**Parliamentary Advisory Council for Transport Safety (PACTS) Response to the Law Commissions ‘joint preliminary consultation paper’ on Automated Vehicles**

<https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2018/11/6.5066_LC_AV-Consultation-Paper-5-November_061118_WEB-1.pdf>

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**PACTS Policy on Automated Vehicles**

**Overall principles**

* AVs should comply with traffic laws
* AVs should be required to improve safety substantially, for all road users. They must also make VRUs feel safe, eg not passing close, at speed or braking harshly, except in an emergency.
* AVs should fit existing urban and rural environments – not require significant change (improved signs and lines acceptable)
* VRUs should not be restricted to accommodate AVs (beyond existing restrictions on Motorways and other limited cases, such as some tunnels and bridges.) [Government policy](http://www.pacts.org.uk/2019/01/pacts-submission-to-the-active-travel-inquiry/) is to make active travel modes (walking and cycling) the default for local trips. AVs should support this policy, not work against it.
* AVs should comply with the six ethical principles for robots set out by [Prof Alan Winfield.](http://www.pacts.org.uk/2017/11/the-2017-westminster-lecture-on-transport-safety/)

There needs to be recognition that public perceptions of safety are not entirely “rational”. Comparisons of collision or casualty rates will not be adequate to gain public trust. The public expect much higher safety standards where they are not in control, eg public transport, compared with situations where they are in control, eg driving. The public is likely to expect AVs to be very safe, on a par with public transport. AVs must also feel safe, eg no harsh braking or fast cornering, even if this can be objectively shown as safe.

**Consultation Question 1**

Do you agree that: (1) All vehicles which "drive themselves" within the meaning of the Automated and Electric Vehicles Act 2018 should have a user-in-charge in a position to operate the controls, unless the vehicle is specifically authorised as able to function safely without one?

Yes, all vehicles which are capable of driving themselves should have a ‘user-in-charge’ present who is able to operate the controls, unless the vehicle is specifically authorised to function safely without one.

(2) The user-in-charge:

(a) must be qualified and fit to drive;

We agree that the user-in-charge must be qualified and fit to drive in the case that they are called to intervene. This means they should be in possession of a full driving licence and vehicle insurance. They should be medically fit to drive, ie not suffering an illness that would render them unsafe to drive, be fatigued or impaired from drugs or alcohol, and wearing appropriate vision aids if required.

(b) would not be a driver for purposes of civil and criminal law while the automated driving system is engaged; but

We agree that while the automated driving system is engaged, the user-in-charge would not be classed as a driver for the purposes of criminal and civil law.

When the automated driving system is engaged, the user-in-charge is not in control of the forward or lateral movement of the vehicle. Instead, the ADS determines the vehicles speed and direction of travel, which in turn should mean that in the case of an incident, the vehicle manufacturer, the ADS software developer or the insurer should be considered liable.

(c) would assume the responsibilities of a driver after confirming that they are taking over the controls, subject to the exception in (3) below?

Once the user-in-charge has taken over control of the vehicle, we agree that they assume the responsibilities of a driver.

We believe that there needs to be undisputable clarity when it comes to defining the moment the user-in-charge assumes control and becomes the driver. A simple, standardised procedure for handing control over to the user-in-charge will likely be needed.

This procedure will need to ensure that the system relinquishes control to the user only after that user has confirmed they are in control.

(3) If the user-in-charge takes control to mitigate a risk of accident caused by the automated driving system, the vehicle should still be considered to be driving itself if the user-in-charge fails to prevent the accident.

We agree that if a user-in-charge has intervened, taken over controls and attempted to mitigate the risk of accident caused by the ADS, the vehicle should still be considered to be driving itself if the user-in-charge fails to prevent the accident despite intervention.

That said, there would need to be sufficient evidence available to prove that without intervention, the vehicle would have caused an accident. This is because there could be legitimate concerns over the possibility that users-in-charge may intervene unnecessarily, due to lack of confidence in the system capabilities or lack of understanding of the systems operations.

**Consultation Question 2**

We seek views on whether the label “user-in-charge” conveys its intended meaning.

We believe this may not be a suitable term for a public audience given that the user is, in fact, not always in charge.

In the case of a level 4 AV, for example, it cannot be reasonably assumed that the user is in any way in ‘charge’ of the vehicle. Whilst they may be able to request to intervene and take full control of the vehicle (in which case they become the ‘driver’), when the vehicle is being driven by the ADS, the user is in no way in control of the vehicle or responsible for its operation.

**Consultation Question 4**

We seek views on how automated driving systems can operate safely and effectively in the absence of a user-in-charge.

On the whole, PACTS believes that, given further development and safety testing, automated driving systems could operate safely in the absence of a user-in-charge. However, this may be achievable only under certain circumstances and in certain conditions. Low speeds, lack of obstacles, and clearly defined space for vehicles to navigate are likely characteristics of environments in which it would be safe for automated driving systems to operate safely and effectively without the need for a user-in-charge.

In these conditions, operators of vehicles should have minimum standards for running these vehicles, and should be expected and required to establish and maintain a central control office which would be responsible for supervising the performance of the vehicles remotely, and be capable of taking remote control of the vehicles if necessary.

We see the airport terminal to plane “apron bus” as potential example of a vehicle which may be able to operate and carry out its primary function without the need for a user-in-charge.

**Consultation Question 5**

Do you agree that powers should be made available to approve automated vehicles as able to operate without a user-in-charge?

Given that there are likely to be useful applications for vehicles which do not require a user-in-charge, such as in the example given in our response to the previous question, we believe that the power should be made available to the ‘safety assurance agency’ as previously described.

This is provided the safety assurance agency has performed adequate checks of the vehicles and their operations, and that the vehicles have been approved to be compliant with the safety assurance agencies minimal standards for operating without a user-in-charge.

**Consultation Question 6**

Under what circumstances should a driver be permitted to undertake secondary activities when an automated driving system is engaged?

Until the automated driving system being used can achieve a minimal risk condition, and whilst still recognised to be in the ‘driving’ role, individuals should not be permitted to undertake any secondary activities, beyond those minor tasks currently permitted, when an automated driving system is engaged.

Where the individual is recognised as the user-in-charge and the vehicle is classed as driving itself, secondary activities may be permitted. These permitted secondary activities will need to be carefully defined. We recommend they be limited to use of in-car infotainment/navigational systems.

Ultimately though, this should be defined by the ‘safety assurance agency’. The scope may change with technology, experience and learning over time.

**Consultation Question 7**

Conditionally automated driving systems require a human driver to act as a fall back when the automated driving system is engaged. If such systems are authorised at an international level:

(1) should the fall back be permitted to undertake other activities?

No.

Some situations the vehicle may encounter will require the ‘fall back’, or driver, to respond and to re-take control very quickly. For this to happen safely, the driver needs to be fully aware of this potential need for intervention, and be fully aware of the surrounding traffic movements, as well as the speed limit of the road, the road environment and any previous signs or indicators that suggest a hazard may be up ahead.

We recognise that it may not be particularly easy, nor sensible to simply expect this of drivers of cars which use conditionally automated driving systems (SAE L3). Expecting drivers to maintain full concentration while the vehicle has been driving itself for long periods on the motorway, for example, is unrealistic. Boredom will settle in and drivers may become more prone to distraction.

This is a dangerous situation, especially considering that it is unlikely that a driver who is distracted would be able to intervene and resume control of the vehicle quickly and safely when needed.

We therefore believe that given under conditional automation (SAE L3 systems) human intervention is relied upon to guarantee safety, the fall back should not be permitted to undertake other activities at any time which may distract the driver and impede their ability to respond quickly to any need for intervention when the ADS is engaged.

That said, we do believe there could be additional steps taken to ensure this can be realistically achieved. This could involve additional measures being taken to ensure drivers are made aware of the purpose, capabilities and limitations of their vehicles systems, particularly the assisted driving systems, or additional features being added to vehicles to prevent drivers’ concentration from lapsing.

 (2) if so, what should those activities be?

See above.

**Consultation Question 8**

Do you agree that:

(1) a new safety assurance scheme should be established to authorise automated driving systems which are installed:

(a) as modifications to registered vehicles; or

(b) in vehicles manufactured in limited numbers (a "small series")?

Given that testing and approving the safety of automated driving systems will require highly specialised expertise, we believe that there should be a dedicated safety assurance scheme established for automated driving systems.

This safety assurance scheme should be able to authorise automated driving systems which are installed as modifications to registered vehicles, or in vehicles manufactured in limited numbers.

Considerations should also be given to the on-going assessment of highly automated vehicle roadworthiness, as well as periodic technical inspections such as those currently carried out (MOT tests). Whilst it is unclear what this arrangement will be, or the exact nature of the monitoring, it should fall within the safety assurance agencies remit to ensure that it sets rigorous standards for monitoring the safety of these vehicles’ components (hardware) and automated driving systems (software).

(2) unauthorised automated driving systems should be prohibited?

PACTS agrees that all unauthorised automated driving systems should be prohibited.

**Consultation Question 9**

Do you agree that every automated driving system (ADS) should be backed by an entity (ADSE) which takes responsibility for the safety of the system?

PACTS agrees that every automated driving system should be backed by an entity which takes responsibility for the safety of the system.

Whilst it is likely that each automated vehicle will be manufactured with parts, technologies and software packages from a large number and wide variety of organisations, we believe that one single entity (ADSE) should be responsible for the overall safety of the ADS. The ADSE will need to be technically capable and independent of the vehicle manufacturer, ADS software developer, etc. It should be explicitly and clearly stated who the ADSE is, so that they may be held accountable for the safety of the system.

**Consultation Question 13**

Is there a need to provide drivers with additional training on advanced driver assistance systems?

Yes.

If so, can this be met on a voluntary basis, through incentives offered by insurers?

No, we believe that training should be made available, but not through incentives offered by insurers. It is unrealistic to expect insurers would offer incentives, given the competitive nature of the UK insurance market.

We believe that any features of automated driving systems that are sufficiently common amongst all types of autonomous vehicles should be included in the driver test processes for newly qualified drivers. The purpose and limitations of these features could be tested either through the driving theory test, or the ‘show me tell me’ questions part of the practical test.

We recognise this does not address current drivers. However, we do not believe it should be mandatory for existing drivers to have to be re-tested. We believe instead that the manufacturer should be expected to provide adequate information to existing license holders concerning the purpose, use and limitations of any automated driving systems/technology.

In the case of model specific features, we believe it is also the responsibility of the manufacturer to ensure drivers are adequately trained to have a full understanding of not only how to use these features appropriately, but also the purpose and limitations of the features.

We believe general principles of manufacturers passing on responsibility should be that all training and information should be intuitive and have a reasonable degree of standardisation.

**Consultation Question 14**

We seek views on how accidents involving driving automation should be investigated. We seek views on whether an Accident Investigation Branch should investigate high profile accidents involving automated vehicles? Alternatively, should specialist expertise be provided to police forces.

PACTS has called for the establishment of a Road Collision Investigation Branch, to independently investigate in depth the causes of selected road traffic collisions.

(See <http://www.pacts.org.uk/2017/03/pacts-conference-live-updates/>)

Its purpose would be learning and the prevention of further death and serious injury. It would be independent and distinct from, but complementary to, police forensic collision investigation, which is focused primarily on fault and prosecution and is not designed to provide learning. The DfT has recently moved towards accepting that much more learning could be obtained from collision investigation. It has established the Road Collision Investigation Project, run by the RAC Foundation. However, this is still based on police forensic collision investigation units.

It is important to note that the police have legal powers to undertake such investigations. A new body would also need powers to undertake investigation and to require information and cooperation from AV manufactures, etc., as well as legal protection for their independence. Such powers and protections exist for the current UK Air, Rail and Maritime Accident Investigation Branches.

With regard to the specific consultation question, PACTS agrees that a new capacity is required to investigate high profile collisions involving AVs. We would like to see this as a component part of a broader Road Collision Investigation Branch. However, if that is not possible, at least in the short term, we would support the establishment of a dedicated team to assist the police in the investigation of selected accidents involving automated vehicles.

There are two main reasons for this:

* The interpretation of the vast amounts of data made available through the recovery of automated driving systems’ records (black boxes) is likely to require specialist equipment or specially qualified individuals. Police Forensic Collision Investigation teams are already under resourced, and do not have the specialised training or expertise in automated vehicle technology and automated driving system software, which is likely to be exclusive to individuals within these specialised areas.
* Moreover, as noted above, police forensic collision investigation is focused primarily on fault and prosecution and is not designed to provide learning. Therefore, it may be more realistic to establish a facility that employs automated vehicle specialists to undertake or assist with this.

**Consultation Question 15**

(1) Do you agree that the new safety agency should monitor the accident rate of highly automated vehicles which drive themselves, compared with human drivers?

There may be an opportunity for the Department for Transport and within that, the Centre for Connected and Autonomous Vehicles to act as the government agency responsible for monitoring the accident rate of highly automated vehicles, to allow for comparisons to be made to accident rates of manually driven vehicles.

However, to compare the two types of vehicles relative safety performance by measuring accident rates may not be particularly effective or useful. This is for a number of reasons.

Primarily, this is because both vehicles (at least for the initial years of introduction) will not travel on journeys which could be considered comparable. Automated vehicles, for example, whilst may become visible on all road types, are much more likely to be on roads such as motorways when driven by the ADS.

In addition to this, it is important to note that there is likely to be huge variation in AVs in regards to their functions and the environment in which they operate (some may not even operate on roads where other manually driven vehicles are present, or only operate on roads where only other AVs are present), thus making comparisons difficult.

**Consultation Question 24**

Do you agree that:

 (3) where the ADS has acted in a way which would be a criminal offence if done by a human driver, the regulatory authority should be able to apply a range of regulatory sanctions to the entity behind the ADS?

We support this view and believe that the regulatory authority should be able to apply a range of regulatory sanctions to the entity behind the ADS if it has acted in a way which would be a criminal offence if done by a human driver.

 (4) the regulatory sanctions should include improvement notices, fines and suspension or withdrawal of ADS approval?

We believe all of the above should be included as possible regulatory sanctions.

**Consultation Question 39**

We seek views on whether a highly automated vehicle should be programmed so as to allow it to mount the pavement if necessary:

(1) to avoid collisions;

We do not think this should be permitted. It might put pedestrians in danger and, unlike vehicle occupants, pedestrians have no collision protection.

In addition, pavements (footways) often contain street furniture (lamp posts, for example) that could cause injury to the vehicle occupants. We believe it is unlikely that an AV would be able to weigh up the safety situation on the highway and footway sufficiently quickly or accurately enough to make a safe decision.

We would expect autonomous vehicles to improve safety for all types of road users. We would be concerned with systems which traded off the safety of some road users in order to provide safety benefits for others.

 (2) to allow emergency vehicles to pass;

Yes, conditionally.

It may be that the ability to mount the pavement could be programmed into the automated vehicle. However, it could also be that to actually authorise and execute that movement, the user-in-charge would have to grant consent to the ADS or request control of the vehicle to do this manually.

(3) to enable traffic flow;

We believe it may be acceptable if the driver/system has been directed to and given the authority to do so by a police officer.

Again, it may be that the ability to mount the pavement could be programmed into the automated vehicle. However, it could also be that to actually authorise and execute that movement, the user-in-charge would have to grant consent to the ADS or request control of the vehicle to do this manually, thereby taking responsibility.

(4) in any other circumstances?

Only if the driver/system has been directed to and given the authority to do so by a police officer.

In other circumstances, it may be that the ability to mount the pavement could be programmed into the automated vehicle. However, it could also be that to actually authorise and execute that movement, the user-in-charge would have to grant consent to the ADS or request control of the vehicle to do this manually, thereby taking responsibility.

**Consultation Question 40**

We seek views on whether it would be acceptable for a highly automated vehicle to be programmed never to mount the pavement.

On the whole, we believe that mounting the pavement at anything other than very low speeds could be extremely dangerous and pose a threat to others. However, the best response to this may not be to prevent highly automated vehicles from being able to mount the pavement altogether, particularly given that there may be situations in which it would be favourable to do so. Such as to allow an emergency service vehicle to pass, or if instructed to do so by a police officer.

It may be that the ability to mount the pavement could be programmed into the automated vehicle. However, it could be that to actually authorise and execute that movement, the user-in-charge would have to grant consent to the ADS, or request control of the vehicle to do this manually, thereby taking responsibility.

**Consultation Question 41**

We seek views on whether there are any circumstances in which an automated driving system should be permitted to exceed the speed limit within current accepted tolerances.

An ‘automated driving system’ should not be permitted to exceed the speed limit, “within current accepted tolerances“, except to allow for minor, short term variations in gradient etc.

We believe there are strong safety, ethical, legal and liability grounds for this position, including the following reasons:

* Speed limits have been established in law for good reasons, including safety, traffic flow and environment
* It would inequitable, controversial and, in our view, entirely wrong to permit AVs to do something that is against the law for human drivers.
* One of the most commonly cited reasons to justify ADS being permitted to exceed the speed limit is the potential need to ‘overtake a vehicle as quickly as possible to avoid collision’ or to ‘speed out of danger’. We do not accept this premise. The ADS should be programmed to avoid such situations. Provided the ADS is driving safely, maintaining a safe distance from traffic ahead and remaining constantly vigilant, there should be no reason why the AV could not either pass any obstruction safely within reasonable time and distance (without breaking the speed limit) or, alternatively, slow down or come to a complete stop.
* There has been some suggestion that ADS might be permitted to exceed the speed limit in accordance with current police speed enforcement guidelines (formerly “ACPO” guidelines), ie by 10% + 2mph. This would be wrong and a misunderstanding of the purpose of the police guidelines which are based on the accuracy limitations of enforcement technology and a policy of focusing on more serious speeding offences.
* It is hard to see how, in the event of a collision, the AV manufacturer would not be liable if the vehicle had been deliberately programmed to break the law. The speed limit is stipulated by law; it is not overridden by guidelines.

**Consultation Question 42**

We seek views on whether it would ever be acceptable for a highly automated vehicle to be programmed to “edge through” pedestrians, so that a pedestrian who does not move faces some chance of being injured. If so, what could be done to ensure that this is done only in appropriate circumstances?

We believe that it may be difficult for the AV to navigate and make progress if obstructed by pedestrians, some of whom may obstruct in the knowledge that AVs will stop for them.

That said, we do not support a law that permits the ADS to be programmed to ‘edge’ through pedestrians to the extent that a pedestrian who does not move might be injured. “Edging” forward should be permissible, but “nudging” pedestrians should not.

Instead, the user-in-charge should take over the controls and make decisions as to whether it is safe to move forward. We assume that the vehicle would have pedestrian AEB, and this would prevent collision.