

Motoring of the future inquiry

Submission by PACTS – the Parliamentary Advisory Council for Transport Safety (an All-Party Group)

About PACTS

The Parliamentary Advisory Council for Transport Safety ([PACTS](#)) is an All-Party Parliamentary Group and a registered charity. PACTS' primary objective is to 'protect human life through the promotion of transport safety for the public benefit'. Its aim is to inform both the House of Commons and the House of Lords on air, rail and road safety. It brings together safety professionals, and legislators to identify research-based solutions to transport safety problems having a regard to cost, effectiveness, achievability and acceptability.

Summary

PACTS is positive about the potential for new technologies to deliver substantial safety improvements. However, it is not axiomatic that new technologies will do so. Safety technologies, such as ISA, have been available but rejected in the past. There are also risks that new technologies may increase distraction and deskill drivers. Policy rather than technology is often the key factor.¹

The Government should

- develop a policy framework that sets objectives while allowing the market to innovate and to deliver the means;
- emphasise the need to develop and introduce vehicles which are *substantially* safer than current models;
- increase the focus on safety for non-vehicle occupants – mainly pedestrians, cyclists, and motor cyclists;
- promote technologies that fit the vehicle into the environment rather than fitting the environment around the vehicle;
- focus equally on the potentially harmful distraction effects of new technologies, such as in-vehicle “infotainment”;
- develop legal frameworks and protocols to provide greater access to “blackbox” data for crash investigation and safety research purposes;
- resume a more pro-active and positive role in EuroNCAP;
- be prepared to use a range of interventions, including research, consumer subsidy and regulation, to offset market failure relating to underinvestment in safety.

PACTS recently held a conference, *Driverless vehicles: from technology to policy*, at which these issues were explored and various “driverless” vehicles demonstrated. The proceedings are available, including a summary from the conference chair.²

¹ For an amusing and illustrative insight see: Adam Gopnik, *A Point of View: The ethics of the driverless car*, BBC, 24 January 2014 <http://www.bbc.co.uk/news/magazine-25861214>

² PACTS conference: *Driverless vehicles: from technology to policy*, Thatcham Research 23 October 2014, <http://www.pacts.org.uk/events2/past-events/>

Introduction

PACTS welcomes this inquiry by the Transport Committee. It offers a timely opportunity to review the developments in motoring and to consider whether a stronger policy framework is required in order to maximise benefits and avoid undesirable outcomes. This submission from PACTS concentrates on road safety aspects of motoring of the future.

PACTS submitted evidence to the Committee's *Cars of the Future* inquiry in 2003.³ Although some of the technology has changed greatly since then, many of the policy issues are similar.

PACTS believes that improved road safety should be a key policy objective and regulatory requirement for the development of motoring of the future.

There is currently unprecedented interest in "driverless" cars and vehicles with significant autonomous features are already available for purchase. What appeared to be science fiction only a few years ago is now being talked about as feasible in the medium term – say 10 years.⁴ However, while the technology provides exciting new possibilities, it also gives rise to significant new challenges.

With regard to safety, PACTS believes that technology will continue to advance rapidly while the human driver is unlikely to improve much. Advanced vehicle safety systems – including active and passive safety and various degrees of autonomy – offer the *potential* to substantially reduce road casualties and to improve conditions for all road users.

The UK's good road safety record should not be allowed to deteriorate because of a rush to bring new motoring technology to market. Rather, manufacturers, researchers and Government should use the potential of new technology to further reduce casualties on our roads. The Government should emphasise this by giving road safety prominence when it promotes the development of motoring of the future.

UK road safety record

The UK has one of the lowest levels of road deaths per million inhabitants of any industrialised country – 28 deaths per million inhabitants, (2013). However, road safety is not "solved" even in the UK. 1,713 people were killed and 21,657 reported seriously injured in GB in 2013; the DfT estimates the value of preventing these deaths and injuries to be £14.7bn. Road deaths still are still the largest cause of death for young people (5-25 years). The National Travel Survey estimated that the *total* number of road casualties (including slight casualties and those unreported to the police) was within the range 630,000 to 800,000.⁵

Safety concerns some road user groups more than others, notably children, pedestrians, cyclists, motorcyclists, equestrians and older drivers, whose freedom and mobility can be constrained by fear of danger from motor vehicles.

Taking the base period of 2005-09 set by the government's *Strategic Framework for Road Safety*, by 2013 GB car occupants casualties had declined from 43% to 36% of total KSIs while pedal cyclist casualties had increased from 8% to 14%. See tables below.

³ Transport Committee, HC319 *Cars of the Future*, 7th November 2014
<http://www.publications.parliament.uk/pa/cm200304/cmselect/cmtran/319/319.pdf> (PACTS written evidence in Vol II, Ev 110)

⁴ For example, JLR recently stated that it would produce a driverless car within 10 years.

⁵ DfT, *Reported road casualties Great Britain: 2013*.

Changes in casualties, by road user type, GB 2005-09 to 2013									
Road user type	Deaths: Average 2005-09	Deaths 2013	Deaths: % change by 2013	SI: Average 2005-09	SI 2013	SI: % change by 2013	KSI: Average 2005-09	KSI 2013	KSI: % change by 2013
Pedestrians	613	398	-35%	6,145	4,998	-19%	6,758	5,396	-22%
Pedal cyclists	130	109	-16%	2,398	3,143	31%	2,528	3,252	30%
Car occupants	1,407	785	-44%	11,577	7,641	-34%	12,984	8,426	-39%
Motorcyclists	544	331	-39%	5,776	4,866	-16%	6,320	5,197	-19%
Other	122	90	-26%	1,329	1,012	-24%	1,451	1,102	-26%
Total	2,816	1,713	-39%	27,225	21,657	-20%	30,041	23,370	-25%

Changes in share of total casualties, by road user type, GB 2005-09 to 2013									
Road user type	Deaths: Average 2005-09	Deaths 2013	Deaths: % change by 2013	Serious Injuries: Average 2005-09	SI 2013	Serious Injuries: % change by 2013	KSI: Average 2005-09	KSI 2013	KSI: % change by 2013
Pedestrians	22%	23%	1%	23%	23%	1%	22%	23%	1%
Pedal cyclists	5%	6%	2%	9%	15%	6%	8%	14%	5%
Car occupants	50%	46%	-4%	43%	35%	-7%	43%	36%	-7%
Motorcyclists	19%	19%	0%	21%	22%	1%	21%	22%	1%
Other	4%	5%	1%	5%	5%	0%	5%	5%	0%
Total	100%	100%	0%	100%	100%	0%	100%	100%	0%

In response to the Committee's inquiry questions:

Has the Government articulated a clear strategy for motoring?

We do not believe that an adequate strategy for motoring of the future has been articulated by Government. We note that the Department for Business and Innovation is keen to promote the UK's motoring technology industry as a strategic industry within its industrial strategy and is working with the Department for Transport (DfT) on pilot projects for autonomous or driverless vehicles.⁶ However, the strong impetus behind such projects may mean that the vehicles being tested on public roads have not had to meet safety standards appropriate to the trialling of autonomous vehicles, because safety standards for autonomous vehicle trials have not been created yet.⁷

The limited requirements and guidance in the 2011 Strategic Framework for Road Safety will need updating and strengthening to offer an agreed safety framework for the trialling of autonomous vehicles.

The DfT's *Action for Roads* Command Paper published last year did not strongly link its support for the development of autonomous and semi-autonomous vehicles with safety on the Strategic Road Network.⁸ The Highways Agency (in its new GoCo format) will need to consider how to meet the challenges and opportunities of autonomous vehicles, particularly requirements for vehicle to infrastructure technologies.

The Government also needs to review how it works with local highway authorities to fund and maintain local road networks, something that was noted by the Committee in its recent *Better roads* inquiry.⁹ The entire highway network must meet an appropriate and acceptable standard. In the short term, improved road maintenance will have the benefit of providing a safer environment for all road users. In future, appropriate universal road standards may be required by the sensors used for navigation aids by autonomous vehicles.¹⁰ However, although the Highways Agency will be carrying out maintenance on 80% of the Strategic Road Network by the end of this funding period, under the current settlement local authorities have been given a separate highway budget with funding much more thinly spread and not allocated to maintenance.¹¹ This should be addressed in the next funding period, when sufficient money must be allocated for road maintenance at a Government level.

The Government must develop a framework for how the current mix of vehicles on roads will change into one including an increasing proportion of autonomous vehicles. It is not clear how current manually driven vehicles will integrate safely with new, autonomous vehicles.¹² It is also not certain how foreign vehicles – which may have different specifications – will fit into the UK's system for autonomous navigation. The Government needs to pro-actively engage in discussions regarding European manufacturing specifications for such vehicles.

⁶ 'UK Government fast tracks driverless cars', Department for Business, Innovation and Skills press release, 30 July 2014; 'Intelligent Mobility: A national need?' UK Automotive Council 2011

⁷ 'Autonomous Road Vehicles', POSTNote number 443, September 2013

⁸ 'Action for Roads,' Department for Transport, 2013

⁹ 'Better roads: improving England's strategic road network', House of Commons Transport Committee, 2014

¹⁰ 'Autonomous Road Vehicles', POSTNote number 443, September 2013; Evidence of Dr Raj Rajkumar, Professor, Electrical and Computer Engineering Department, Carnegie Mellon University, to the Committee on Transportation and Infrastructure, US House of Representatives, 2013

¹¹ 'Maintaining Strategic Infrastructure: Roads', National Audit Office, June 2014

¹² 'Autonomous Road Vehicles', POSTNote number 443, September 2013

How effective are the steps that the Government is taking to support technical development in motoring and what actions should it be taking to develop the necessary financial and legal frameworks?

The Government is proceeding quickly to promote the development of autonomous vehicles. It has announced a £10 million budget to fund a driverless cars trial in three cities for 18 to 36 months from January 2015. We agree there is a potential industrial and transport benefit in such initiatives, but there must be frameworks in place to ensure safety. We expect that only well-practised drivers will be allowed to participate in testing the autonomous vehicles on public roads from next year. We suggest that these drivers must be satisfactorily trained in taking command of the vehicle (overriding the computer if necessary) before they take the vehicle on the road.

The initial legal frameworks will need to cover the testing of autonomous vehicles on public roads. Only once testing identifies the risks of autonomous vehicles and these risks have been appropriately addressed can legal frameworks for the normal operation of autonomous vehicles be developed. There will need to be a thorough review of road traffic laws, which should include developing new principles about the responsibility for crashes, including under what circumstances a driver could attribute blame for an accident to the failure of the computer or software operating a car.¹³

We are concerned about a safety risk from driver deskilling as drivers take less of a role in managing their vehicles. New driver skills may be needed, to ready drivers for situations in which they may have to take control of their vehicles unexpectedly and in a moment of crisis. Drivers must be prepared to adapt quickly to such a situation. We expect that the requirements for driving tests will be reviewed to address these new challenges for drivers. There will need to be an agreement with insurers regarding the risks of driver deskilling and whether new arrangements such as pay-per-drive are needed.¹⁴ However, any system which requires a previously inactive driver to take control in a dangerous situation, with only seconds to act, is inherently unsafe; training will not overcome this.

How effective has the Government been in setting priorities for research and development and what further actions should it take?

The Government must act to provide a robust code of practice to ensure that developers of new motoring technology understand the safety criteria that their products must meet. The UK founded the European New Car Assessment Programme (EuroNCAP) in 1997 and it is now backed by the European Commission, seven European governments and motoring and consumer organisations in every European country.¹⁵ We were disappointed that this Government reduced the UK's involvement in EuroNCAP when it came to office, although there has been some re-engagement recently. It is reasonable that the car safety assessment programme exists at a European level as similar models of vehicle are sold throughout Europe. The UK must resume a full, pro-active and positive role within EuroNCAP.

The Government should consider the opportunity to influence or commission research and development of new vehicle technology where the market is not effective. Without some degree of incentive or regulation, the market is unlikely to deliver the full range of safety benefits, particularly

¹³ 'Autonomous systems: Social, legal and ethical issues', Royal Academy of Engineering, 2009; 'Driverless vehicles: liability and new automotive technologies', The In-House Lawyer, June 2013; 'Autonomous vehicle technology: a guide for policymakers', RAND Corporation, 2014

¹⁴ 'Autonomous Vehicles: Handing over control: opportunities and risks for insurance', Lloyd's 2014

¹⁵ www.euroncap.com

for non-occupants. Market intervention has already been used to further environmental objectives – for example, the £5,000 per vehicle electric car subsidy and the car scrappage scheme.

New safety systems will be possible with new vehicle technology, such as autonomous emergency braking. Some dangers due to the state of roads could also be dealt with, by enabling the sensors used by a vehicle to detect its position on the highway to report road defects to highways agencies. However, many of these opportunities will need to be developed by or for the Government, as the profit from such projects may be less than that from improved in-car entertainment systems and the opportunity cost of working on safety systems may therefore be too high for many developers.

Will research and development in, for example, alternative fuels, safety systems or driver aids, make a significant impact on mass-market vehicles by 2040, and how likely are changes that would make motoring of the future profoundly different from motoring today?

A growth in traffic in some areas, combined with inevitable limitations on road capacity, will mean that technology that enables an increased level of traffic to fit into the existing highway network and will be in demand. The reliable operation of the highway network will be of great importance to the economy. The impact that road traffic crashes have on highway reliability is very significant.¹⁶ In order to reduce casualties and to maintain the economic benefit of the highway network, safety should be a priority for future research and development. It is not acceptable for this to be a lower priority for industry.

The development of a digital speed map for the UK could help improve adherence to speed limits. Transport for London has developed such a map for London and we would like to see one provided for the whole country.¹⁷

What evidence is there to show that the Government is coordinating its policy making with other Governments and the European Union to achieve joined-up transport outcomes and to establish universal standards?

We would like reassurance that this coordination is taking place. We are aware that a substantial amount of vehicle regulation occurs at an EU level and would like to understand how the Government is working with the UK's technology developers to ensure that the EU safety requirements are met. Without deterring innovation, there needs to be sufficient commonality of operating systems for autonomous vehicles and other future technology agreed at an international level to avoid the problems caused when incompatible systems are introduced, as happened with the charging systems for electric cars.

What role does the Government have in ensuring that the UK has the necessary infrastructure – for example refuelling networks or vehicle-to-infrastructure data networks – to facilitate motoring of the future?

The Government must ensure that well-maintained road infrastructure is in place across the whole of the highway network to allow autonomous vehicles and driverless technology to function. As Government policy is to promote the development of this technology, it must take responsibility for ensuring that the roads are in a fit state to allow the technology to operate.

The Government must establish how data protection laws limit the ability of researchers to use information that might be taken from computer systems and “black box” recorders on vehicles in

¹⁶ ‘Delays due to serious road crashes’, RAC Foundation, 2010

¹⁷ www.tfl.gov.uk/cdn/static/cms/documents/isa-terminal-signs.cml

future. PACTS believes there are substantial safety gains to be made if crash data and other vehicle and driver behaviour data were more widely available. The public will need to be convinced of the benefits from and the safeguards to using such data for research and development.¹⁸

It is unclear if autonomous vehicles will be able to cope with complex conditions such as shared use areas, congested city centres or historic street layouts. There are suggestions that the road network should be simplified and standardised in order to safely accommodate such vehicles. PACTS would urge that the motoring of the future be required to fit the kind of environments in which people wish to live rather than adapting our environments to fit the motor vehicle.

¹⁸ 'Autonomous systems: Social, legal and ethical issues', Royal Academy of Engineering, 2009