts to raise the question about the need for further qualifications to be able to safely drive/use automated vehicles. More research is required to understand the potential need for what information is required and a key factor will be how harmonised the different OEMs ALKS (and other automated systems) are – we strongly support consistency of control information. The analogy is that the brake pedal is always to the left of the accelerator pedal and the same approach to standardisation and regulation is required for ALKS controls and associated information.

Q11. What role do you think government and its agencies should play in providing this:

<b>education?</b>	Defining the required training framework and establishing the associated minimum standards. This would include answering some "what if" questions, for example, if someone used ALKS and they had not received the approved training (OEM and/or government) and they were involved in an incident would this be a culpability factor?
<b>information?</b>	This will be dependent on the degree of standardisation adopted by OEMs but must include very clear rules of use and limitations of the system.

## Automated and Electric Vehicles Act 2018

Q12. Subject to the outcome of this call for evidence and subsequent consultation, would you have concerns about a scenario where any vehicle approved to the ALKS regulation would be automatically considered to be an automated vehicle under AEVA?

Yes

## Automatic consideration

Q13. Why?

The system is restricted to traffic jam conditions on motorways and only designed for speeds below 60km/h. There remains some ambiguity with respect to the nature of the driver monitoring required. Therefore, more information and definition about the precise regulated use of the system within the UK would be necessary before it could be considered to be an automated vehicle under AEVA.

## Monitoring and control tests

Q14. Do you agree that the criteria in the monitoring and control tests provide a reasonable framework for testing compliance with the AEVA definition of automation?

No

### Why?

The answer to this question is ODD dependent and the choice of maximum speed. Further, we require more evidence that the system will "avoid collisions which a competent and careful driver could avoid". A significant number of casualties on the UK's Strategic Road Network are pedestrians and motorcyclists, and there is no detail in the UN ALKS regulation as to how collisions with these road users will be prevented. There is overlap with the European Union's revision to the General Safety Regulations and regulation of Automated Emergency Braking for pedestrians and cyclists, but without a clear adoption of this by the UK there remain many unanswered collision avoidance questions.

Q15. Do you agree with our preliminary assessment of how ALKS meets the criteria set out in Annex A?

No

**Why?**

More specific work is required to understand the collision avoidance performance of an ALKS operated vehicle and how this will be assessed, covering all potential hazards, e.g. vulnerable road users (VRU = pedestrians, cyclists, motorcyclists) and debris. This should be specified in greater detail, for example will other EU Regulations such as AEBS (vehicle to vehicle and vehicle to VRU) be mandated for fitment? Further, there are unanswered questions around how a manufacturer will “declare and implement a process to manage the safety and continued compliance of the ALKS system over lifetime” – this marks a significant change in roadworthiness responsibility and more detail is required with regard to how this would be regulated. The process for the driver taking over from the DDT and the time (10 seconds) for this to occur requires more explanation and justification. Directly related to the transition from DDT to human driving and the collision avoidance performance of the vehicle is what a driver can do in ALKS mode – when they are technically not monitoring the system. More detail is required about what a driver can and cannot do while the system is active as these factors are all directly interlinked and affect whether ALKS meets the preliminary assessment set out in Annex A and whether an external type approval regulation is more appropriate than a self-certification option.

## Compliance with road traffic rules: detection of enforcement authorities

Q16. How do you think ALKS will detect and respond to a police or other enforcement vehicle approaching from behind signalling for the vehicle to pull over?

As stated in the question and preamble, the UNECE ALKS regulation does not stipulate for this scenario. An ALKS equipped vehicle is not required to respond to a police or other enforcement vehicle approaching from behind and signalling for it to pull over. C-ITS technologies exist to manage this scenario and would require additional regulation to ensure standardised communication and warning protocols for vehicle to vehicle communication. This is being discussed as part of European standards and potential type approval requirements. There is a danger in applying bespoke solutions rather than seeking international harmonisation. The scenario highlights a significant gap in the UNECE ALKS regulation – we believe rearward facing sensors are an essential requirement before a driver can be replaced by an automated DDT.

Q17. Do you think that 10 seconds is fast enough in the foreseeable circumstances to comply with the rules on responding to enforcement vehicles?

No

## 10 seconds insufficient

Q18. Why?

The performance of the system needs to be better defined and evidence provided that 10 seconds is a safe time interval for various hand over use cases.

## Compliance with road traffic rules: stopping after collisions

Q19. How will ALKS detect a minor or low-energy collision, in order to come to a stop and alert the driver?

As currently specified ALKS operated vehicles will not automatically detect all low-energy collisions. For this essential requirement to be met, additional close proximity 360 sensors will be needed, and their performance specified based on validated analysis of real incidents.

Q20. Do you foresee any risks should ALKS vehicles not stop for low-energy impacts?

Yes

## Risks

Q21. What are these risks?

The primary risk is a delay in the emergency services being called and attending, which could result in an untreated serious casualty dying from their injuries. There is also a risk of secondary collisions with vulnerable road users who are incapacitated in the road or with debris. An unknown risk is potential damage to sensors on the ALKS equipped vehicle causing a system malfunction later.

## Compliance with road traffic rules: reading GB road signage

Q22. How will manufacturers ensure that ALKS vehicles deployed in the UK are able to recognise signage located above the road that may be unique to GB?

All pertinent signs that are used on UK motorways must be specified and illumination characteristics quantified and future proofed. Vehicle manufactures must undertake physical tests with all signs that are on motorways, conducted in different ambient conditions. The regulation being developed in the EU for ISA.

## Registration of automated vehicles

Q23. Do manufacturers intend to offer automation as an optional package for customers at the point of purchase?

Yes

Q24. Do you have concerns about vehicles that are registered as AVs on the DVLA database but the keeper has chosen to have the functionality disabled so they are not capable of operating as an AV?

Yes

## Registration of AVs

**Q25. What are they?**

This could cause confusion for subsequent owners of the vehicle and there is potential for inadvertent loss of control if a driver believes they have operated a system and does not realise that it is not operational. There are many unknowns with respect to what could happen, and these depend on how the system has been disabled and if this potentially affects any other vehicle systems, for example adaptive cruise control.

Further, if in the future road use is allocated based on a vehicle's level of automation this could start a unhelpful precedent. It also appears to be in contradiction with the statement in Annex A that a manufacturer will "declare and implement a process to manage the safety and continued compliance of the ALKS system over lifetime".

**Coming to a stop in lane**

Q26. Do you agree that it is appropriate to exempt the driver from prosecution – if the vehicle comes to an unjustified stop when ALKS is engaged – by creating a further exception in the Motorway Traffic Regulations?

No

**Against amending the Motorway Traffic Regulations****Q27. Why?**

If the vehicle comes to an unjustified stop when ALKS is engaged and the driver promptly takes over (in a time to be specified as reasonable based on human reaction to warning and take over) if practicable and proceeds forward the driver should not be prosecuted. However, if the driver does not react in a timely fashion when he/she is capable to do so, this would create a further complication, and it is reasonable to argue that unnecessary delay by the driver to move the vehicle would be negligent.

**Relying on the system**

Q28. Do you agree that amending Rule 150 is sufficient to clarify that the driver may rely on the ALKS?

No

**Disagree amending rule 150 sufficient****Q29. Why?**

We do not believe that drivers regularly read the Highway code. A systematic approach is required and multiple communication channels. This could be affected by whether of not ALKS equipped vehicles are categorised as AVs under AEVA.

**Responding to a transition demand**

Q30. Do you agree that not changing the Motorway Traffic Regulations, except for unjustified stops, ensures the driver is suitably incentivised to take back control when requested?

Yes

## Responding to a transition demand

Q32. Do you agree that The Highway Code should be changed so that drivers of ALKS must be alert to a transition demand?

Yes

## Stopping in lane

Q34. Do you think that amending The Highway Code is sufficient to communicate to drivers their responsibility?

No

### Why?

There is evidence that experienced drivers do not read the Highway code and such a significant change requires targeted communication - simply changing the HC would not reach the target audience.

## Performing other activities

Q35. Do you think the driver should be allowed to perform other activities when ALKS is activated if they must only be ready to respond to a transition demand, with particular reference to any implications for road safety?

No

## Against other activities

Q36. Why?

Research must be undertaken, and evidence gathered before this question can be answered. We are aware of a growing body of international scientific endeavours and these studies must be considered in addition to specific UK analysis.

## Performing other activities

Q38. Do you think that the driver should be allowed to undertake other activities if ALKS is not listed under AEVA?

No

## Against activities

**Q39. Why?**

See answer to Q33: Research must be undertaken, and evidence gathered before this question can be answered. The PACTS Vehicle Design Working Group consider that if other activities are demonstrated to be safe to perform when ALKS is activated, all electronic interactions must be via the infotainment system only.

Driver monitoring technology must be used to ensure that other mobile devices or laptops are not used by the driver. The EU's General Safety Regulations incorporates a future provision for driver distraction monitoring.

**The infotainment system**

Q41. Do you agree that an exception should be added to enable the use of the infotainment system for activities other than driving?

No

**Against on-board infotainment system activities****Q42. Why?**

See answer to Qs33 and Q35: Research must be undertaken, and evidence gathered before this question can be answered.

**The infotainment system**

Q43. Are there any activities you consider unsafe to perform through the infotainment system?

Yes

**Other unsafe activities****Q44. What are they?**

See answer to Q33, Q35 and Q37: Research must be undertaken, and evidence gathered before this question can be answered

**Use of ALKS up to 70mph**

**Q45. Do you agree with this approach?**

No

**Why?**

The current regulation is not designed for speeds above 37mph and further performance requirements and pass/fail metrics would be necessary to ensure safe performance at higher speeds. The current regulation (up to 37mph) does not adequately define performance criteria to mitigate potential collisions or provide evidence-based guidance on what the driver can and cannot do when ALKS is operational. There is also uncertainty about the evidence behind the applicability and safety of the 10 second transition time.

The current regulation is only intended for motorway traffic jam conditions at relatively slow speeds. Increasing the upper speed to 70mph in effect changes the function to automated driving at speeds well above that specified and would extend the time that the function could be used to potentially all motorway driving.

Relying on individual manufacturers' safety assessments for these higher speeds and longer durations of automated driving, would mean a disparate and non-harmonised approach. This would result in different levels of safety offered and potential unintended consequences as different vehicles adopt different actions for given scenarios/use cases (e.g. some avoiding collisions with VRUs and some not); and define their own ODD (e.g. some systems may operate up to 55 or 60 or 70 mph, or only in daylight etc.). This would represent an undemocratic approach to safety and undermine the potential safety benefits that automated driving systems can provide when mandated to protect all road users to the highest cost-effective standards.

**Final comments****Q46. Any other comments?**

The UNECE ALKS regulation should be amended to ensure suitable reference to collision mitigation, driver distraction and Event Data Recorder standards are incorporated.