

Title: Pathway to Driverless Cars: Insurance for Automated Vehicles IA No: DFT00366 RPC Reference No: RPC16-3522(1) Lead department or agency: Centre for Connected and Autonomous Vehicles Other departments or agencies: DFT, BEIS	Impact Assessment (IA)			
	Date: 7 th October 2016			
	Stage: Final			
	Source of intervention: Domestic			
	Type of measure: Primary legislation			
	Contact for enquiries: Sevvy Palmer, 0207 944 2912			
Summary: Intervention and Options				RPC Opinion: EANDCB Validated

Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANDCB in 2014 prices)	One-In, Three-Out	Business Impact Target Status
£0.0m	£0.0m	£0.1m	In scope	Qualifying provision

What is the problem under consideration? Why is government intervention necessary?
 Automated vehicles (AVs) will allow the driver to disengage from the driving task, handing full control and responsibility to the vehicle when the automated systems are active, without needing to intervene or monitor. This creates an issue for motor vehicle insurance. UK law requires the driver to be insured, so when the driver uses automated mode, gaps would emerge in the insurance framework, making it difficult and time consuming for victims to claim compensation. Third parties might not be covered without the proposed intervention, which is a market failure. With such vehicles expected to be on the road in 5 to 10 years, Government intervention is required to resolve this issue, to provide clarity to motorists and industry.

What are the policy objectives and the intended effects?
 The objective is to ensure that the use of automated vehicles (AVs) is insured, so that the innocent victim of a collision involving an automated vehicle receives compensation quickly in line with long standing practice in UK insurance and in compliance with the EU Motor Insurance Directive. In doing so, we will also help maintain the UK's leading approach to the development and commercialisation of Connected and Automated Vehicle (CAV) technologies, contribute towards enabling their sale and use in the UK, and realise the benefits they are expected to bring to safety, mobility, productivity and smoother journeys.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)
 Option 1: Do nothing. This could result in AVs not being insured in some situations and could cause delays for innocent victims in claiming compensation.
 Option 2 (preferred): Extend compulsory motor vehicle insurance (Part 6 of the Road Traffic Act 1988) to include the use of AVs, and establish a 'single insurer' model, where an insurer covers both the driver and the AV technology, without prescribing how this will work in practice.
 Option 3: First party liability model where the victim claims from the insurers of the vehicle they are travelling in, or the vehicle involved in the collision (if the victim is not in a vehicle themselves), regardless of liability. While Option 2 and 3 would both achieve the policy objectives, it is considered that Option 3 would be too disruptive and costly at this stage, impacting on all motorists not just those using AVs.

Will the policy be reviewed? It will be reviewed. If applicable, set review date: 12/2020				
Does implementation go beyond minimum EU requirements?			No	
Are any of these organisations in scope?			Micro Yes	Small Yes
			Medium Yes	Large Yes
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)			Traded: NA	Non-traded: NA

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.

Signed by the responsible SELECT SIGNATORY : _____ **Date:** _____

Summary: Analysis & Evidence

Policy Option 2

Description: Make minimum changes to Road Traffic Act 1988 to enable the market to develop appropriate insurance products for vehicles with Automated Vehicle Technology (AVT).

FULL ECONOMIC ASSESSMENT

Price Base Year 2016	PV Base Year 2016	Time Period Years 5	Net Benefit (Present Value (PV)) (£m)		
			Low:	High:	Best Estimate: -0.08

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0		
High			
Best Estimate		0.1	NQ

Description and scale of key monetised costs by 'main affected groups'

Direct costs to insurance industry: Familiarisation costs; we expect a regulatory compliance manager will need to spend time understanding the implications of the change and establishing whether to offer products for AVs. As the preferred option has been developed with the insurance industry, we expect this to be small (at most half a day or 4 hours for a regulatory compliance manager in each affected business). Any further costs would be indirect and based on the commercial case for insurers to offer products for AVs.

Other key non-monetised costs by 'main affected groups'

Potential indirect costs to insurers include training and organisational changes that may be required to offer AV insurance products. However, it is assumed that insurers will only do so if the benefits outweigh the costs as it will not be compulsory to offer such products. These costs may occur even if we did not update the regulatory regime. We do not foresee any new costs for vehicle manufacturers as they are already subject to common law and product liability. These elements are therefore excluded from the EANCB.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	NQ	NQ
High		NQ	NQ
Best Estimate		NQ	NQ

Description and scale of key monetised benefits by 'main affected groups'

Due to limitations of the available evidence base, it has not been possible to quantify the potential benefits.

Other key non-monetised benefits by 'main affected groups'

Benefits associated with the proposed intervention: avoidance of the issues identified in the baseline of gaps in insurance and delays to compensation; promoting inward investment by maintaining the UK as a leading destination for the development and commercialisation of CAV technologies.
Benefits associated with AVs (additional regulatory measures required): improved road safety and mobility; potential benefits from productive use of in-vehicle time by drivers.

Key assumptions/sensitivities/risks

Discount rate (%) 3.5%

Further assumptions and risks are set out in the Risks and Assumptions section of this Impact Assessment.

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: 0.0	Benefits: 0.0	Net: 0.0	
			-0.08

Summary: Analysis & Evidence

Policy Option 3

Description: Introduce a first-party liability model where victims claim directly from the insurers of the insured vehicle they are travelling in, regardless of liability.

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	High: Optional	Best Estimate:

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	NQ	NQ	NQ
High	NQ	NQ	NQ
Best Estimate	NQ	NQ	NQ

Description and scale of key monetised costs by 'main affected groups'

Direct costs to the insurance industry: This option would effectively mandate a full replacement of the existing motor insurance model with the new first-party liability one and extend to all motor vehicles not just AVs. This would include costs for developing new products, 'back-office' systems (eg computer systems), training, etc. In the short term, costs may/would increase for consumers as insurers seek to recoup transition costs. It is not possible to quantify the costs, but they could potentially be significant.

Other key non-monetised costs by 'main affected groups'

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	NQ	NQ	NQ
High	NQ	NQ	NQ
Best Estimate	NQ	NQ	NQ

Description and scale of key monetised benefits by 'main affected groups'

Benefits would match those set out in Option 2 and go further by covering conventional motor vehicles, when it is not necessary and disproportionate to do so. Insurers would have to compensate in all circumstances, including driver error, and then seek recovery from the liable insurer, which could result in increased costs for the liable insurer due to an inability to control costs early on in the claim.

Other key non-monetised benefits by 'main affected groups'

In addition to the benefits from the introduction of CAV technology, in the long term, a first party insurance model may be simpler and easier to operate when we envisage far fewer collisions, and could lead to reductions in consumer costs. It is possible that this model may eventually be appropriate, when there are a significant proportion of AVs in the fleet, but this is something that we will consider in a future wave of the regulatory programme.

Key assumptions/sensitivities/risks	Discount rate (%)	NA
--	--------------------------	-----------

We assume that in the baseline AVs will start to reach the market in 2021 at the earliest. Vehicle manufacturers have an incentive to recoup their development costs by selling AVs in the UK, and will be able to do so if they can secure Vehicle Type Approval. Without Government intervention, gaps in insurance may arise as per the problems identified in this Impact Assessment, leading to, in effect, public services covering these gaps.

BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:	Score for Business Impact Target (qualifying provisions only) £m:	
Costs: NQ	Benefits: NQ	Net: NQ
		NQ

Evidence Base

1. Problem under consideration

Automated Vehicle (AV) technologies will be a further development of Advanced Driver Assistance Systems (ADAS). Unlike ADAS, where the driver must monitor and remain ready to take control from the vehicle at all times, it is envisaged that in an AV, the driver will be able to disengage from the driving task, handing full control and responsibility to the vehicle when the Automated Driving Function (ADF) is active, without the need to intervene or monitor, for some, or all, of the journey. Whilst the ADF is active, the driver would in effect be a passenger.

Unlike in many other countries, the UK motor vehicle insurance model is based on insuring the driver of the vehicle, rather than the vehicle itself. This approach has worked well for conventional vehicles (including vehicles with ADAS). In an AV, however, as the driver can be out of the loop, the approach begins to break down. We wish to make sure that the use of motor vehicles continues to be insured when AVs reach the market, which we expect in 5-10 years. We have identified three pressing issues with respect to insuring AVs that need to be addressed:

1) No clear route to compensation, leading to delays in compensating innocent victims

UK law on compulsory motor insurance has focused historically on compensating victims of road traffic collisions quickly and fairly. Further, EU Directive 2009/103/EC (the Motor Insurance Directive) requires such victims to be compensated quickly. In the event of a collision involving one or more AVs, the 'user' of the vehicle could claim that they were not responsible – as they had handed control to the AV – and, in effect, force the innocent victim to seek recourse from the manufacturer.

Determining liability could prove to be complex as the fault could rest with the driver or the vehicle, depending on, for example, whether or not the ADF was active at the time of the collision. Fault could also rest with the road operator¹, or with another road user.

In the absence of an insurance policy that provides adequate protection, the innocent victim of a collision may have to take the manufacturer of the vehicle and/or other parties to court in order to secure compensation.

Waiting for liability to be resolved before the manufacturer pays compensation perhaps after a court ruling (which could be time consuming), as well as the lack of a clear compensation route, could result in significant and/or unacceptable delays to compensation to innocent victims of collisions involving AVs. This would run counter to longstanding UK tradition which predates the matching requirements of the EU motor insurance directive².

2) Protecting innocent third parties involved in collisions involving AVs

Current compulsory insurance cover arrangements in GB relates only to insurance for collisions caused by driver negligence – not product liability. While the ADF is active, it is unlikely that the driver would be deemed to be liable in the event of their vehicle being involved in a collision.

¹ The road operator - such as Highways England for the English motorway network, or a local authority for a local road

² On 23 June, the EU referendum took place and the people of the United Kingdom voted to leave the European Union. Until exit negotiations are concluded, the UK remains a full member of the European Union and all the rights and obligations of EU membership remain in force. During this period the Government will continue to negotiate, implement and apply EU legislation. The outcome of these negotiations will determine what arrangements apply in relation to EU legislation in future once the UK has left the EU.

Consequently, current compulsory insurance provisions would not protect innocent third party victims of collisions involving AVs.

Compulsory insurance requirements would need to be extended to cover collisions resulting from vehicle and/or software malfunction or failure. This would give a victim of a collision the same level of protection if involved in a collision with an AV, as they would have if they were involved in a collision with a conventional vehicle.

3) Innocent drivers of AVs involved in collisions where the AV is at fault

The current insurance system does not protect the vehicle's driver in the event of vehicle and/or software malfunction or failure. Currently, this is unlikely to occur with conventional vehicles, as evidence suggests that over 90% of all collisions involve an element of human error. In an AV, motorists would not be covered by their motor vehicle insurance policy whilst the ADF was active.

For example, in the event of a collision involving one or more AVs, the insurer should not be required to provide cover to compensate the driver if the driver was in control at the time (the ADF was inactive). However, if the ADF was active at the time of the collision, and failed as a result of vehicle and/or software malfunction or failure, then the driver should be protected by their insurance policy. However, specific exemptions may exist if the user and/owner has modified their vehicle or failed to update it.

2. Rationale for intervention

Under our current type approval arrangements, AVs could be sold in the UK and potentially used without appropriate insurance, which could result in the manifestation of the issues identified in Section 1 of this Impact Assessment. The rationale for intervention is to avoid these issues, and provide clarity to consumers and manufacturers of AVs around the insurance requirements that will be applicable when such vehicles become available, so as to reassure them that they would be properly insured.

The issues identified could also be avoided by introducing specific regulatory measures to prevent the sale of AVs, even if they have been type approved. However, this option is not under consideration as Government policy is to support the introduction of new vehicle technologies that have the potential to yield significant benefits. To prevent their sale and use would forego these benefits and put the UK at a disadvantage internationally.

These insurance issues will need to be accommodated in the legislative framework so that insurance products are readily available when AVs start to become available. The joint consultation response from the Association of British Insurers (ABI) and Thatcham Research supports this view: "*The clarity provided by legislating several years before products will be available could allow insurers to invest with greater confidence*". This provides a clear rationale for intervening at this stage, giving clarity and direction and allowing the market time to develop suitable insurance products ready for when AVs start to become available.

3. Policy objective

The primary policy objective is to ensure that the use of motor vehicles continues to be properly insured so that innocent victims are compensated quickly in the event of a collision involving AVs.

The intended effect of the proposed intervention is that AV users, and other road users, are appropriately covered by insurance and are swiftly compensated in the event of a collision involving one or more AVs.

Secondary policy objectives include contributing towards:

- Creating a regulatory environment that permits the safe and legal use of AVs in the UK; and
- Maintaining the UK's leading approach to the development and commercialisation of Connected and Automated Vehicle (CAV) technologies.

It is important to note that the proposed changes in this Impact Assessment will not, on their own, enable the sale and use of AVs in the UK. Internationally, the United Nations vehicle regulations that underpin the European Whole Vehicle Type Approval would need to be amended first, and then vehicles would need to be tested against these new standards. Domestically, other changes to legislation (eg the Road Vehicle Construction and Use regulations), and guidance (the Highway Code) will be required to enable people to take advantage of the automated features, and for manufacturers to market AVs in the UK.

The policy objective is not to compel AVs to be sold, purchased, or used, nor to compel insurance companies to offer insurance products for them, nor prescribe the form that such insurance products should take. The proposed intervention is not designed to achieve such objectives, rather it enables appropriate insurance products to be sold. The rationale is to achieve the policy objectives with the simplest possible solution with the minimum intervention, thus keeping the new insurance model as close as possible to the current one - an approach consultation responses have largely supported.

4. Options under consideration

General approach

Our overall approach to domestic regulation for the introduction of ADAS and AVT is to take forward changes on a rolling basis. Our recent consultation showed broad support for both amending our regulatory framework for motoring to enable the sale and use of AVs, and the use of a rolling programme. Each wave of our rolling programme will:

- Prepare for the future; where we can identify issues that require intervention we aim to address them in good time to allow the market to develop solutions; and
- Respond to the market; making changes to the overall regulatory framework to enable people and businesses to take advantage of technology as soon as it comes to the market (ie technologies that are due to reach commercial viability within a 2 to 4 year time horizon³)

The proposed changes to the insurance system that are the subject of this Impact Assessment form part of the first wave of the regulatory programme. We propose to make preparatory changes to facilitate the development of appropriate insurance products for AVs in anticipation of their commercial availability, so as to avoid the issues identified above. We have been engaging with the insurance industry over the past year to ensure we make minimal and

³ This timeframe is based on ongoing discussions within the United Nations Economic Commission for Europe's Working Party 29 – the World Forum for the Harmonisation of Vehicle Regulations – which is undertaking revisions to UN regulation 79 focusing on automatically commanded steering functions. This set of revisions is looking at ADAS rather than automated driving functions.

proportionate changes to the current regulatory framework, which has the benefit of both being familiar to the motorist and achievable for the insurance industry to deliver.

The other enabling changes required for legislation and/or guidance will be made in future waves of the regulatory programme.

The approach we propose aims to cater for the small number of vehicles that will initially be available. The experience and evidence this provides will contribute to the evidence base and enable better-informed longer-term changes to the insurance regulatory framework to then be made, if they are needed. We anticipate that future waves of our regulatory programme will provide an opportunity to review and refine our regulatory approach based on how the market responds. In that sense these proposals are time-limited and we will continue to keep this under review. For this reason the appraisal period chosen for this Impact Assessment is 5 years.

We propose a light-touch approach to regulating the insurance framework for AVs, by specifying only the minimum levels of insurance coverage that must be in place, rather than mandating any particular models for those insurance products or creating any new detailed procedures for how manufacturers and insurers must co-operate when handling claims relating to AVs. We anticipate that insurers and manufacturers will work together to reach commercial arrangements that will help ensure that the insurer's recovery of the claim when determining technical liability are handled quickly and fairly.

If the market fails to develop appropriate arrangements for ensuring that claims are dealt with reasonably quickly, we may need to return to the issue and regulate the insurance models and/or claims handling procedures in a more prescriptive manner, but, in line with better regulation principles, we first want to give the market a chance to respond.

The aim of the initial changes will be to ensure that any victim of a collision with an AV will have the same protection through insurance cover as one injured in a collision with a conventional vehicle and will, as far as possible, be compensated on similar timescales.

In the future we may need to legislate on other issues such as minimum data sharing requirements and standardisation of data captured in road traffic collisions involving AVs to help in determining liability. However, we believe it is currently too early to make such decisions, and those considerations are separate from the ones under consideration in this Impact Assessment.

Aspects common to all options

Underwriting:

Subrogation means to recover the costs of a claim. It is important to note that under any of the options outlined in this Impact Assessment, if an insurer offers a policy that covers AVs, the risk that the insurer is underwriting is not the cost of all AV-related claims, merely the risk that they are unable to subrogate those claims. Potential routes to subrogation include claims against the manufacturer for product liability, for example in the event that a technical failure of an AV is a contributory factor in a collision.

We are not proposing to make any changes to the existing product liability framework in any of the options under consideration.

Option 1 - Do nothing

We believe that the baseline scenario is that both established and new vehicle manufacturers, who are currently investing heavily in AV technology, will bring AVs to market in 5-10 years⁴. This is more likely to be focused on technology that enables highly automated driving in specific use cases (eg on motorways and other segregated high speed roads), rather than 'fully automated' operation in the first instance.

Our type approval system (European Whole Vehicle Type Approval) is based on international vehicle standards set by the World Forum for the Harmonisation of Vehicle Standards (also known as UN regulations). Once type approved against these UN regulations and other (environmental) standards, a vehicle could be sold anywhere in the UK and the European Union. While current revisions to the relevant regulation is focused on ADAS, we believe it is likely that UN regulations for AVs will be successfully developed. This would enable manufacturers to secure type approval in, or outside of, the UK, and thus sell AVs in the UK, unless we take regulatory measures to prevent this.

Therefore, if we do nothing, it is possible that the issues identified in Section 1 of this Impact Assessment will materialise, including the possibility that "gaps" in the insurance system would appear for AVs. For example; where an innocent driver is unable to claim for compensation in situations where genuine defects in an AV causes a collision without pursuing a product liability claim directly against the manufacturer. Although some manufacturers have stated that they will "stand behind" their products, providing cover in the event of product failure, not all have and it is not clear that there will be simple and easy routes to recovery for innocent parties. The potential effect of this would be that more costs of collisions or injuries would fall on the public purse via the NHS and social security systems where a person is unable to gain compensation for medical or social care or loss of earnings, and instead has to use the NHS or local authority funded care, and could be more reliant on the benefits system. The innocent victim could also be forced to wait a significant time period while pursuing the manufacturer through the courts. It is unlikely that innocent third parties would have recourse to legal aid in such cases.

The measures set out in this Impact Assessment are an important part of establishing an appropriate regulatory framework for AVs, to enable their safe and legal use in the UK. Although the measures set out in this Impact Assessment are not likely to materially impact the timescales or likelihood of the commercial availability of AVs, ensuring there is an appropriate insurance framework and insurance products ready, will support the full realisation of their potential benefits as soon as possible. The potential benefits of AVs are set out in the Wider Impacts section of this Impact Assessment.

Option 2 - Preferred option

Option 2 is to make the minimum legislative changes required to enable the market to develop appropriate AV insurance products. This includes extension of compulsory motor vehicle insurance to cover the use of AVs, with a majority of answers (385 out of 482⁵ favour adapting our insurance framework to support AV use is intended to is intended to is intended to

⁴ This timeframe is based on manufacturers publically stated plans; at least two major vehicle makers have stated that they intend to offer ADF for Motorway Pilot (as distinct from ADAS Motorway Assist) in 2021. We expect that this is the earliest that such functionalities could be type approved for sale in the UK and the EU.

⁵ Number of answers that agreed with the question "Do you agree with the proposition to amend road vehicle compulsory insurance primary legislation in part 6 of the Road Traffic Act 1988 to include product liability for automated vehicles?". A total of 410 responses were received to the consultation "Pathway to driverless cars: proposals to support advanced driver assistance systems and automated vehicle technologies". Many responders provided multiple answers to individual questions, or did not an answer at all, therefore the number of answers will not match the number of responses.

- Ensure that the use of motor vehicles continues to be insured and thus avoid the issues outlined above from materialising; and
- Gather experience of the small number of vehicles that will be available initially and to use the evidence this will generate, to review and take further regulatory measures if necessary.

Part 6 of the Road Traffic Act 1988, and in particular section 145, requires a policy to insure the person in respect of any liability, which may be incurred by them arising out of the use of the vehicle on a road. For conventional driving and for vehicles with ADAS, this protects the victim of a collision and is consistent with the compulsory insurance requirements of the Motor Insurance Directive. This is a view shared, in consultation responses, by the insurance industry – for example, the joint Association of British Insurers (ABI) and Thatcham Research response clearly states that *“The adoption of any changes to the compulsory insurance requirements that are proposed as a result of this consultation exercise should apply only to the cars with full (automated driving technology) capability (available from 2021 onwards)”*. Ageas Ltd believed that *“it would be better to maintain the existing regime, dealing with any claims that involve a failure in vehicles with Assisted driving systems in exactly the same way that we would today if there were a failure, for example, a car’s braking system”*.

Our proposed changes to the Road Traffic Act will establish a single insurer model which covers the driver when they are driving, and when they have activated the ADF. The user and/or keeper of the vehicle (as appropriate) would need to make sure a suitable insurance policy was in place, and in the event of a collision while the ADF was active, the innocent victim (both inside and/or outside the vehicle) would be able to claim from that insurer.

When a crash is determined to have been caused by an AV, where the ADF was active, the insurer will always pay out to the innocent third party victim. And, they would pay out to the motorist in the vehicle if the ADF was active, except if the motorist had made unauthorised modification to their AV, or if they had failed to install required updates to the software which in either case had resulted in the AV causing the crash. In addition, insurers would not be able to exclude payment of compensation in the event of the AV, with ADF active, causing the crash as result of it being hacked.

Where the manufacturer is found to be liable, the insurer will be able to pursue a subrogated claim against the manufacturer under existing common law and product liability arrangements and recover their costs from the manufacturer. It is possible that the first few cases will go to court though over time we expect insurers and manufacturers will develop processes to handle subrogated claims quickly and easily. And, in any case, we do not consider it to be in a manufacturer’s commercial interest to be unhelpful to insurers in determining liability or paying subrogated claims; ultimately insurers could potentially cease offering insurance products for their vehicles if their route to recovery was consistently blocked.

It is important to note that the right to subrogate claims is not universal, and in effect the insurers would only need to cover the cost of the claims that they would not be able to subrogate (eg if the manufacturer were to be able to successfully use the ‘state of the art’ defence under a product liability claim).

In addition, we will make consequential changes to enable the system to function. For example, we propose giving the Secretary of State the power to publish a list that will classify the vehicles or types of vehicles that are AVs, and are therefore subject to the new insurance requirement. Potential costs to the public sector of updating the DVLA database are set out in the Costs section of this Impact Assessment. Potential costs associated with publishing the list, including any potential costs to businesses, will be considered as part of a separate Impact Assessment when the list is proposed.

Self-insurance:

We are allowing the crown and public sector to continue to self-insure. Where they choose to use AVs, in the event of a collision they must pay compensation even if the ADF was active, and can recover costs, for example from the manufacturer, as appropriate.

Option 3

Option 3 involves the introduction of a first party liability model where victims would claim directly from the insurers of the insured vehicle they are travelling in, regardless of liability. This would meet the EU Motor Insurance Directive mentioned in Section 1 of this Impact Assessment. For the UK insurance market, compensation would still be paid quickly, though liability would still need to be determined and the 'at fault' party would eventually meet the cost of the claim.

This option is rejected because it would require a complete overhaul of current insurance practice, which would apply to all vehicles, not just AVs, and could lead to higher premiums as:

- It would be difficult for insurers to cost risk until they learn from experience; the insurer who is most likely to meet the claim would also want to control costs early on and if this proves to be more complex, it could also result in higher premiums if they were not able to; and
- Insurers may seek to pass the costs of putting in place new insurance products, training, 'back office' systems, etc. to the consumer

This measure would not be proportionate to the small number of AVs that are likely to be marketed in the coming years. In addition, we do not know whether determining liability will take longer in reality as we have no experience of consumers using AVs in a real world scenario. However, this model may be more appropriate when the vast majority of the fleet is fully automated, when it is envisaged there will be far fewer collisions. Approximately 1/3rd of answers to the consultation supported this view, with a further 1/3rd not expressing an opinion⁶. The Society of Motor Manufacturers and Traders (SMMT) thought that this model would be likely to increase costs and work counter to the process of correctly directing costs in line with faults. ABI/Thatcham also believed that a first party model was not proportionate or desirable at this stage, and that more evidence (eg claims experience) was needed to understand the impacts of introducing a first party model.

5. Monetised and non-monetised costs and benefits of each option

Approach

The evidence of the benefits and costs associated with the proposed intervention is very limited. Our initial assessment of the potential sources of costs and their order of magnitude was that the direct costs would be small, and so a Regulatory Triage Assessment approach at consultation stage was adopted, with a view to securing any additional evidence through the consultation. Consultation responses provided us with some further information but insufficient

⁶ A total of 415 answers were received to the consultation question "Do you agree that an alternative first party model option would not be proportionate while automated vehicles represent a small proportion of the fleet?". 134 answers agreed, 141 were blank, and the remainder disagreed.

evidence to quantify impacts. Estimates for the EANCB are nevertheless informed by consultation responses.

Summary

We believe that the direct costs to industry as a result of these proposals against the baseline, will be small and mainly limited to familiarisation costs, for which we have made an estimate for the purposes of the EANDCB. This is supported by consultation responses: *“It is arguable that the costs incurred as a direct consequence of this proposal would be comparatively limited”*(extract from the ABI/Thatcham joint response)

There is insufficient evidence to quantify the indirect costs or benefits in this Impact Assessment, but we believe that the indirect costs will only be incurred by industry if commercial benefits outweigh them. They are therefore excluded from the EANDCB.

Option 1 (do nothing / baseline)

In the baseline, it is possible that the market would develop insurance products for AVs. Some vehicle manufacturers have publicly-stated commitments to assume liability for AVs they plan to bring to market. At least one UK-based insurer has announced plans to offer such insurance products. However, there is no guarantee that this would be applied universally or consistently, enable compensation to be claimed easily, ensure payments would be made fairly and quickly, or avoid gaps in insurance. We believe it is likely that the issues identified in section 1 of this Impact Assessment would materialise to at least some extent in the baseline.

It is reasonable to assume that the indirect costs identified against options 2 and 3 could also materialise in the baseline, as some insurers and manufacturers might offer insurance products along the lines of what would be required under those options. As mentioned earlier in this Impact Assessment, this is because there is a global market for AVs and manufacturers will have an incentive to sell them in the UK, and are therefore likely to do so unless regulatory measures are implemented to prevent this. At the same time, insurance companies are likely to adapt to the arrival of AVs in the baseline.

Option 2

Costs by main affected groups:

Insurance industry:

Direct costs:

Familiarisation costs – insurance firms will need to familiarise themselves with the changes. However, this cost would be small, as we are making a small set of changes to insurance law and only consequential changes elsewhere. In addition, we have been working closely with the insurance industry, and we expect that they will be fully familiar with the changes by the time they take effect. An indicative estimate of potential familiarisation costs is included in the EANDCB, as set out in the ‘Direct costs and benefits to business following BIT methodology’ section of this Impact Assessment.

Indirect Costs:

Responses to the consultation indicated a range of possible indirect costs. As mentioned above, it is feasible that these would also be incurred in the baseline should insurers opt to develop insurance products for AVs.

Organisational design – including updating IT systems, staff development, training etc. For example, it will be necessary for insurers to determine whether a vehicle is an AV, in order to determine whether the insurance policy should cover situations where the driver is not liable. In order to do this, it is proposed that the DVLA database and Motor Insurance Database (MID) would be updated to include a field that indicates vehicles that have ADF. The costs of this are outlined in the Costs section of this Impact Assessment. IT systems would need to be updated to process this information. However, we believe this will be necessary regardless of the proposed intervention and would be likely to occur in the baseline. In the event that insurers did not have a means of determining whether a vehicle is an AV via the MID, they would either rely on an alternative and potentially costlier means, or, if they did not find a means of doing so, they could face an uncertain level of risk in underwriting such policies.

Changes to insurance processes – consultation responses mentioned the differences in claims management processes, supply chain costs, changes that would need to be made to insurance policies and data access requirements. These aspects would all potentially constitute indirect costs, however there is insufficient evidence to quantify these impacts. Any such costs would likely be incorporated into the price of the AV insurance policy.

The costs of meeting claims – some consultation responses mentioned the fact that processing and meeting the costs of claims involving AVs could be higher. This is potentially particularly relevant in the early years, until precedents and processes have been established.

Set up and operational costs - those associated with developing, marketing, and fulfilling the new insurance products.

It is important to acknowledge that will incur the cost of updating IT systems, staff training and other operational costs only if the benefits of doing so outweighs the costs.

Vehicle manufacturers:

Product liability costs - manufacturers are already bound by the Consumer Protection Act 1987 with respect to product liability. And, there is no obligation on manufacturers to develop and sell AVs. They will only do so if they consider that they can generate a return on their investment in developing the technology, and this would include the costs of meeting any product liability claim. We are not currently proposing to change how product liability works, so we anticipate little or no costs.

The obligation to ensure adequate insurance cover is in place falls on the registered keeper, not on the vehicle manufacturer, so no additional insurance costs should arise directly as a result of this policy. Some manufacturers may, for example, decide to self-purchase an insurance policy to cover the product liability insurance requirements for the cars they sell in the UK as part of their offer to consumers, while others may leave it all to the driver's insurance. Given that the proposed intervention does not prescribe how best to deliver the new requirements, it is impossible to say what the costs on any party would be.

Direct

No direct costs to businesses have been identified.

Should the proposed intervention impact on the costs of insurance for conventional vehicles, this would be a direct cost, as businesses would not be able to avoid it. However, evidence gathered in the consultation and set out below leads us to believe this will not be the case.

A possible outcome that could lead to upward pressure on insurance costs for conventional vehicles could be if AVs had a significant detrimental impact on overall collision rates, if the cost of settling claims increased significantly, or the overall costs faced by the insurance industry increased somehow as a result of the proposed intervention. However, evidence⁷ suggests that AVs will be not only safer for their occupants, but safer for other road users as well, because they avoid dangerous situations and mitigate poor driving behaviour of human drivers. See the Wider Impacts section of this Impact Assessment for further details of the potential safety benefits. In addition, there will initially be only a small number of such vehicles on the roads, so the likelihood that they would have a material impact on overall industry costs is very low in the short term. Furthermore, the data they provide could enable insurers to price risk much more accurately than for conventional vehicles.

It was suggested in some consultation responses that the cost of conventional vehicle insurance policies that offer 'Drive Other Cars' (DOC) cover could increase, as consumers could potentially drive AVs in addition to conventional vehicles and the insurer would be compelled to cover the ADF in this situation. However, we believe that this scenario is unlikely to materially increase costs for conventional vehicle insurance for the following reasons: DOC policies already provide for the policy holder to drive a wide range of vehicle types other than their own. AVs are likely to, over time, have a lower and more predictable risk profile than the range of risks covered by DOC policies generally. Furthermore, the likelihood that a DOC policyholder will drive an AV will be low because the numbers of AVs will be low initially. Finally, the proposed changes do not mandate that DOC policies continue to be offered or that they must cover AVs, so it is possible that to avoid increasing premiums insurers will simply cease to offer DOC policies if they are going to be significantly more expensive as a result of AVs, or qualify that DOC cover does not extend to AVs. However this will happen regardless of the government intervention proposed. Therefore, based on the arguments set out above, we believe that it is unlikely that there will be an impact on premiums for conventional vehicles via DOC as a direct result of the proposed intervention.

The decision for a business to buy an automated vehicle is a commercial one. These proposals do not compel businesses to operate AVs. In the event that a business chooses to operate an AV, they will need to make sure that appropriate insurance is in place. Because of the consequential changes we are making, when the registered keeper applies for an insurance policy, the requirement for this 'new' AV insurance will show up automatically. Therefore, there is little or no need for individual businesses buying/operating AVs to familiarise themselves with this set of legislative changes.

SAMBA

These measures facilitate and enable small and medium sized businesses, primarily insurance brokers, to offer these products as part of their range of insurance policies. Familiarisation costs are the same as for other insurers, and are included in the BIT calculations, but these are the only direct costs. When the registered keeper seeks to purchase insurance for an AV, either

⁷ as set out in the Wider Impacts section of this Impact Assessment

directly from an insurer, or through a broker, changes to the DVLA and MID Databases should automatically flag up whether the vehicle is capable of being used in an automated mode and whether they will therefore need to obtain the new AV insurance.

Indirect

Potential sources of indirect costs might include the cost of insurance for AVs

It is uncertain whether the cost of insuring an AV under the proposed intervention would be higher than for conventional vehicles, or than under the Do Nothing option. Consultation responses indicated that whilst there were positive and negative factors in this area, it is too early to say with any degree of confidence. Most suggested that they expected insurance costs for AVs to reduce over time due to the improvements they are expected to bring to safety, ultimately leading to cheaper insurance for AVs. However, in direct conversations with insurers, it was highlighted that information about potential pricing models for AV insurance products would be commercially sensitive information and would not be disclosed.

The decision to purchase AVs will be a commercial one and is not affected by the proposed intervention. In the absence of these proposals, it is not possible to know whether the cost of insurance for AVs would be higher or lower, should they be brought to market and enabled for safe and legal use by other regulatory measures. If the gaps in insurance identified earlier in this Impact Assessment arose, it could be that some insurers would be able to offer lower premiums than under the proposed option. However, the costs would not disappear, they would merely be shifted from insurers to the public sector, which could be called upon to cover these gaps. This could include hospital costs, social security etc.

Costs to the public sector:

As mentioned above, the DVLA database may need to be updated in order to accommodate additional information denoting vehicles that have ADF. Consequent changes to the MID would also be necessary. The police provide Continual Insurance Enforcement of vehicles. This is to make sure they have insurance, and that it is the correct insurance (e.g. not using a vehicle for business purposes when the policy is only for social and domestic use).

Costs to the public sector include enforcement by the police, who will need to check that AVs have the appropriate insurance. However, and it will be necessary for the Police to continue to enforce existing laws on AVs even in the baseline, and the consequential changes we are making will enable this.

It is estimated that the cost of amending the DVLA database could be £700k if the work was timed with other amendments (which is possible given the timescales). This is based on investigations carried out previously into other potential amendments to the database to cover other policies including for those for ultra-low emission vehicles.

Further costs to the public sector, excluding enforcement (which is covered above), come from the requirement to self-insure AVs, including when the ADF is active. However, it is important to note that public sector bodies will continue to be able to self-insure under the proposed intervention. It is not possible to quantify this impact.

Benefits

Simplicity: Stakeholders wanted to keep systems as simple as possible and avoid a situation where consumers would have to purchase and maintain multiple insurance policies for their

vehicles – an approach that might also carry greater enforcement costs. Under the proposed intervention, consumers will benefit from the simplicity of the single insurer model, which is virtually the same as the current model from the consumer’s perspective, and will not require familiarisation on the part of consumers or businesses.

Consumer confidence: Consumers will be able to purchase AVs confident that they will be insured in the event of a collision when the ADF is activated. Conventional vehicle users and vulnerable road users will be reassured that AVs will not pose an uninsured threat to them and they would not need to pursue manufacturers through the courts in the event of a collision.

Avoidance of the issues identified earlier in this Impact Assessment: Innocent victims of collisions involving AVs will be compensated quickly and fairly, using a familiar claim system and all insurers will cover all claims when the ADF is activated, except under clearly defined circumstances. Anyone involved in a collision caused by an AV with the ADF active will be covered even if the vehicle had been hacked, and the innocent third party victim of a collision involving an AV that had an undeclared modification by its owner would also be covered. In the baseline, these things may not be achieved.

Option 3

Benefits would match those set out in Option 1 and go further by covering conventional motor vehicles. The case for doing so does not exist, as the insurance system for conventional vehicles and those with ADAS, provides appropriate cover and access to compensation, so this would appear to be disproportionate. Insurers would have to compensate in all circumstances, including driver error, and then seek recovery from the liable insurer, which could result in increased costs for the liable insurer due to an inability to control costs early on in the claim.

In addition to the benefits from the introduction of CAV technology, in the long term, a first party insurance model may be simpler and easier to operate when we envisage far fewer collisions, and could lead to reductions in consumer costs. It is possible that this model may eventually be appropriate, when there are a significant proportion of AVs in the fleet, but this is something that we will consider in a future wave of the regulatory programme.

6. Rationale and evidence that justify the level of analysis used in the IA (proportionality approach);

The approach taken to analysis and evidence in this Impact Assessment is proportionate given the limited direct impacts of the policy and the limitations of the available evidence base. Furthermore, steps have been taken in addition to ongoing measures to develop the evidence base around the potential impacts of the technology and the proposed intervention. The policy will affect a very small percentage of the market in the early years and the evidence this generates will be used to inform future waves of the regulatory programme.

7. Risks and assumptions;

In order to realise the benefits of the proposed intervention, AVs would need to secure type approval. In the unlikely event that no AVs reach the market in the next 5 to 10 years, the proposed intervention will yield no benefits. However, the sunk costs are very small. We believe based on our intelligence and the responses to the consultation that vehicles with this

technology will indeed be developed successfully, and the uncertainty is around when, not if, vehicles with this functionality will reach the market.

In terms of the potential benefits of the technology, we believe it is reasonable to assume that AVs will yield significant benefits if they are to be a commercial success. Firstly, it is reasonable to assume that the technology will undergo rigorous testing before being made commercially available. It will also need to present a significant improvement to the user, particularly in the context of safety, in order to justify their likely increased cost versus a conventional vehicle. Should AV technology fail to meet such expectations, consumers will lose trust in it. In addition, manufacturers will be unwilling to market products which could potentially damage their reputation.

The assumption around the benefits of AVs is key amongst those driving the significant commitment that government has made to CAV technology more widely. It is informed by a wider programme of research, development, demonstration and analysis, which is building the evidence base around the potentially transformative impacts of CAV technologies, to support long term investment and policy decisions. This assumption is also informed by the track record of existing technologies such as Advanced Emergency Braking Systems (AEBS), which have proven safety benefits. Further details are included in the Wider Impacts section of this Impact Assessment.

AVs should not be confused with ADAS. Risks associated with the misuse of ADAS are not likely to be applicable to AVs. Skills erosion is sometimes cited as a long-term risk of AVs. This refers to the possibility that human driving skills could fade as ADF is increasingly relied upon. Whilst these risks are uncertain, it is likely that mitigations will be implemented that reduce these risks.

There is potentially a risk that insurers are not able to subrogate a sufficient proportion of claims against manufacturers due to the complexity of proving causation and thus liability in collisions involving AVs, particularly where multiple AVs are involved. This could potentially result in prohibitively expensive insurance costs for AVs. However, as set out earlier in this Impact Assessment, we believe that incentives will exist for manufacturers and insurers to work together to achieve a functioning market for AVs, including on insurance.

The government is keen to support AVs and to maintain international leadership. However, as set out in the Risks and Assumptions section of this Impact Assessment, the risk and impact of any optimism bias would be low. This is because our intelligence on the development of AVs is good, and the costs associated with the proposed intervention are low. Should the risk that AVs are not developed within the time period set out in this Impact Assessment materialise, there would be no additional costs.

The risk of any unintended consequences arising is managed by the plan to review the policy in 5 years' time, when we will be able to see if the market has responded appropriately, and if the policy has worked. Future reviews will be needed as the technology continues to evolve and market penetration increases (for example, considering whether it would be appropriate to move to a first party or strictly liability regime).

8. Direct costs and benefits to business calculations (following BIT methodology);

Familiarisation costs:

We expect the first commercially available ADF to reach the market in 5 years. Therefore, a review of the policy in 5 years' time would enable us to clearly determine how effective the

policy has been at readying the market for AVs based on real world evidence. We can then make changes if necessary to facilitate the AV market. We anticipate that future waves of our regulatory programme will provide an opportunity to review and refine our regulatory approach based on how the market responds. In that sense these proposals are time-limited and we will continue to keep this under review. For this reason, the appraisal period chosen for this Impact Assessment is 5 years.

Business population estimates suggests there are 595 businesses⁸ that would be directly affected by these proposals. It is possible that other stakeholders including vehicle manufacturers will also incur familiarisation costs. There are 38 volume vehicle manufacturers operating in the UK⁹. Each of these businesses is likely to have a regulatory compliance manager who will be required to understand the changes in law. Using the Annual Survey of Hours and Earnings we estimate the average total hourly labour cost for these employees to be £31¹⁰. We assume that the maximum time required for familiarisation will be around half a day (4 hours). This means a total familiarisation cost of £0.08m.

As this is a regulatory provision, it is in scope of BIT. The BIT score is £0.08m (as the impact accrues only in year 1).

The proposals are in scope of “One-in, Three-out” (OI3O), and are a net IN of £0.08m.

9. Wider impacts

The evidence of the impacts the technology will have when it reaches commercial availability is very limited. This is partly because standards that determine aspects of its capability that impact on the benefits it could bring are yet to be agreed, for example. However, we are confident that AVs will bring significant benefits. Further details on this assumption can be found in the Risks and Assumptions section of this Impact Assessment.

Benefits

It is important to note that the measures set out in this Impact Assessment are not likely to materially impact the likelihood or timescales that AVs will reach the market in the UK and do not enable their legal use. However, they address important issues and contribute to a broader programme of regulatory reform that will collectively create the conditions necessary for AVs to be safely and legally used in the UK. The measures set out in this Impact Assessment support the full realisation of the potential benefits of AVs as soon as they become available.

The first AVs are a step along the pathway to driverless cars. In the future, the potential exists for vehicles that allow fully autonomous door-to-door journeys, which could open up mobility solutions to vulnerable groups of society that are unable or unwilling to drive. Supporting the development of this technology could therefore eventually promote social inclusion.

⁸ Business population estimates 2015, Division 65 “Insurance, reinsurance and pension funding, except compulsory social security”

⁹ Source: SMMT market figures, based on sales over 1000 units on year to date figures retrieved 07/10/16

¹⁰ 2015 Annual Survey of Hours and Earnings, Table 2.5a mean hourly rate for corporate managers and directors - £26.10, this estimate was increased by 20.2% to account for non wage labour costs using Eurostat estimates available here http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Labour_costs_per_hour_in_EUR_2004-2014_whole_economy_excluding_agriculture_and_public_administration.png

Safety

Foremost among the potential benefits of AVs is safety. Human error is a factor in up to 94% of road deaths and injuries¹¹. In the UK, over 1700 people are killed on the roads every year, and we have some of the safest roads in the world. Globally, around 1.25 million people are killed on the road each year. CAV technologies are already making significant reductions to these figures.

AXA (the insurance company) and Thatcham Research data suggests that AEBS reduces collisions by 15% and related injuries by 18% in vehicles fitted with the technology¹².

The benefits of AEBS are not only improve safety for vehicles with the feature fitted but also for other road users in terms of reducing rear-end collisions.

Within the next 15 years, for every 10,000 errors made by a human driver, an autonomous vehicle will make just one¹³.

AVs are therefore expected to significantly contribute to maintaining the ongoing trend of reducing road traffic collisions. The insurance industry already recognises the benefits of AEBS, which is reflected in the group ratings system and potentially translates into lower premiums for these vehicles.

By improving road safety, AVs will also contribute to smoother traffic flow (with marginal beneficial impacts on energy efficiency, emissions and journey time reliability) through reducing the disruption that is caused by collisions.

DfT is researching the impact AVs will have on safety and the benefits this could have for network capacity. This research is expected to complete in Q1 2017.

Productivity

Consumers and businesses may also benefit from increased productivity, if some of the time that would otherwise be spent driving can be used productively. Some aspects that affect the potential for in-vehicle time to be used productively, include user trust in the system, internet connectivity, and potential motion sickness.

Industrial opportunity

Supporting these technologies would also contribute to the UK maintaining its leadership position in the development and commercialisation of CAV technologies, which could help drive inward investment, research and development and export opportunities for UK industry.

10. Analytical Assurance Statement

The analytical assurance is moderate. This is because the direct impacts associated with the measures proposed are minimal, but there is little evidence of what the direct costs will be in practice. There is uncertainty in terms of the potential indirect impacts, particularly with respect

¹¹ DfT statistics show that 73% of reported traffic accidents involved driver error (e.g. failing to look properly), 25% involved driver behaviour/inexperience (e.g. aggressive/reckless driving), and 23% involved injudicious action (e.g. failing to stop at traffic lights). Overall, 94% of reported accidents involved at least one human contributing factor. Source: DfT Reported Road Casualties Great Britain: 2014 Annual Report, Table RAS50001: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/467465/rrcgb-2014.pdf

¹² Sources: <http://www.axa.co.uk/about/our-company/driverless-cars/> and http://www.thatcham.org/files/pdf/AEB_FAQ_2015_update.pdf

¹³ Source: www.theiet.org/sectors/transport/documents/av-tst-report-file.cfm?type=pdf

to the baseline. The measures proposed primarily enable rather than constrain, by providing clarity and a framework that seeks to resolve the issues that have been identified, without prescribing to the market how to do so. We have sought to gain the best evidence possible through the consultation and are engaged in a much wider programme of evidence development and analysis to support policy decisions in relation to the full spectrum of issues associated with the connected and autonomous vehicle agenda.

11. Equalities

The measures are “enabling” and would cover anyone who purchases an AV for their personal use, or accesses such vehicles through a fleet operator providing shared mobility solutions. Ultimately, AV technology, combined with new business models, could help increase vehicle access, potentially making it cheaper and more accessible to those who cannot drive as a result of physical, mental, sensory or other impairment. No other equalities impacts have been identified.