



UK Road Safety

# SEIZING THE OPPORTUNITIES

## *SAFER VEHICLES*

A paper for PACTS by Paul Fay  
*Independent Vehicle Safety Expert*



*•PACTS is grateful to the Rees Jeffreys Road Fund and to the Road Safety Trust for their financial support for this project.*

# *UK Road Safety – Seizing the Opportunities*

## *Safer Vehicles*

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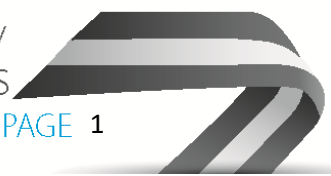
May 2017

This paper explores the challenges and priorities for achieving safer vehicles and the opportunities identified in the UK Government's *Working Together to Build a Safer Road System – British Road Safety Statement* of December 2015. It is one of three papers in the PACTS project UK Road Safety – Seizing the Opportunities. The other papers address safer roads and safer road users.

Paul Fay is now an independent vehicle safety design expert following many years as Vehicle Safety Manager at Ford Motor Company. He is a member of the PACTS Vehicle Design Working Party.

### **Acknowledgements**

This review was only possible with the input from members of PACTS Vehicle Design Working Party (chaired by Richard Cuerden) and other interested stakeholders. The author is grateful for all their contributions. Responsibility for the views expressed here lies with the author. They do not necessarily represent the views of PACTS, the Road Safety Trust or the Rees Jeffreys Road Fund.



## Summary

Safe vehicles is one of the five pillars of the Safe System approach to road safety. The safety of vehicles has improved greatly over recent years. This is the result of innovation by manufacturers, safety regulation and incentives schemes, notably Euro NCAP. The UK has played prominent roles in these. Passive safety systems, designed to reduce injury to occupants and pedestrians in the event of a collision, have been followed by active safety systems designed to help avoid collisions. These have helped to substantially reduce the number and severity of casualties. Current developments in autonomous vehicle technology appear to offer the prospect of another major safety gain.

This paper reviews the priorities and opportunities to further reduce casualties through safer vehicles. It then assesses the extent to which these are recognised and addressed by the UK Department for Transport's Road Safety Statement "*Working Together to Build a Safer Road System*". It was completed with input from members of PACTS Vehicle Design Working Party and other interested stakeholders.

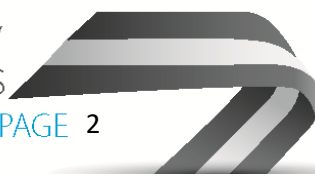
A review of the road casualty statistics confirms that the Statement has identified the appropriate priorities. In particular, the need to address vulnerable road users (pedestrians, pedal cyclists and motorcyclists) and to encourage the faster uptake of safer vehicles, particularly cars.

The Statement identifies a number of major challenges and opportunities. This review shows general agreement with many of these, but clarification is needed on some actions, such as what is intended for improving the roadworthiness of current fleet and reducing driver distraction. The withdrawal of the UK from the EU is identified as a major new challenge, unknown at the time the Statement was drafted. As a result, this paper considers the implications of Brexit on vehicle safety.

There follows a review of the specific proposals in the Statement and a discussion of some of the key issues. This analysis (tabulated in Appendix A) shows broad agreement with most of the proposals (especially those promoting safer vehicles, preparing for connected and autonomous vehicles and encouraging improved HGV safety), but recommends clarification on other issues, such as driver distraction, promoting safety equipment and bus and taxi operations.

The discussion of the proposals for the short-term focusses on the fast progress in developing safer vehicles. In recent years manufacturers have rapidly introduced new safety technologies and systems, which have been encouraged and recognised by Euro NCAP and others. In addition to voluntary changes, new European Union vehicle regulations have been introduced, for example requiring Autonomous Emergency Braking and Lane Departure Warning for HGVs. These vehicle safety developments will contribute to casualty reductions as the fleet is renewed over the short to medium-term. It is therefore important to focus today's research and policy resources on future vehicle design safety improvements that will most likely align with our future road user casualty prevention priorities and have the most benefit for society. It is likely that vulnerable road users will form an increasing proportion of those killed and injured on our roads in the next 5 to 10 years.

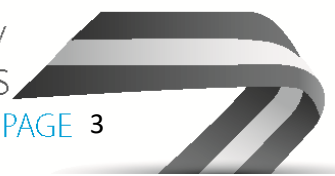
For the medium term, the review has identified a gap in proposals for approving, maintaining and extending the regulated safety standards for vehicles sold in the UK after leaving the EU. Clarification and assurances are needed on the UK's future involvement in negotiations and on-going commitment to EU regulated safety requirements. Any international trade agreements with non-EU partners must include equal safety standards.



In the longer term, the discussion outlines the need for a greater focus on UK research activities, stresses the need for real testing of connected and autonomous vehicles, and reinforces the need for a strong UK role in the future developments of regulations and Euro NCAP standards.

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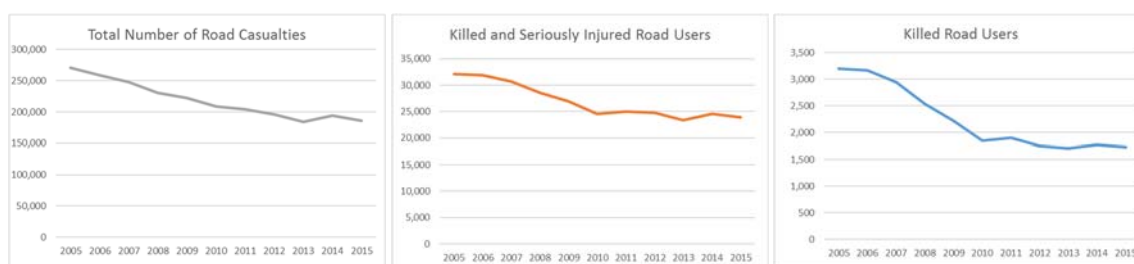


# UK Road Safety – Seizing the Opportunities

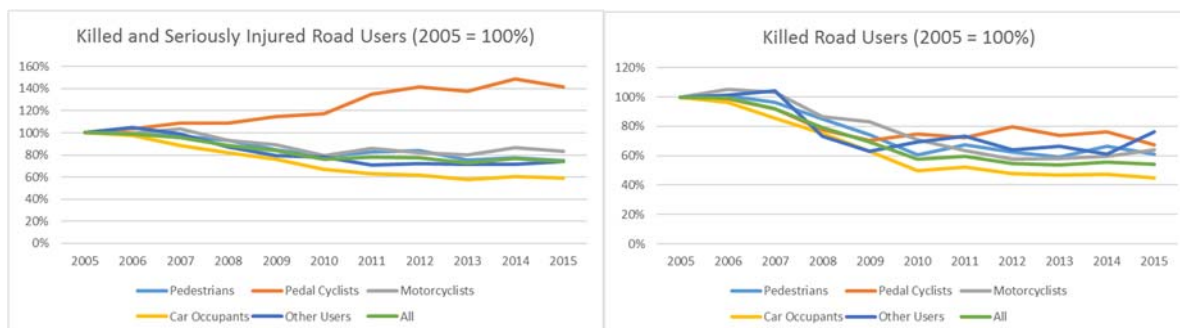
## Safer Vehicles

### Data analysis and review of key priorities

The UK's record on road safety is among the best in the world.<sup>1</sup> Over many decades, significant progress has been made in reducing road user casualties. In particular, the years between 2005 and 2010 saw very large reductions, especially for fatalities.<sup>2</sup> In more recent years however, there has been less progress and the number of casualties appears to have levelled off.



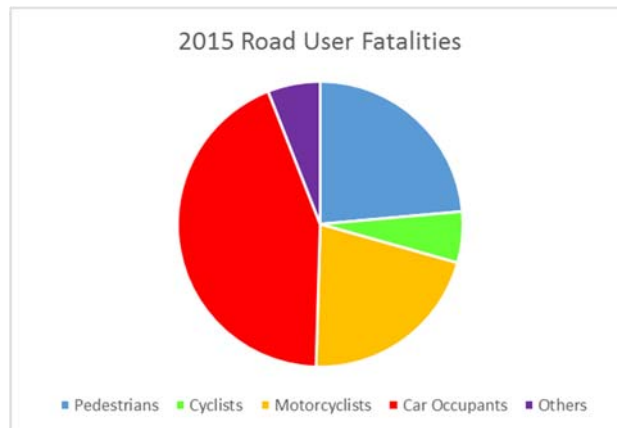
In 2015, official statistics report that there were over 186,000 casualties on Britain's roads. Of these, nearly 24,000 were killed or seriously injured (KSI) and 1,730 were fatally injured. The proposed Safe System approach, including a contribution from "Safer Vehicles", should enable these casualty numbers to fall further, provided the correct actions are identified and prioritised.



Looking at the trends for different road user types, it can be seen that since 2005, the greatest progress has been made for car occupants (who have seen a 40% reduction in KSIs and a 50% reduction in fatalities), whilst less progress has been made for vulnerable road users.

<sup>1</sup> Understanding the Strengths and Weaknesses of Britain's Road Safety Performance, TRL Published Project Report PPR796, September 2016.

<sup>2</sup> Reported road casualties in Great Britain: main results and tables 2015, DfT Statistical Release, June 2016. Available at: [www.gov.uk/government/statistics/reported-road-casualties-in-great-britain-main-results-2015](http://www.gov.uk/government/statistics/reported-road-casualties-in-great-britain-main-results-2015)



Looking more closely at fatalities, the 2015 figures show that car occupants are the largest single group (at 44% of the total) despite the big reductions, but also that vulnerable road users in total (pedestrians, cyclists and motorcyclists) now account for 50% of the total road deaths.

Car user casualties have reduced since 2005 because of a combination of factors, including vehicle and road design improvements and potentially changes in the way vehicles are driven. Vehicle safety design has contributed in two measurable ways:

- Primary safety measures – those which prevent collisions or mitigate their consequences, such as Electronic Stability Control (ESC); and
- Secondary safety measures – those which prevent or mitigate injuries in the event of a collision, such as better vehicle crashworthiness and enhanced restraint systems (seat belts and airbags).

The estimated benefit of ESC varies, from a reduction of about 7-8% of all car accidents (Frampton and Thomas<sup>3</sup> in Great Britain and Dang<sup>4</sup> in the U.S.A.) to much higher values. The effectiveness for reducing fatal impacts is generally higher (25% from Frampton and Thomas, 14% from Dang). Statistical modelling<sup>5</sup> has identified that 11% of fatalities will be prevented by 2020 in GB due to secondary safety improvements. The secondary safety improvements have been built on the mandated front (UN R94) and side (UN R95) impact regulations; and manufacturers have typically developed their car structures and restraint systems to meet the more demanding Euro NCAP test procedures. Notably, most cars now achieve good injury reduction metrics for the side pole impact, which encourages side curtain airbag protection.

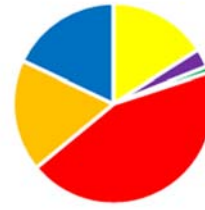
It is also useful to consider the differences in crash types affecting the different road user groups.

<sup>3</sup> Frampton, R., and Thomas, P. (2007). Effectiveness of Electronic Stability Control Systems in Great Britain. VSRC, Loughborough University, PPAD 9/33/99 (C)

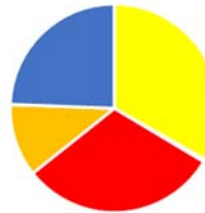
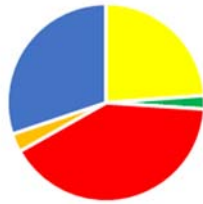
<sup>44</sup> Dang, J. (2007). Statistical analysis of the effectiveness of electronic stability control (ESC) - Final report. NHTSA report (DOT HS 810794), USA.

<sup>5</sup> Cuerden, R *et al.* (2015). The potential for vehicle safety standards to prevent road deaths and injuries in Brazil. TRL Published Project Report PPR766.

Pedestrian Fatalities (408)    Cyclist Fatalities (100)



Motorcyclist Fatalities (365)    Car Occupant Fatalities (754)



- Single Vehicle Impact
- Impact with Car
- Impact with Bicycle
- Impact with HGV
- Impact with Motor Cycle
- Impact with Other / Multiple Vehicles

For pedestrians, impacts involving cars account for two thirds of the fatalities. For cyclists, the picture is slightly different as impacts with HGVs and events involving no other vehicles become more important, but impacts with cars still account for 44% of fatalities. Over half of motorcycle fatalities occur in single vehicle crashes or more complex crashes involving multiple vehicles. Despite this, over 40% of motorcycle fatalities occur in crashes with a single car. Finally, around one-third of car occupant fatalities occur in single car crashes and another one-third in crashes involving one other car.

This analysis shows that, if the number of road casualties in Britain is to be reduced further, attention must be given to vulnerable road users (especially in impacts with cars) and car occupants (in both single vehicle crashes and impacts with other cars). There is also good justification for highlighting impacts between HGVs and cyclists and pedestrians, although the absolute numbers are lower than for impacts with cars. Clearly in addressing these prioritised areas, aspects of road design and road user behaviour will be important but safer vehicles can, and will, make a significant contribution.



## British Road Safety Statement

### Priorities

The above conclusions are broadly in line with the priorities highlighted in the British Road Safety Statement on *Working Together to Build a Safer Road System*<sup>6</sup> (see below) particularly the need to address the safety of vulnerable road users and encourage the faster uptake of safer vehicles.

#### **Working Together to Build a Safer Road System – Key Priorities for Safer Vehicles**

- Protecting **vulnerable road users**, including pedestrians, cyclists, motorcyclists and horse riders, through ... vehicle improvements.
- Working with the insurance industry to ... **reward the uptake of new technologies** ... that are proven to reduce collisions.
- Reduce road related collisions at work through **improved HGV safety**.
- Encouraging the **faster uptake of safer vehicles** via the promotion of clear consumer information and the procurement of safer vehicles.
- Promoting the development and adoption of **connected & autonomous vehicles**
- Underpinning policy with robust **evidence, research & evaluation**.
- **Working in partnership** with public, private sector and civil society organisations to save lives.

### Major challenges and opportunities for safer vehicles

The Road Safety Statement identifies the following challenges and opportunities:

- Improving the road worthiness of the current vehicle fleet
- Accelerating safer vehicle adoption
- Legislating for connected and autonomous vehicles
- Tackling dangerous technological distractions.

In reviewing these, the first, “improving road worthiness of current fleet”, appears somewhat as a surprise. This issue is not mentioned in detail anywhere else in the Statement and it is not clear what the concern (or even opportunity) is. It is also surprising given that DfT is carrying out a consultation

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<sup>6</sup> Department for Transport, *Working Together to Build a Safer Road System: British Road Safety Statement*, (London, December 2015)





exercise to delay the first MOT test on some vehicles from 3 years to 4 years<sup>7</sup>. Although the effect of this proposal on vehicle safety may be small, it does not seem to support the aim to improve road worthiness of the current fleet. Further discussion is welcomed about the background for the inclusion of this topic in the Statement and any proposal for how to address it.

It is agreed that the next two items (adopting safer vehicles and connected & autonomous vehicles) provide both challenges and opportunities and these are discussed further below in connection with the specific proposals.

The final item (tackling distraction) is acknowledged as an issue, but there needs to be greater understanding and clarity about the extent to which this is a vehicle safety issue rather than a user behaviour / enforcement issue. Further discussion is required on this issue.

In light of the 2016 referendum result, the obvious challenge missing from this list is the implications of the UK withdrawing from the EU. Clearly the EU has a major role in setting, approving and maintain vehicle safety standards in the UK and in coordinating much of the research into safer vehicles. Although details about how “Brexit” will be achieved are still under development, a preliminary review of the possible implications for vehicle safety are given in the sections below.

### Review of specific proposals

The final stage of the review was to consider the specific proposals contained in the Statement and to provide a discussion of some of the key issues. The review of the items is tabulated in Appendix A for ease of reference. This analysis shows broad agreement with most of the proposals (especially in promoting safer vehicles, preparing for connected vehicles and encouraging improved HGV safety) but seeks further clarification on other issues (such as driver distraction, promoting safety equipment and bus & taxi operations). A number of the items warrant further comment and discussion. These items are covered below, split into short, medium and longer term items.

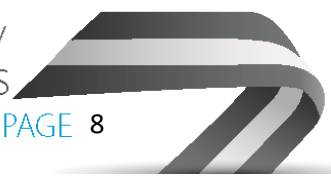
### Short term actions

There is no doubt that the safety of vehicles has improved enormously over the last two decades.<sup>8</sup> Technological advances (particularly in the field of sensors and electronics), new materials (e.g. high strength, low weight steels) and new design and testing methods have led to vehicles offering much greater protection in collisions and well as enhanced capability to support the driver in avoiding crashes happening in the first place. This progress has resulted from a mixture of legislative action, manufacturers’ initiatives, competitive pressures and, increasingly, by encouragement and recognition in consumer safety rating programs such as Euro NCAP. New cars on sale today must be equipped with active safety technologies such as Electronic Stability Control (ESC) and must meet regulatory crashworthiness standards in front, side and pedestrian impacts. However, current safety performance for most cars go way beyond these minimum standards. Vehicles getting 5-star Euro NCAP ratings today can only do so by meeting much higher crash test performance levels and by being

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<sup>7</sup> DfT Consultation Document – “Extending the date of the first MOT test from three years to four years”, January 2016

<sup>8</sup> Louise Lloyd, Caroline Wallbank, Jeremy Broughton & Richard Cuerden (2017) Estimating the potential impact of vehicle secondary safety regulations and consumer testing programs on road casualties in emerging markets. Journal of Transportation Safety & Security, Volume 9, 2017 - Issue sup1: Road Safety in Developing Countries.



fitted with many more advanced active safety features, particularly Autonomous Emergency Braking (AEB). It is laudable that, as a result of action by many different parties (e.g. manufacturers, suppliers, NCAPs, insurers), these safety features are becoming increasingly common place on the latest cars, even the smallest, lowest cost models – those that sell in high numbers.

These developments have happened relatively quickly, especially when compared with the fleet replacement time in the UK.

The average age of a car in the UK is 7 years old. From 1<sup>st</sup> November 2014, all cars sold in the UK had to have ESC fitted and although significant numbers of cars sold before this date had ESC, the full benefits of the technology will take years to be realised. AEB and Lane Departure Warning (LDW) systems on heavy-duty vehicles were introduced from 1<sup>st</sup> November 2013 for new types of vehicle and 1<sup>st</sup> November 2015 for all new vehicles. The average age of an HGV in the UK is significantly greater than passenger cars and this technology will take many years to become standard fit in the commercial vehicle fleet.

A similar situation is occurring today with AEB and Lane Keep Assist for passenger cars, with only some manufacturers offering the technology as standard. Euro NCAP has an important role to play to encourage higher fitment rates, but without cost-effective regulation, today's voluntary uptake rates of these technologies will not realise their full potential to prevent deaths and injuries on our roads. The technologies should be offered as standard and not expensive options for the buyer to choose.

However, there is considerable “good news” in the pipeline as older vehicles will continue to be replaced with newer models meeting the latest equipment and protection levels. It is unfortunate that the older cars are also often driven by the highest risk drivers and are involved in many of the most serious and fatal accidents.<sup>9</sup> The constant replacement of older vehicles with newer ones will continue to get these high-risk drivers into increasingly safer vehicles.

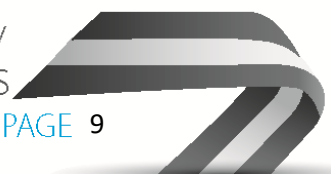
The renewal of the fleet can be regarded, at least from a governmental perspective, as “low-hanging fruit” and is likely to deliver the fastest returns in terms of road casualty reduction. The necessary research, invention and design has been done and the appropriate regulatory actions taken. In the short to medium time frame, what is required is a continual renewal of the fleet with the safest vehicles. Without specific actions to increase turnover of vehicles, it will take many years for the latest life-saving technologies to fully penetrate the vehicle fleet and trickle down to the highest risk users. Previous experience (e.g. the slow take up and fleet penetration of ESC) has demonstrated the need for greater promotion, subsidy or tax incentives in order to speed up fleet penetration. The actions proposed in the Statement could go a long way to raising awareness of and promoting purchase of safer vehicles. However, at this stage there are no firm proposals or any obvious progress in encourage safer vehicles through public procurement.

The objectives proposed in the Statement to promote safer vehicles rely quite heavily on the work carried out by Euro NCAP. Aside from regulation, Euro NCAP's assessment protocol are probably the most important factor influencing the safety performance of cars in Europe. The UK was the major player in its inception and early activities and should be rightly proud of the role it played. In more recent years, the UK government has taken more of a “hands-off” approach and has had less influence on its rapidly changing strategic and technical developments. Whilst it is pleasing that the UK has

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<sup>9</sup> Department for Transport, 2010. The Characteristics of Speed Related Collisions. Road Safety Research Report 117, p48.

<http://webarchive.nationalarchives.gov.uk/20120606181145/http://assets.dft.gov.uk/publications/the-characteristics-of-speed-related-collisions/rsrr117.pdf>



committed to membership of Euro NCAP for the coming years, DfT should review its role within the organisation and look for opportunities to influence its future direction to give the best effectiveness for improving the performance of the UK's vehicle fleet. In particular, the strong involvement of the UK in Euro NCAP (through DfT and other sponsors/interested parties) maintains pressure in ensuring that the performance of right hand drive versions is included in the assessments and that equipment standardisation levels also apply to vehicles sold in the UK.

In addition, the implications of Euro NCAP assessment criteria changing over the years needs to be understood, communicated and addressed in order to avoid consumer confusion and misleading conclusions. The step changes in Euro NCAP's protocols, assessment criteria and rating thresholds in many recent years mean that a vehicle could achieve a 5-star rating in one year, whilst a vehicle with identical performance and equipment levels might achieve a rating which is 1 or 2 stars lower if tested a few months later. There is no simple solution to addressing this – it is a result of Euro NCAP's ambitious Road Map, encouraging higher performance and equipment levels – but it needs to at least be considered if purchasing decisions are to be linked in some way with star ratings.

Finally, it is recommended that DfT develops summary indicators to measure progress in the area of promoting safer vehicles. These could be based, for example, on proportion of vehicle fleet equipped with key technologies (e.g. ESC and AEB).

#### Medium term actions

In between the short-term actions described above and the commitment to longer term items such as Connected & Autonomous Vehicles, the Statement appears to have a significant gap in the medium term and, in particular, about the UK's approach to future regulated vehicle safety standards.

#### Brexit

In recent years, the EU has had a significant influence on vehicle safety standards in the UK. Following the referendum in June 2016, the UK decided to withdraw from the EU and the withdrawal negotiations have started. At the time of writing, there is still a lack of clarity and debate about how Brexit will be achieved, but there are undoubtedly some implications for vehicle safety standards and approvals in the UK.

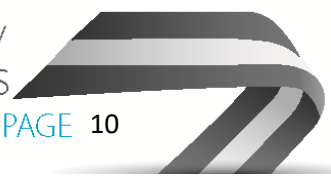
Fortunately, the first indications are that there is no reason for immediate panic. Although part of the case for leaving the EU was to free the UK from unwanted red tape and regulation, there does not appear to be any desire to walk away from current high levels of regulatory vehicle standards in place in the UK (as in the rest of the EU). The initial government position (expressed by both the Department for Transport and the Department for Exiting the European Union) is that all applicable EU law at the time of the UK exit from the EU will be replicated as UK law.<sup>10, 11</sup> The UK was very influential in establishing these standards and early indications suggest that vehicle manufacturers do not want unique UK requirements either. In addition, the necessary regulations and the approvals processes and infrastructure are already in place.

If it can be assumed that the UK will continue to maintain the full EU Type Approval requirements as a condition for registering vehicles in the UK, there are a number of questions which would need to be resolved in the inevitable detailed technical discussions.

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<sup>10</sup> Letter from DfT Minister of State Rt Hon John Hayes to PACTS, 24 March 2017

<sup>11</sup> DExEU Great Repeal Bill White Paper "Legislating for the United Kingdom's withdrawal from the European Union", Section 1.24, 30 March 2017



At present, the approval and homologation process for the UK is fully integrated into that of the EU. The key question is how this will be managed immediately after Brexit. The following questions will need to be addressed:

- How exactly will relevant EU law be replicated in UK law? In particular, how will references to the EU approval process and organisations be handled?
- What processes will be used for approving / certifying / homologating vehicles for the UK?
- Will existing EU Whole Vehicle Type Approvals (WVTA) and other approvals remain valid for vehicles being sold in UK? And vice-versa?
- What will be the future role of Vehicle Certification Agency?
- Will the UK accept / require EU approval?
- How will the UK coordinate the full compliance and approval procedures (e.g. how to test and monitor and what to do if vehicles fail)?
- Are there opportunities for mutual recognition / acceptance?
- What can we learn from the experience of non-EU European countries such as Switzerland and Norway?
- How will the UK benefit from changes to the WVTA process following the issues regarding vehicle emissions testing?
- Are there unique UK opportunities for small series / individual approvals?

This all applies to the current requirements. It is also important that the UK clarifies and strengthens its role in the future developments of regulated safety standards.

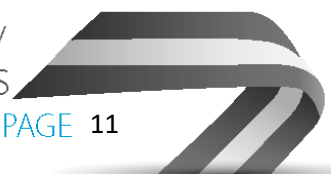
At present, there is a significant review of future EU safety requirements taking place. This European Commission funded activity is analysing a large number of future items (e.g. AEB, Intelligent Speed Assistance (ISA), better direct vision for trucks, improved pedestrian protection in the event of a collision) which may be included in the 2018 revisions to the General Safety and Pedestrian Protection Regulations affecting vehicles from 2020<sup>12</sup>.

The review is being led by the UK's TRL; DfT and many other UK organisations have been involved in the workshops and associated activities. The outcome of this review will shape vehicle safety standards in Europe over the coming decade(s) and it is therefore important that DfT clarifies its acceptance of the revised standards. Assuming that any resulting new EU law is passed before the date of the UK's exit (currently assumed to be March 2019), it should be included as part of the transfer from EU law to UK law covered by the Great Repeal Bill. Understandably, at present these matters lack clarity. DfT will need to take an active role in the forthcoming discussions and negotiations as these important revisions to safety standards are finalised.

If the EU and the UK adopt the proposed amendments to the General and Pedestrian Safety Regulations, this will represent a step change for vehicle safety, significantly reducing the risk of collisions and mitigating many injuries. At present, there is no other practicable action proposed that would prevent road injuries and deaths at this scale. There are 24 measures proposed which cover all

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<sup>12</sup> Status of the review of the General Safety and Pedestrian Safety Regulations, [www.unece.org/fileadmin/DAM/trans/doc/2016/wp29grsp/GRSP-60-21e.pdf](http://www.unece.org/fileadmin/DAM/trans/doc/2016/wp29grsp/GRSP-60-21e.pdf)



vehicle types from passenger cars to large trucks and buses. One measure being considered by the European Commission is aimed at reducing blind spots around HGVs and buses/coaches to improve safety for vulnerable road users, such as pedestrians and cyclists, by introducing direct vision requirements (long-term measure) and cameras and vulnerable road user detection systems (short-term measure). The focus is on direct vision requirements to reduce blind spots, but also includes proposals for cameras and detection systems earlier as a complementary measure. Specifically, the proposal at the time of writing is to make mandatory for mini-buses, buses, coaches and large goods vehicles:

- 01/09/2020 for new approved types – Camera and Detection
- 01/09/2022 for new vehicles – Camera and Detection
- 01/09/2028 for new approved types – Direct Vision
- No new vehicles date foreseen due to impact on overall truck cab designs

These measures apply to all large passenger and goods vehicles irrespective of the changes to the Weights and Dimensions Directive (EU) 2015/719. Early fulfilment of direct vision requirements could be incentivised through permission for extended length. These measures are to be supported. It would be desirable to bring forward the timescales for introduction for new approved vehicle types.

Beyond this next set of revisions, a key question is whether or not all future changes in EU Type Approval will be automatically adopted by the UK to ensure that vehicle safety standards in the UK will remain in line with those of the remaining EU.

#### *UNECE*

Under the UNECE (United Nations Economic Commission for Europe) based in Geneva, the World Forum for Harmonisation of Vehicle Regulations or working party 29 (WP.29), currently chaired by the UK, establishes UN regulations.<sup>13</sup> They include performance oriented test requirements as well as administrative procedures. In the European Union, the General Safety Regulation and Pedestrian Safety Regulations list the UN vehicle safety regulations that apply on a compulsory basis. This is how they are applied as part of the type approval process and the conformity of production requirements. The size of the European Union market makes this an efficient way to apply standards, enable mutual recognition of tested vehicles between member states and achieve cost effective, relevant and robust regulations. Following Brexit, it is important that UK vehicles are at least as safe as those sold in mainland Europe.

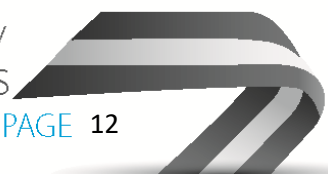
It is acknowledged that many of the technical developments and establishment of functional requirements, test and assessment procedures, etc. will take place in the UNECE arena, where the UK, as a signatory to the 1958 agreement, has a strong and influential leadership position. It is assumed that this situation will remain unchanged, but the detailed decisions about timing, scope and content of future changes in the EU Type Approval requirements will still be held in Brussels, where it is expected that the UK will have a different and less influential role. This future role needs to be clear and strong and associated with a simple process for incorporating future changes into UK law.

#### *International trade agreements*

If, as the Government intends, the UK enters into international trade agreements with non-EU countries, it will be important to ensure that safety standards are not compromised. For example, the USA has different vehicle safety regulations, some of which are inferior to those of the EU, particularly regarding pedestrian protection.

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<sup>13</sup> [https://www.unece.org/trans/main/wp29/meeting\\_docs\\_wp29.html](https://www.unece.org/trans/main/wp29/meeting_docs_wp29.html)



## Longer term actions

### *Future of research*

The continuation of the RAIDS (Road Accident In-Depth Studies) project is very welcome. Understanding the causation of road crashes and their consequences is fundamental to making further progress, as well as being the measure of effectiveness of earlier countermeasures. For decades, the UK had outstanding activities in this area, particularly the CCIS (Cooperative Crash Injury Study and OTS (On The Spot) projects. These projects provided a stable foundation upon which much of the research into countermeasures and test procedures was based. In recent years though, there has been more of a stop-start approach to real world data collection. This has led to a paucity of information about the latest issues and technologies. Whilst the renewal of RAIDS is undoubtedly good news, it is a relatively small project and the limited number of cases investigated will limit its effectiveness. Opportunities to increase its scope and provide long term commitment to its continuation should be investigated.

There have also been recent calls from PACTS and others for the establishment of a Road Collision Investigation Branch.<sup>14</sup> It was reported that the current *'fragmented and silo based approach into collision investigation limits the potential to prevent collisions and injuries on our roads'* and that the establishment of an RCIB *'would generate a powerful dataset and form the empirical foundation for future road casualty reduction'*.

Although real world evidence provides the bedrock, it is only its application in other research which will deliver road safety benefits. Again, for many decades, the UK was one of the leading players, carrying out detailed research leading to numerous safety developments and policies. In previous years, the DfT had a clear programme of prioritised areas of research, carried out by numerous world-leading organisations. At present, some of this focus has been lost (with the exception of Connected & Autonomous Vehicles, see below) and it is now the EU which seems to be prioritising, coordinating and funding research activities and organisations such as Euro NCAP developing test procedures and assessment criteria. It is strongly suggested that DfT renews its focus in all areas of vehicle safety research, ensuring that the appropriate research is carried out to ensure further improvement in the UK's road safety performance and maintaining a strong research base in the UK's universities and research organisations.

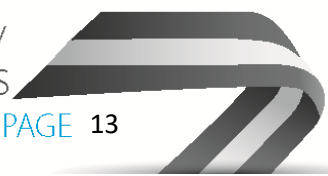
The EU currently funds / coordinates most of Europe's road safety research projects and the UK has been a valued member in many of these. The inclusion of the UK has brought considerable expertise and experience into the arena, as well as the perspective from a member state whose roads are amongst the safest in the world.

The loss of this UK contribution to EU coordinated research programs will be a loss to both the UK and the rest of the EU, as the UK's input may not be included in future considerations and its influence on the research agenda will be diminished. There will also likely be a reduction in funding to UK institutions. There is already anecdotal evidence that UK is already being passively excluded from some research proposals and applications.

It should be noted that a number of non-EU countries are already involved in some projects, so the UK does not need to be automatically excluded. It would however be useful to clarify the UK's future role. The UK should also look to ensuring future funding for on-going vehicle safety research in the UK.

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<sup>14</sup> PACTS Conference: Collision investigation – how can we learn more? 22 March 2017, <http://www.pacts.org.uk/2017/03/pacts-conference-live-updates/>



### *Connected and autonomous vehicles*

The move towards autonomous vehicles and acceptance of the concept have been rapid. In a very short time period, the topic has moved from advanced research in technology companies to being included on future product plans of major vehicle manufacturers.

The work to date suggests that autonomous driving may offer significant safety benefit over the use of fallible human drivers.<sup>15, 16, 17</sup> These benefits will however only be achieved after much more development and, in particular, trials under normal traffic conditions. The mix of autonomous and non-autonomous vehicles in the same traffic flow presents a major challenge. Realistic field trials are essential to understand the issues better and develop robust technological solutions.

It is therefore pleasing to see the UK take such a strong leadership in this field and the positive co-operation it is planning to stimulate is extremely valuable.

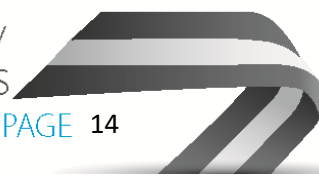
Depending on whose forecasts are most accurate, widespread fully autonomous operation is probably some years away, but it can be assumed some early safety benefit is likely.

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<sup>15</sup> Cuerden R, McCarthy M (2017). The methodology and initial findings for the Road Accident In Depth Studies (RAIDS) Programme: Phase 1 Report. TRL Published Report PPR808

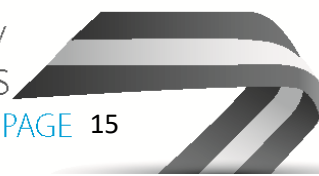
<sup>16</sup> Bertonecello M, Wee D (2015). Ten ways autonomous driving could refine the automotive world. <http://www.mckinsey.com/industries/automotive-and-assembly/our-insights/ten-ways-autonomous-driving-could-redefine-the-automotive-world>

<sup>17</sup> NHTSA. Automated Vehicles. <https://www.nhtsa.gov/technology-innovation/automated-vehicles>



## Appendix A - Review of Specific Proposals for Safer Vehicles in the Road Safety Statement

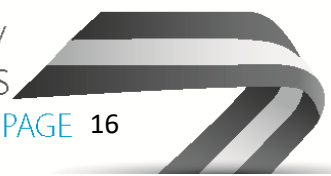
Topic	Specific Proposals	Review Comments
Promoting Safer Vehicles	<b>2.29</b> Explore further options for accelerating consumer demand for safer vehicles.	<p>The safer performance and equipment of new vehicles (particularly cars) has increased significantly. More “benefit” in pipeline as vehicle fleet is renewed and safer vehicles chosen (including for vulnerable road users).</p> <p>Strong relationship with Euro NCAP needs to be maintained post-Brexit.</p> <p>Specific plans and evidence needed for encourage of safer vehicles through public procurement.</p> <p>Implications of Euro NCAP assessment criteria changing over the years needs to be understood, communicated and addressed.</p>
	<b>2.30</b> Increase consumer awareness of the Euro NCAP star rating system to raise appreciation of benefits and affordability of technologies, such as AEB.	
	<b>2.31</b> Encourage safer vehicle procurement, starting with public sector fleets through vehicle purchase, leasing and hiring policies.	
Promoting Safety Equipment	<b>2.32</b> Encourage the uptake of other safety equipment across other road transport modes. Apply SHARP methodology to research the efficacy of innovations such as inflatable rider clothing and sobriety bands.	Not enough information to review <u>vehicle</u> implications.
Research	<b>2.33</b> Improve knowledge of real world collision dynamics with ongoing Road Accident In-Depth Studies (RAIDS).	<p>Renewal of RAIDS is encouraging, but concerns over limited number of cases.</p> <p>Clarification needed over extent and content of other UK research activities (especially outside of EU).</p>
HGV Safety	<b>2.34</b> Focus on reducing deaths, including cyclists, caused by HGVs. Work at EU level on new laws to improve HGV safety (field of view, camera systems, front structures for better pedestrian/cyclist protection). Consult on legislative changes to ensure that sideguards and rear under-run devices remain fitted for vehicle life.	Important work, addressing key priority, but opportunity to influence EU regulation may be affected by Brexit.





Topic	Specific Proposals	Review Comments
Connected & Autonomous Vehicles	<b>2.35</b> Regulatory environment to support safe, legal testing of autonomous vehicles. Commitment for connected and autonomous vehicles to be safe, legal and beneficial for all.	UK leadership and positive co-operation in this area is valuable.
	<b>2.36</b> CCAV is coordinating government activity. Working with vehicle manufacturers, technology/communications companies and others (e.g. insurers), to understand the potential & implications and to remove obstacles to their introduction.	Realistic field trials are essential to understand / develop robust technology.
	<b>2.37</b> Co-funding R&D into connected and autonomous vehicle technology, including 4 city trials to test technology in real-world and provide insights into operation and interaction with other road users.	Most major vehicle manufacturers working on autonomous vehicles.
	<b>2.38</b> Trials to determine effects of HGV platoons.	Widespread <u>fully</u> autonomous operation is some years away, but some early safety benefit likely.
	<b>2.39</b> Consider extent of revision to existing road safety regulations to ensure the full benefits of driverless cars can be reaped.	
Distraction	<b>2.40</b> Reduce the risk of in-car distractions. Take tough approach to technological distraction. Proposed increased penalties (especially for HGVs) for use of hand-held mobile phones. Research the behavioural and human factors in greater depth.	The issue described sounds more road user/ enforcement than vehicle related. The interaction between these aspects needs clarity.
	<b>2.41</b> Keep abreast of complications of evolving multi-functional technologies (e.g. tablets, smart watches).	
Bus & Taxi Operations	<b>2.42</b> Work with bus and taxi operators on appropriate but proportionate legislation and good practice for safe passenger transport.	Not enough information provided to review <u>vehicle</u> implications. What are the perceived issues? To what extent are they <u>vehicle</u> rather than <u>user/behaviour</u> issues?  The inclusion of this item is surprising since the Government has repeatedly rejected a safety amendment to the Bus Services Bill to require bus operators to subscribe to a confidential incident reporting scheme. <sup>18</sup>

<sup>18</sup> <http://www.pacts.org.uk/2017/03/bus-services-bill-passes-through-third-reading-in-the-house-of-commons/>



UK Road Safety  
SEIZING THE  
OPPORTUNITIES



Parliamentary Advisory Council for Transport Safety  
Clutha House, 10 Storey's Gate, Westminster, London SW1P 3AY  
0207 222 7732  
[www.pacts.org.uk](http://www.pacts.org.uk)  
[admin@pacts.org.uk](mailto:admin@pacts.org.uk)  
Twitter: @pacts

