

Title: Longer Semi-trailer Trial IA No: DfT00423 RPC Reference No: Lead department or agency: Department for Transport Other departments or agencies:	Impact Assessment (IA)
	Date: 09/11/2020
	Stage: Consultation
	Source of intervention: Domestic
	Type of measure: Secondary Legislation
	Contact for enquiries: freight@df.gov.uk
Summary: Intervention and Options	RPC Opinion: RPC Opinion Status

Cost of Preferred (or more likely) Option (in 2019 prices)			
Total Net Present Social Value	Business Net Present Value	Net cost to business per year	Business Impact Target Status Qualifying Provision
£1,037.00m	£144.12m	£0.57m	

What is the problem under consideration? Why is government intervention necessary?

The current maximum permitted length for articulated semi-trailers is 13.6 metres. Due to the low density of many goods, such as clothes, many operators who are consistently transporting low density goods run out of space on their trailers before they reach the maximum gross vehicle weight permitted. Consequently, a strong environmental case can be put forward for increasing the maximum length of semi-trailers as this would allow a greater volume of goods to be transported with the same number of journeys being undertaken, so achieving a reduction in the amount of pollutants emitted as a consequence of those journeys.

In January 2012 the Department for Transport (DfT) commenced the trial of a limited number of longer semi-trailers (LSTs) where the maximum permitted length of the semi-trailer could be up to 15.65 metres, while maintaining maximum gross vehicle weight limits. Where this space is fully utilised by operators this allows the surface to load 30 as opposed to 26 UK standard pallets for a single-deck trailer with actual loads also depending on whether pallets are stacked. Other deck layouts such as dual-deck would be able to carry up to 60 pallets instead of 52.

The LST trial has seen a reduction in journey numbers and pollutants compared to 13.6m semi trailers, whilst LSTs have operated at least as safely as 13.6m trailers.

The LST trial is not due to end until 2027, however it is felt that by continuing the trial no further statistically significant data would be gathered. The Department is therefore now considering how to proceed, particularly how the benefits achieved under the trial could be maintained if there were no limit placed on the number of LSTs in general circulation, whilst ensuring the LSTs safety record remains at least as good as for 13.6m semi trailers. The Department wishes to maintain the efficiency, environmental and safety benefits seen in the trial environment if LSTs are utilised more widely. Currently, the Road Vehicles (Construction and Use) Regulations 1986 set length limits of HGVs, trailers and combinations - secondary legislation would be required to change these limits and permit wider use of LSTs.

What are the policy objectives and the intended effects?

The main policy objective is to enable the transportation of the same volume of freight by fewer journeys. The intended effects of this are a reduction in emissions and congestion, whilst enabling the freight industry to utilise vehicles more efficiently and at least maintaining road safety levels for all road users.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Do Nothing (Baseline): Under this scenario the LST trial would run until 2027, after which point LSTs would no longer be allowed on UK roads. This is the baseline against which other options are measured.

Policy Option 1 (Lighter additional regulation): Remove the cap on the number of LSTs, allowing the market to decide the quantity which would be in operation. Add some additional regulation designed to ensure the retention of positive outcomes for the public related to safety and effective use in comparison to the operation of 13.6m trailers. This is the preferred option, on the basis that the key drivers of safe and efficient utilisation are maintained, while encouraging the widest realisation of efficiency and environmental benefits.

Policy Option 2 (Heavier additional regulation): This option is similar to Policy Option 1, but with an increased regulatory burden on operators aimed at confirming more efficiency benefits of operating LSTs and therefore an increased positive environmental benefit is achieved whilst also aiming to better ensure LSTs remain at least as safe as 13.6m trailers. It is recognised that given the increased regulatory requirement in this policy option in comparison to Policy Option 1 the implementation of this policy option may deter more operators from choosing to operate LSTs than Policy Option 1 would and so could result in a reduction in the level of environmental benefits achieved.

Policy Option 3 (Widening existing regulation to LSTs): Regulate LSTs in the same way as standard 13.6m trailers are currently regulated. This is lower cost than Option 1 but does not take into account the specific operating issues associated with LSTs.

Alternatives to regulation: In order to use LSTs outside a trial setting legally, the Road Vehicles (Construction and Use) Regulations 1988 must be amended.

Will the policy be reviewed? It will be reviewed at least 7 years from date legislation implemented

Does implementation go beyond minimum EU requirements?	N/A			
Is this measure likely to impact on international trade and investment?	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: 0		Non-traded: 1.22	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible SELECT SIGNATORY: _____ Date: _____

Summary: Analysis & Evidence

Policy Option 1

Description: Lighter additional regulation

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2021	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: £876.87	High: £1,264.62	Best Estimate: £1,073.29

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	£26.43	£17.20	£271.02
High	£39.64	£25.73	£405.64
Best Estimate	£33.04	£21.47	£338.33

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

Freight operators (private sector) - the additional cost of purchasing longer semi-trailers, the costs from increasing the regulatory burden and familiarisation costs on operators.
Central Government (public sector) - further costs have been calculated to assess the impact on reduced taxation revenue as a result of lower fuel consumption.

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

Freight operators and their clients (private sector) – the costs to operators through the increase in accident reporting and the costs associated with licensing requirements. Additional costs to industry on infrastructure adaptation costs.
There is a lack of evidence on these costs and further clarity will be sought throughout this consultation phase to provide a more accurate representation of the total costs to business.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0.0	£96.47	£1,282.50
High	0.0	£116.11	£1,535.64
Best Estimate	0.0	£106.54	£1,411.62

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

Freight Operators (private sector) - benefits include lower fuel usage, increasing productivity due to increased labour from fewer HGVs required to deliver the same amount of freight.
Wider society - lower external costs to society, including congestion, air quality and greenhouse gas emissions, infrastructure and noise impact reduction.

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

The costs of applying to the traffic commissioner for authority to operate LSTs are not monetised but costs are estimated. LST's are expected to reduce the risk of accidents through removal of HGVs from traffic, but longer vehicles are expected to increase the risk of accidents if this risk is not managed carefully. The size of the net impact will be dependent on details around the policy option and behavioural responses, such as the level of driver training implemented. It has not been possible to conclusively determine this through the trial and an estimate of the potential net impact will be included for the final stage impact assessment.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5
A number of key assumptions have been used in this analysis which are explained in more detail under each option. These are around the number of operators using LSTs, costs of LSTs against 13.6m trailers and rigid and drawbar trailer combinations, and the costs involved in the regulatory options. It is assumed that the take-up will be slightly restricted given the regulatory burden, however the savings from using LSTs will be nearer the trial conditions. Sensitivities have been included to capture a range on the costs to business, including regulation, familiarisation, and purchasing costs. These risks and uncertainty is discussed in further detail in the 'risks and uncertainty' section.		

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: £0.59	Benefits: £0	Net: £0.59	
			£2.86

Summary: Analysis & Evidence

Policy Option 2

Description: Heavier additional regulation

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2021	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: £591.72	High: £986.96	Best Estimate: £791.66

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	£26.43	£22.87	£350.54
High	£39.64	£34.24	£525.04
Best Estimate	£33.03	£28.56	£437.79

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

The monetised costs for this option is the same as Option 1, but with the addition of the costs arising from purchasing trackers and software to collect and store the data. There are further additional costs from enhanced driver training required within the first 5 years.

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

The non-monetised costs are the same as Option 1.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0.0	£84.10	£1,116.76
High	0.0	£101.25	£1337.51
Best Estimate	0.0	£92.90	£1,229.45

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

The key monetised benefits by the main affected groups are the same as set out in Option 1.

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

The other key non-monetised benefits for the main affected groups are the same as set out in Option 1.

Key assumptions/sensitivities/risks

Discount rate (%)

3.5

A number of key assumptions have been used in this analysis (as explained in Option 1). It is assumed that the take-up will be even more restricted given the additional regulatory burden when compared to Policy Option 1, but the benefits nearer those observed under the trial. Sensitivities have been included to capture a range on the costs to business, including regulation, familiarisation, and purchasing costs. A further description of these risks and uncertainty is discussed in further detail in the 'risks and uncertainty' section and throughout the analysis.

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: £0.59	Benefits: £0.0	Net: £0.59	
			£2.86

Summary: Analysis & Evidence

Policy Option 3

Description: Widening existing regulation to LSTs
FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2021	Time Period Years 20	Net Benefit (Present Value (PV)) (£m)		
			Low: £770.99	High: £1,029.60	Best Estimate: £902.36

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	£26.43	£7.42	£134.12
High	£39.64	£11.09	£200.50
Best Estimate	£33.03	£9.25	£167.31

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

Freight operators and their clients (private sector) – The additional cost of purchasing longer semi-trailers has been included. Familiarisation costs involved to operators have also been included.
 Central Government (public sector) - further costs have been calculated to assess the impact on reduced taxation revenue as a result of lower fuel consumption.

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

No other non-monetised costs to capture, these do not apply under this option.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0.0	£73.22	£971.49
High	0.0	£88.16	£1,163.72
Best Estimate	0.0	£80.90	£1,069.67

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

The benefits to the main affect groups are the same as set out in Options 1 and 2.

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

The only benefit currently not monetised is the net impact on accident rates. LST's will reduce the risk of accidents through removal of HGVs from traffic, but longer vehicles with increased tail-swing are likely to increase the risk of accidents if operational measures to limit risk exposure are not taken and this option does not demand them. The size of the net impact will be dependent on details around the policy option, such as the level of driver training. An estimate of the potential net impact will be included for the final stage.

Key assumptions/sensitivities/risks

Discount rate (%)

3.5

A number of key assumptions have been used in this analysis which are explained under Option 1. It has been assumed that by applying the same regulation to LSTs as to other articulated trailers, that these may be used inefficiently and lower the savings resulting from them, there may also be higher uptake than the other options, so this has been modelled. Sensitivities have been included to capture a range on the costs to business, including regulation, familiarisation, and purchasing costs. These risks and uncertainty is discussed in further detail in the 'risks and uncertainty' section.

BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: £0.59	Benefits: £0.0	Net: £0.59	
			£2.86

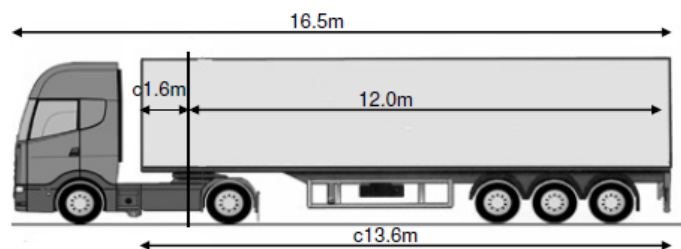
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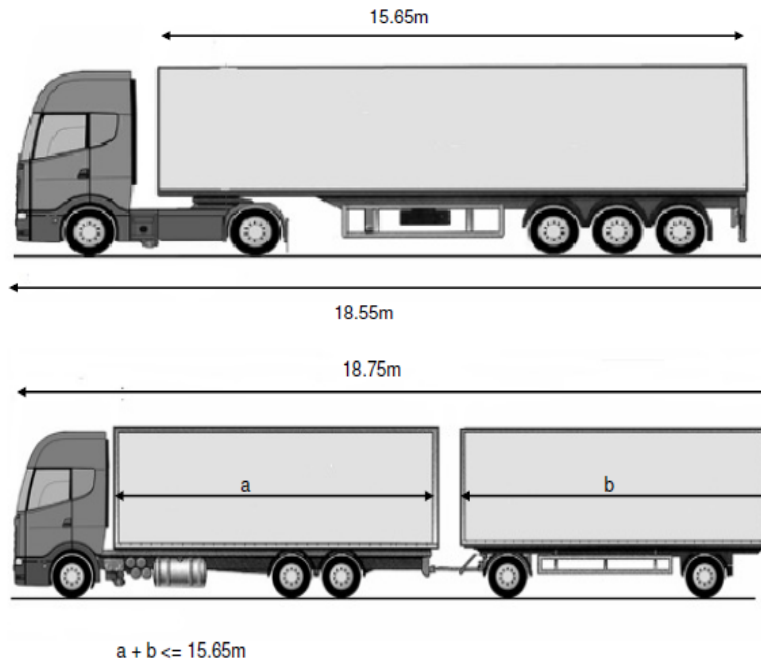
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Background

1. The trial of longer semi-trailers (LSTs), (LSTs are articulated goods vehicles) began in January 2012 with a total allocation available of 1,800 semi-trailers. The length of time the trial was to be conducted for was set at 10 years in order to ensure that operators taking part in the trial could recover the additional costs of purchasing and operating the LST through the efficiencies achieved by the end of its expected useful life.
2. In January 2017 the trial was extended by 5 years and the number of LSTs increased by an additional 1,000. This was to enable more operating experience to be gained, including spreading the trial to more operators. The time extension was also designed to put off the time when it became uneconomic to replace LSTs.
3. Ahead of the trial, it was anticipated that the use of LSTs should lead to journey reductions which in turn would lead to a reduction in congestion, carbon dioxide emissions and air pollutants (PM10/NoX). The trial sought to find out if the expected benefits of allowing operators to operate LSTs in place of standard 13.6m articulated trailers would be realised in practice (hereon referred to as 'standard' trailers). Modelling based on trial data has shown that these outcomes have been achieved. If LSTs were allowed to enter into general circulation these benefits are expected to be maintained to some degree. The extent to which they would be maintained would be dependent on the way LSTs were used outside the conditions of the trial and what, if any, additional regulations already in place for the operation of 13.6m trailers operators of LST trailers would be required to adhere to.
4. The LST trial has seen a reduction in journeys and pollutants compared to standard HGV operation. The trial to the end of December 2018 thus far has seen an average 7.5% distance reduction across operators as a whole and savings of over 37,000 tonnes of CO₂ and 187 tonnes of NO_x. Post-trial, this would be expected to have a positive impact on emissions and congestion. Modelling has been undertaken on the basis that the distance reduction would continue as modelled from the trial observations. In the trial, the highest pollutant savings per mile were on minor roads and 6.2% of the emission savings were found to be within 200 metres of Air Quality Monitoring Areas. We would expect these proportions to continue should LSTs be allowed to enter into general circulation subject to LSTs operating in the same way as they did under the conditions of the trial¹.
5. The schematic below illustrates the differences between a current standard articulated lorry (top), the proposed articulated lorry with a longer semi-trailer (centre) and the standard rigid truck / drawbar trailer combination (bottom) permitted to operate in the UK. Despite stakeholder concerns about the increased road safety risk posed to vulnerable road users resulting from the increased length of the trailer, it should be noted that the total LST combination length is the same as the rigid truck/drawbar trailer combination. It also allows for the same overall loading length in a single trailer body, which may be of benefit in some limited circumstances.



¹ Risk Solutions, Annual Report 2018



Problem under consideration

6. Although the trial is not due to end until 2027, the trial has reached a point where continued evaluation is unlikely to provide additional statistically significant results regarding emissions reduction which would change our current assessment of benefits of operating LSTs in certain circumstances. Statistically significant results have already been obtained, so more expenditure on evaluation is more difficult to justify. The additional key remaining questions relating to the safety of LSTs in use may only be answered outside of a trial setting. Under the conditions of the trial it has been demonstrated that LSTs can be operated at least as safely as standard trailers, however, until LSTs enter into general circulation and are not being operated under the more rigorous conditions of the trial we will know whether LSTs can be operated as safely as standard trailers. Continuing the trial is therefore providing limited value for money given any future data obtained wouldn't change the assessment and only wider circulation will answer the additional questions raised.
7. LSTs have thus far been operating under trial conditions, with requirements as to route planning, reporting journeys, driver training and selection, and a cap on the maximum number of LSTs which can be operated as part of the trial. This creates an operational environment which is unlikely to be replicated beyond the trial. However, by imposing some additional operational requirements beyond those applicable to standard trailers benefits seen during the trial can be maintained and safety risks mitigated.
8. The LST trial originally sought to prove whether the operation of LSTs could improve the efficiency of road transport and if improvement could be achieved this would have the expected positive environmental benefit when compared to moving the same amount of freight by 13.6m articulated HGVs (hereon referred to as 'standard HGVs'). The use of LSTs in an inefficient way, such as regularly using larger-than-necessary vehicles for a given quantity of freight, would lead to additional emissions. However, a single LST has been modelled to reduce emissions by 4.6 tonnes per year, if LSTs are used as efficiently as the trial average.
9. The heavy goods vehicle (HGV) sector is currently reporting a driver shortage. The Road Haulage Association², Freight Transport Association³ and All Party Parliamentary Group for Freight and Logistics all report the industry currently being short of many tens of thousands of drivers and expressing concerns at the scale of this shortage. This shortage is expected to worsen in the event of new barriers to overseas drivers taking up employment in the domestic haulage industry. Whilst there are efforts

² <https://www.rha.uk.net/news/press-releases/2019-04-april/driver-shortage-%E2%80%93-parliamentary-group-needs-to-hear-from-hauliers>

³ <https://fta.co.uk/media/press-releases/2019/october-2019/hgv-driver-shortage-climbs-to-59-000>

being made to remedy this and recruit new talent to the industry, it is unlikely that this will have a significant impact in the immediate future. Covid-19 related market issues may affect this in the short term but the shortage is liable to nonetheless be a medium term challenge.

10. The use of LSTs would lead to a reduction in the number of journeys required to transport the same volume of goods as they could remove up to 1 in 8 journeys⁴ where deployed, providing additional capacity to the industry as drivers would be available to undertake an increased number of journeys.
11. The consultation seeks stakeholder views: on the future of the trial; feedback on the preferred policy option to end the trial and roll out LST usage more widely; and the modelling presented in this impact assessment. As the evaluation is providing limited value for money given any future data obtained wouldn't change the assessment and only wider circulation will answer the additional questions raised the consultation does not put forward as an option that the trial should continue to the current end date.

Rationale for Government intervention

12. Legislation to govern the maximum dimensions of Heavy Goods Vehicles exists because there is a variety of external costs associated with vehicle length and weight. These include accident risk, damage to infrastructure and impacts on congestion. The private market would not be expected to result in the use of optimum sized vehicles from society's perspective and would possibly lead to an inefficient number of journeys being made as operators did not minimise their external costs on society.
13. Currently, there is a 13.6m maximum for semi-trailer length. The trial that began in 2012 has shown there are a number of benefits resulting from extending this trailer length to 15.65m. This intervention is therefore designed to be deregulatory and address a historical regulatory burden.
14. However, it is important that these vehicles are operated safely. Due to the size and mass of heavy goods vehicles, any significant incident may potentially cause severe injury or fatality to road users. Under the conditions of the trial, LSTs have shown they can be operated more safely than standard length semi-trailers, though it must be noted that this is under very specific conditions. Additional safety measures carry additional costs that are fully borne by the operator. A reduction in the number of accidents benefits the operator and wider society. Given the social benefits are higher than the private benefits, without intervention, safety measures may be under provided. Government intervention may be required to ensure road safety standards are maintained.

Current regulatory regime

15. As part of the conditions of the trial, operators must apply for Vehicle Special Orders (VSO) from the Vehicle Certification Agency (VCA) in order to legally operate LSTs on GB roads. Applications for a VSO are assessed on a case-by-case basis. They initially lasted for five years, however they now run until the proposed end date of the trial (January 2027).
16. European legislation, particularly Council Directive 96/53/EC, places constraints on the size of vehicles that EU Member States (and the UK during the transition period) may permit in national or international traffic. For example, for tractor unit/semi-trailer articulated combinations Council Directive 96/53 specifies that the maximum length of a combination is 16.5m and that the maximum length of a semi-trailer is effectively 13.6m (12m to the rear +1.6m to the front of the kingpin). Rigid and drawbar trailer combinations are permitted up to a maximum length of 18.75m. UK Government considers the operation of LSTs outside of a trial is consistent with this European legislation, although this is not agreed by some European institutions. These issues only apply in their current form until the end of the transition period, although they are liable to rule out the use of LSTs for international transports.

⁴ <https://www.gov.uk/government/publications/longer-semi-trailer-trial-evaluation-annual-report-2018/gb-longer-semi-trailer-trial-2018-annual-report-summary>

17. The key item of domestic legislation governing vehicle weights and measures is the Road Vehicles (Construction and Use) Regulations 1986, which transposed EU legislation into domestic UK law and forms the basis for UK enforcement and roadworthiness testing regimes.
18. The Road Vehicles (Construction and Use Regulations) 1986 as amended also prescribe manoeuvrability requirements. These govern the ability to negotiate tight turns, which has been a key issue of concern for some stakeholders.

Policy Objectives

19. The objective of this policy is to facilitate more efficient and environmentally beneficial freight transport. It seeks to permit the transportation of an equal amount of freight in fewer journeys by allowing longer vehicles, which will achieve an emission saving as less pollutants will be emitted during the transportation of the same amount of goods. It is also anticipated that this will have a positive benefit on congestion as fewer trips will be required.
20. The additional policy options which propose additional regulations on top of those which currently exist for the operation of standard trailers, be put in place with the aim to support the safe and productive operation of these vehicles.

Description of options considered

21. Each of the policy options considered aim to maintain the same broad technical specifications from the trial, extending the length of semi-trailers whilst maintaining the maximum gross vehicle weight limit.
22. The Department proposes a permanent extension to the currently allowed UK maximum 13.6 metre semi-trailer length by up to an additional 2.05m, leading to an overall maximum semi-trailer length of 15.65m and total vehicle length of 18.55m. Such a vehicle would have to comply with all other regulations. This would consequently bring an articulated heavy goods vehicle (HGV) length in-line with a rigid/draw-bar trailer combination (in terms of total vehicle length and the load-platform length). The additional 2.05m of length of a semi-trailer allows an additional 8 to 16 pallets to be transported, depending on whether the height of the trailer permits pallets to be stacked.
23. The current maximum weight for a tractor unit/semi-trailer articulated combination is 44 tonnes gross vehicle weight (gvw)⁵ and this restriction would be maintained. Some road transport operations, particularly those conveying light consumer goods, after filling a standard articulated trailer to capacity, still have a significant amount of their gross vehicle weight capacity available to them which they are unable to utilise. Despite the limited increase in trailer weight due to an LST being longer than a standard articulated trailer, such operators would be able to utilise all this extra space and still remain within the 44 tonnes gvw restriction. The Department's proposal would therefore allow such operators to convey more cargo within the same number of journeys (thereby providing for efficiency gains and lower emissions for each ton lifted)⁶.
24. In deciding specific policy options, we looked at the objectives of the trial and policy to establish the goal of reducing the number of HGVs on the road whilst transporting the same amount of freight resulting in an environmental benefit being achieved whilst ensuring that outside of trial conditions LSTs incident rate remains as good as or better than standard trailers. From this we identified 8 factors that may have contributed to the positive results and established low to high policy options based of these areas.

⁵ NB: Some vehicles are able to run at heavier weights by exception and subject to more stringent requirements.

⁶ Risk Solutions

25. The 8 factors considered were:

- a. Vehicle quantity – The maximum permitted total LST fleet size under the trial is restricted to 2,800;
- b. Data collection – Operators who are trialling LSTs are required to provide to the Department information relating to journeys LSTs undertake, such as distance the LST travelled and how much of the volumetric capacity of the LST was utilised for each journey undertaken;
- c. Driver training and/or certification – Operators are required to provide training to drivers before they operate LSTs, so they are aware of the unique characteristics of how an LST operates in comparison to a standard articulated trailer. The nature of and length of the training is for each individual operator to determine, however, it is proposed that operators will be required, when planning their training, to give consideration to guidance in respect to training that should be provided. It is intended that this guidance will be put together in consultation with operators who have taken part in the trial in order to capture established best practices;
- d. Incident reporting – Operators are required under the conditions of the trial to notify the Department where the LST is involved in an incident where an injury is caused to a person, and are required to notify the Department of any incident where an LST is involved in an incident which causes damage to property;
- e. Controls on road usage – Under the trial the Government has set no restrictions or guidelines on the roads LSTs can operate on. The expectation is that LSTs would for the vast majority of each journey operate on the Strategic Road Network in England and the equivalent networks in Scotland and Wales as like standard articulated trailers the expectation is that they would be moving large loads between distribution centres and between distribution centres and suppliers and retail sites (throughout the remainder of this document where “Strategic Road Network is used” this should be taken to include the equivalent networks in Scotland and Wales as well);
- f. Operator licensing regime – Under the trial, operators are not required to seek approval from the traffic commissioner to operate LSTs. The only requirement is that operators have sufficient capacity on their operator’s license to operate the number of LSTs they would like to. If they do not have sufficient capacity, they are required to make an application to the traffic commissioner to request the capacity on their license be increased as they would and in the same way as they would if they required additional capacity to run more standard articulated trailers;
- g. Vehicle specification – Under the trial operators have the choice of two lengths of LST. The 14.6 metre and the 15.65 metre. They also have the choice of whether the trailer should operate a command steer, self-steer or active steer system which affect the tail swing behaviour and driving characteristics of the trailer. In the case of the self-steer option there is a requirement when commissioning the manufacture of a self-steering LST that consideration should be given as to whether there is a technical requirement for the trailer wheels to automatically lock in place (i.e. the wheels are unable to turn as they would if the trailer were going round a corner) when the LST is travelling at speed;
- h. Maximum trailer age – Under the trial no maximum operating life, either in terms of age, distance travelled, or tonnes lifted, has been placed on LSTs.

26. Additionally, we looked at what to do with longer semi-trailers that are currently on the trial moving forward should approval not be given for unrestricted numbers of longer semi-trailers to operate.

Option 0: Do nothing (baseline)

27. The trial continues as planned until the current end date, January 31st 2027. The cap of 2,800 vehicles would be maintained. Operators would continue having to apply for an allocation of LSTs and be required to apply for a Vehicle Service Order (VSO) covering each LST they wish to operate. Operators would also be required to continue to have to submit data returns every 4 months regarding each trailers journey log.

28. At the end of the trial, trailers would cease to be able to operate as the VSOs would expire and as it stands LSTs are not permitted under Construction and Use Regulations. This may be before the end of a standard lifecycle for some trailers which have been purchased by operators at their own cost.

29. This option would not achieve the policy objectives. However, a 'do nothing' counterfactual is used as the baseline against which the impacts of other options are estimated in line with Green Book principles.

Option 1: Lighter additional regulatory option (PREFERRED POLICY)

30. This option is the preferred policy option as it allows the whole of the freight industry to have unrestricted access to LSTs where operators can identify that LSTs could be of benefit to their business and so enable the industry to make an important contribution to reducing emission levels. The regulations it is proposed are put in place, are in addition to those operators would be required to adhere to if they were/are operating standard trailers. They take into consideration concerns several interest groups have about LSTs being operated on inappropriate roads and increasing the road safety risk, particularly to vulnerable road users such as cyclists and pedestrians. The regulations are designed to ensure that the excellent safety record of LSTs under the trial is maintained outside of the trial conditions.

31. This option would see the removal of the cap on the total number of LSTs allowed to be operated by the road haulage industry, therefore allowing the market to decide the quantity which would be in operation based on commercial need. This option would reduce the amount of regulation and monitoring of LSTs required by the Department on the basis that the environmental and economic case for operators using LSTs in certain circumstances has been proven, and that to maintain such reporting requirements would only discourage operators where there is a sound business case for doing so from switching to operating LSTs. To help maintain the good safety record of LSTs operated under the trial this option proposes that regulatory measures a and b listed below are continued, whilst regulatory measures c - g will be introduced to ensure LSTs are being operated only on roads appropriate for their operational characteristics:

- a. Reporting to the department where an LST is involved in an incident which results in a loss of life, injury or damage
- b. Additional driver training being required;
- c. Operators will be required to apply to the traffic commissioner for permission to operate a permitted number of LSTs;
- d. Before allowing an LST to operate a fresh route, the operator will be required to undertake a risk assessment of the route the LST will take to ensure the route proposed is appropriate for an LST to follow;
- e. Operators will be required to retain a record of all risk assessments undertaken prior to LSTs undertaking journeys for up to five years and will be required if requested to do so by the police, DVSA, OTC or traffic commissioner to provide the records or records of risk assessments undertaken;
- f. Operators will be required to put in place a system where drivers are able to provide feedback (either before or after a journey has been undertaken) where they believe it is not appropriate for the LST to operate on the route proposed/followed. It will be a requirement that a record of this feedback and response provided by the operator is kept on record for five years;
- g. Operators will be required to undertake an appropriate level of compliance monitoring to ensure LSTs are being operated on the routes set and to take appropriate action where deviations are identified. It will be a requirement that a written record of compliance checks undertaken, the outcome of such checks and the outcome of any action taken is kept for five years.

32. Where operators consider that it would be beneficial to their business to operate LSTs operators will be required to apply to the traffic commissioner for permission to operate a permitted number of LSTs. The application would be made in the same way and follow the same process to determination as would be the case if the application was for permission to operate standard trailers. Given the increased risk of operating LSTs when compared to standard trailers because of their greater length, traffic commissions could when considering a first application consider:

- a. An operator's past compliance history;
- b. How the operator proposes to comply with the requirement to undertake a risk assessment of all proposed LST routes;
- c. How the operator will comply with the requirement to maintain a record of risk assessments undertaken;

- d. How the operator proposes to put in place a system for drivers to provide feedback on the appropriateness of routes proposed / operated on by LSTs;
 - e. How the operator proposes to undertake compliance checks, action they propose to take where failures in compliance are identified and how they propose to maintain records of the compliance checks.
33. When considering any request by an operator to increase the maximum number of LSTs they are permitted to operate, traffic commissioners will be permitted to take into consideration in particular the same points.
34. LST operators would be required to report, in the same way as operators currently do under the trial, any incident on a public highway or on private land which resulted in a death or injury being caused. Operators would also be required to report, in the same way as operators currently do under the trial, any incident on a public highway which results in damage being caused. It is, however, anticipated that in the future it will be possible to collect such data relating to deaths and injury through Stats 19 data currently collected.
35. Operators would be required to provide drivers operating LSTs with training before they are able to operate LSTs. There would be a requirement that this specific training lasts a minimum of half a day and that operators would follow a LST training best practice guidance document when considering what training they would provide to drivers. Operators would also be expected, where a driver of a LST is involved in an incident to consider whether both the driver involved in the incident and all other drivers entitled to operate LSTs should undertake further training or be provided with information about the incident to minimise the risk of the incident happening again.
36. For vehicle specification, no changes are proposed be made to the technical regulations which govern the design and operating requirements of LSTs, given the experience of the trial.
37. It is proposed in this option that no upper age limit should be placed on the life of LSTs as with standard trailers.

Option 2: Heavier additional regulatory option

38. This option is similar in principle to policy Option 1, but with a few key differences which increases the amount of regulation related to operating LSTs.
39. Like Option 1, Option 2 does not place any restrictions on the total LST fleet size and applies the same reduction in regulatory and monitoring measures required by the Department in relation to the operation of LSTs using the same rationale.
40. This option seeks to bolster the regulatory measures proposed under Option 1 in order to better ensure the safety record of LSTs is maintained. Like under Option 1 the same reporting measures are required where there is loss of life, injury or damage. This option strengthens the driver training requirements, requires operators to run each LST at least 80% of each journey on the Strategic Road Network and Abnormal Road Network and requires operators to be able to accurately record the route each LST takes for each journey, keep a record of that route and to be able to provide data of journeys undertaken on request.
41. This option would require operators to run each LST at least 80% of each journey on a defined network consisting of the Strategic Road Network and other major routes used frequently for abnormal loads. To achieve this, operators would be required to ensure appropriate route planning is undertaken before each journey, undertake an appropriate level of compliance checks to ensure this requirement was being achieved and taking appropriate action where this was not being achieved. Operators would also be required to maintain records to demonstrate both prior planning before journeys are undertaken and compliance checks are being undertaken.
42. To ensure operators are compliant with the 80% requirement, operators would be required to collect data on the route each LST takes for each journey and the possibility existing for this data to be called

for, examined and enforcement action taken where appropriate. To ensure operators collect data on every journey an LST undertakes operators will be required to be able to accurately track by GPS LSTs they operate and have a system in place to collect and store this data for five years. The operators will also be required, should the police, DVSA, OTC or the traffic commissioner request such data, to format the data in the way required so that they are able to provide to the requestor a map of the route(s) requested in order that the requestor is able to identify whether the 80% requirement is being achieved.

43. The police, DVSA, OTC and the traffic commissioner will be able to request such information whether the matter being considered relates specifically to that operator's operation of LSTs or not.
44. Where operators consider that it would be beneficial to their business to operate LSTs operators will be required to apply to the traffic commissioner for permission to operate a permitted number of LSTs. The application would be made in the same way and follow the same process to determination as would be the case if the application was for permission to operate standard trailers. Given the increased risk of operating LSTs when compared to standard trailers because of their greater tail-swing, the traffic commissioner would when considering a first application be free to take into consideration the same points as set out in Option 1 and in addition:
 - a. The process the operator intends to put in place to assess the routes it is proposed LSTs will undertake to ensure routes comply with the 80% requirement;
 - b. The process the operator intends to put in place in respect to undertaking compliance checks and actions they propose to take where failures are identified.
45. When considering any request by an operator to increase the maximum number of LSTs they are permitted to operate, traffic commissioners will be free to give consideration to the same points as listed in Option 1.
46. In regards to driver training the requirements would include those for Option 1. However, there would be the additional requirement that drivers would, as part of their ongoing learning in order to renew their certificates of professional competence (CPC) every 5 years be required to undertake a specifically approved LST training course in order to continue to be able to operate LSTs.
47. In respect to incident reporting and vehicle specification the requirements would be the same as under Option 1.
48. Finally, for trailer age it was decided that operators would be required to apply to the traffic commissioner on an annual basis for approval to continue to operate a LST once the trailer was over 10 years old. This requirement was felt necessary to ensure the expected benefits would continue to be achieved, particularly once LSTs had been sold on the second-hand market in order to ensure that they did not become the default option thereby replacing the operation of 13.6m trailers by a large portion of the industry.

Option 3: Allowing LSTs to enter general circulation and operate on the same basis as 13.6m semi-trailers

49. This policy option, like Options 1 and 2, does not place any restriction on the total LST fleet size. In addition it proposes that LSTs should be allowed to operate under the same restrictions as standard trailers do, therefore placing no additional regulatory burden on operators.
50. Although the introduction of LSTs would provide operators with another option in regards to how they transported goods, operators would not be required to apply to the traffic commissioner for specific authority to operate LSTs. The operator would be provided with authority automatically under the maximum number of standard trailers they have authority to operate. Operators would only be required to make an application to the traffic commissioner if they did not have sufficient capacity on their operator's license to run the number of LSTs they wished to in the same way the operator wished to increase the number of standard trailers operated but had reached the maximum permitted on the license.

51. Under this option operators would, however, still be required to ensure drivers operating LSTs had undertaken appropriate training in the same way as required under Option 1 with the exception no minimum amount of time would be set as to how long this training would have to last.

Recommended option

52. Our preferred option is Option 1. This option allows the whole of the freight industry to have unrestricted access to LSTs where operators identify that LSTs could be of benefit to their business and so ensure the industry makes an important contribution to reducing emission levels.

53. Option 1 would reduce the amount of regulation and monitoring of LSTs required by the Department on the basis that the environmental and economic case for operators using LSTs in certain circumstances has been proven, and that to maintain such reporting requirements would only discourage operators when there are both business and societal benefits in operating LSTs.

54. This option is designed to support maintaining a good safety record for LST operation. The trial has shown that operators are individually able to identify and provide the training they feel their drivers require to understand the unique operating characteristics of LSTs and for LSTs to be operated at least as safely as standard articulated trailers. Given the success under the trial of the training that has been provided to drivers operating LSTs (shown by LSTs very favourable safety record), this option seeks to broadly replicate what has been done in the trial.

55. The requirement that LST operators would be required to notifying the Department where the LST is involved in an incident where an injury is caused to a person, and would be required to notify the Department of any incident where an LST is involved in an incident which causes damage to property on a public highway will allow the Department to quickly identify and take action should the rate at which LSTs are involved in such incidents be significantly above the rate expected.

56. Not only does this option present the highest NPV out of the options available, it provides the benefits according to the policy objectives while balancing the potential increased safety risks that could emanate from this regulatory change. The assessment is that under Option 3 the risk of accidents and therefore the societal impacts would be higher than for Options 1 and 2, and if captured this in the monetised assessment this would reduce the difference in NPV across these options. Option 2 would also meet the policy objectives; however, it will do so at an increased cost to business due to the higher burdens on operators that the regulation places.

Innovation Test

57. Further to the sensitivities and risks outlined throughout this impact assessment, it is also precedent to outline any risks and sensitivities that may affect future innovation of the freight market. This is particularly the case where the legislation being sought to be changed here could hinder future development of technologies and require minor changes in the future.

58. Given the policy intervention here, and its deregulatory nature, the impacts on future innovation are expected to be low. This is given that we are prescribing that it is solely the length of the LSTs themselves will be subject to this new regulation and not the length of tractor and trailer combination. However, some innovation has been made and more is possible related to the steering of the trailers which is needed to meet parameters for turning. Should the operation of longer length LSTs be considered it is likely that given how close a 15.6m trailer and tractor combination is to the maximum permitted combination length that these regulations would require revision also. However, before doing so a number of questions would need to be answered:

- a. Would allowing an even longer trailer to operate have any benefit or would any additional volumetric capacity be unlikely to be utilised due to the additional weight of the trailer. It is likely that this would require the current 44t maximum GVW limit to be increased which would necessitate an assessment of bridges to identify whether any restrictions should be placed on the maximum permitted GVW which could cross all bridge. This would be expensive and time consuming.

- b. What would be the potential road safety impact of operating such trailers. A road network currently already exists which is approved for loads over 44t or longer than the maximum permitted combination length to travel on. It is likely that roads outside this network would have to be reassessed to identify whether such vehicles could safely operate on these roads.
- c. Future innovation might see the inclusion of more hybrid or electric tractor units which might lead to a change in the cab size of the HGV, which could increase the length of the vehicle. Through only specifying the trailer length, this would have no impact on future regulatory changes based on this regulation change.

2.0 Costs and Benefits

Summary of analysis and results

£million, 2019 prices, PV 20 years	Option 1			Option 2			Option 3		
	Low	High	Best Estimate	Low	High	Best Estimate	Low	High	Best Estimate
Business costs	404	269	337	523	349	436	199	133	166
Non-business costs	2	2	2	2	2	2	1	1	1
Business benefits	466	583	486	406	507	423	353	441	368
Non-business benefits	816	953	926	711	830	807	619	723	702
NPV	877	1,265	1,073	592	987	792	771	1030	902
Business NPV	62	314	149	-118	158	-14	154	308	202

59. The use of LSTs leads to changes in the patterns of private and societal costs and benefits, through two main channels:
- a. the change in articulated HGV mileage, and
 - b. the change in the impact of each articulated HGV mile driven.
60. The use of LSTs can enable the same overall amount of goods to be transported with reduced overall lorry mileage given its additional capacity. This should deliver private benefits (e.g. reduced operating costs for hauliers) as well as social benefits (e.g. reduced congestion and emissions). However, we expect these benefits to be partially offset by an increase in the private and social costs per mile driven (e.g. increases in emissions) associated with the increase in vehicle size and weight and its impacts on more challenging manoeuvrability. In this IA, we have been able to quantify and monetise the beneficial impact of changes in lorry mileage, but not the scale of the additional cost per mile driven. As we develop the analysis, we expect to be able to better monetise some of these impacts, which would reduce the NPV and seek to provide a better estimate of the net private and social impacts of LSTs.
61. Across each option, there is uncertainty around the level of uptake which has been generated based on trial data and scaled up to the post-trial environment using established data sources. However, this uncertainty has not been reflected in the high/low range of costs and benefits. The NPV will, broadly, be proportionate to uptake. This means that if the scale of uptake is higher/lower than expected, the NPV will follow the same direction, but this should not significantly change the relative costs and benefits only the scale of the NPV. We will look to reflect a broader range of drivers of uncertainty in the final stage impact assessment.
62. There is also a trade-off around the degree of regulation for LSTs. Regulatory measures, such as route risk assessments and driver training, are intended to ensure that LSTs are used in a way that maximises their benefits and minimises their costs. However, regulations need to be balanced against the burdens they impose on operators and could lead to lower levels of uptake and use of LSTs which have proven

under trial conditions to deliver the desired policy outcomes. As noted throughout the impact assessment and in the risks section, assumptions on the regulatory burden posed between the options assessed have been determined. These assumptions affect both the level of uptake, as driven by the regulatory burden imposed, and the resulting distance savings which is the behavioural response resulting from the use of LSTs under each level of regulation. There is moderate uncertainty around the broad determination of these assumptions as discussed in the risks and uncertainty section, and we are seeking clarification on the uptake assumptions throughout the consultation period with industry. The expectation that unless the regulatory options change significantly, the distance savings modifiers will remain unchanged for the final stage impact assessment.

The scaling model

63. The scaling model underpins the whole of this analysis by providing a way of forecasting the LST trial data and estimating future uptake. This is applied in Options 1-3 to compare the impacts against the baseline.
64. The Department commissioned Risk Solutions to design a process to collect data to support the evaluation of LST performance and set up the initial systems for data collection from operators. Risk Solutions act as an independent authority to review the operation of the trial and then report back to the Department on the usage of the LSTs including key statistics that have been used in this impact assessment.
65. The production of a scaling model was commissioned by the Department as part of the trial contract to provide a method for scaling up the trial data and reporting the results suitably for use within the economic analysis for the next impact assessment stages. The data received throughout the trial period, alongside sample data from the Continuing Survey of Road Goods Transport (CSRGT) allows the forecast of uptake and usage of LSTs until 2040. The CSRGT data is a survey of GB-registered HGVs which provide details of their UK activity within a specified week to allow the Department to build a picture of domestic activity of GB-registered hauliers. Further detail and aggregated statistics can be [found here](#).
66. The modelling method used first identifies a cluster of journeys in the 2017 trial data which had statistically significant differences in the percentage distance saved by operating LSTs, which was best clustered by the type of goods carried. These clusters were combined with data on projected take-up of LSTs gathered from operators in 2017 by Risk Solutions and mapped to the goods type. The projected uptake was taken from a survey launched in 2017 which had 126 responses from operators to validate information sources and inform the further analysis. The survey yielded information on the drivers for replacing vehicles and the time horizon's in doing so, which are key inputs into the scaling model.
67. Within the CSRGT data, the goods types identified above were mapped to the 'Commodity' field and specific exclusions were applied to those segments of the CSRGT data which would not be amenable to use of LSTs. These include those that would not benefit from the additional cargo as the additional weight of an LST exceeds that it would add to the payload and only applies to large articulated HGVs in non-urban journeys. The future projection model then calculates the number of LSTs and miles saved based on when future policy changes might occur. The distance savings calculated from the model is also converted estimates of avoided emissions using emissions factors generated from emissions and route modelling based on actual trial data. An assumption within the model is that all the tractor units are Euro V engines to align with the pre-trial emissions estimates (which were based on Euro V), however there will be an increasing number of tractors with Euro VI engines in circulation over the timeframe of the impact assessment period.

68. The change from Euro V to VI primarily affects the projections for Air Quality impact from NOx, with little or no influence on the modelled Greenhouse Gas Emissions. This will be captured in the modelling at the final stage impact assessment using Euro VI emissions factors and profiling of the fleet. At this stage, it would be expected that the NOx emissions saved would reduce due to the increased efficiency of Euro VI vehicles, and the fuel savings would also reduce due to the costs of additives such as Ad-blue. As CO2 emissions are (and NOx is less so) based on fuel consumption, there is some variability these numbers as vehicles become more efficient over time, and we will review this modelling for the final stage.
69. The scaling model utilises two different take-up scenarios, take-up A and B. Under take-up A, it uses the initial findings from the survey to forecast the increased usage over the first 10 years of the policy introduction. After this, there is an assumption that a signalling effect would take place and the infrastructure improvements would be more accommodative to LSTs being used. The assumption on 10 years has been used from conversations with industry on how long it would take to factor these into improvement plans and for these works to be carried out. There is some uncertainty around this which is discussed in the risks and uncertainty section. For the consultation stage, we have omitted the second uptake scenario from the forecasts given the uncertainty but would look to include this at a later stage. If the consultation did not yield information to warrant the inclusion of this, then we would continue the existing approach with a sensitivity on this take-up, but the risk is that we would be underestimating the demand for LSTs in the best estimates.

Question 1: Does the assumption on the time-taken for infrastructure changes (10 years) follow your expectation? If not, what would you expect this to be and what would drive this?

70. Further to the take-up scenarios, we also have a modelled transition year whereby there is no growth in LST numbers or modelled distance savings. This is due to the expectation that there would be a delay in understanding and implementing business changes after the regulatory changes, coupled with the delay in manufacturing the LSTs required to meet the demands placed. Currently we have assumed a regulation introductory year of 2021, and therefore 2021 is a transition year with modelled uptake starting from 2022. In theory, further LSTs may begin operating before 2023 if they place orders early, but these would be captured in the following year.
71. We have been conservative on some of the assumptions and have used a sensitivity on the outputs reflecting the uncertainty surrounding the uptake based on the regulation against that of the trial conditions, therefore we have assessed any savings would be lower outside trial conditions as some inefficiency might occur, and that the regulation imposed may act as a barrier to deciding to use LSTs.
72. Given the use of the scaling model, it has allowed us to forecast the number of LSTs we would expect in operation based on the average miles saved per LST observed in the trial. These have been summarised in 5 yearly periods in the table below for each option.

LSTs in operation	2020	2025	2030	2035	2040
Option 1	2,655	12,541	16,557	17,488	18,471
Option 2	2,655	10,973	14,487	15,302	16,162
Option 3	2,655	9,580	12,648	13,359	14,110

73. Furthermore, the scaling model allows for the calculation of the miles saved through the introduction of the policy, based on the approaches set out above. This currently assumes that the observed trial

savings would hold as LST numbers increase, where there is potential that this would decline as LSTs enter general circulation. This would be assessed throughout consultation.

74. These vehicle miles saved are summarised in the table below in 5 yearly periods under each option.

Vehicle miles saved (million miles)	2020	2025	2030	2035	2040
Option 1	9.70	45.82	60.49	63.89	67.48
Option 2	9.70	40.09	52.93	55.90	59.05
Option 3	9.70	35.00	46.21	48.80	51.55

Option 0 – Baseline

75. There are no direct costs associated with this option as this is the counterfactual and will be used to compare further options against. The counterfactual considers the current policy whereby the trial continues to operate until it expires then operators would return to the baseline of the continued use of standard-length trailers. Therefore, it is only necessary to model the remaining trial period to calculate the impact from increasing the numbers of trailers to those observed in Options 1 to 3. Currently the trial will end on 31 January 2027, however for simplicity, we have modelled the trial ending at the end of 2026.

76. Throughout the analysis, the costs and benefits have been modelled by taking the difference in the numbers of vehicles (and the resulting distance savings and emissions) under the baseline and the take-up modelled for each option through the scaling model. Therefore, options 1-3 present the additional impacts compared to the trial continuing until the end of the period, capturing the diminishing usage which is explained below.

77. It is assumed that freight operators with current LST VSOs will continue to use their LSTs as they have currently throughout the trial period, replacing the trailers in line with expectations of wear and tear or damage incurred. However, once a trailer reaches its end of life we have assumed that the operator would replace the trailer with a standard one even if this is before the end of the trial. This is due to the increased cost in purchasing an LST, and businesses might not be able to receive the benefits to warrant the purchase over a lower usage period. Based on the current evidence, the average life expectancy of an LST trailer is around 10 years⁷, and for the purposes of modelling, those already in use will cease to be operated when they reach 10 years of age. However, we do acknowledge that a trailers life expectancy is based on the miles travelled, and this might be different for the first and subsequent owners, but we will use the average of 10 years for modelling purposes until a more reflective average is obtained. Currently, trailers are only a maximum of 7 years of age, so the first trailer lost in the counterfactual will be in 2022. We are seeking in consultation advice on the life expectancy of trailers to inform the average life expectancy used in the final stage of the impact assessment process.

Question 2: What is the current operating life expectancy of a LST trailer (we currently assume 10 years)? If this is different, what drives this? Is this different to a standard trailer?

⁷ Some sources (such as the [Transport Engineer Report](#)) cite a trailer life of 11 years, so the 10-year assumption may be conservative.

78. When the LSTs reach their life expectancy, we have assumed that these will be scrapped as they no longer have useful remaining years and the resale market will diminish as the trial nears its completion. This in line with observations from discussions with industry, as many LSTs which are being operated on lease hire which are due to renewal are not being renewed with LSTs until a positive decision is made, which will contribute to this decrease. Within the modelling we have assumed there would be no net gain from scrapping LSTs (i.e. the costs of disposal equal the scrappage value of the trailer). However, we are seeking clarification as part of the consultation on an appropriate scrappage value which will be presented as a benefit of the counterfactual if this is different from zero.

Question 3: What are the expected scrappage value of an LST trailer (this should capture the price paid for the trailer minus the costs of disposal)? If the value depends on the specific LST design, please note the factors driving this variance.

79. Throughout this analysis, a 20-year appraisal period has been used. This differs from Better Regulation standard practices due to the expectation that most operators who are small or medium businesses won't purchase LSTs immediately and will wait until they need to replace a trailer. Upon discussions with our partner Risk Solutions⁸, it is expected that this could take up to 10 years for these businesses to replace their trailers. Given the expected life expectancy of the trailers being 10 years, we have modelled this 20-year period out to 2040 to capture the life-cycle benefits of the trailers introduced in 2030 to capture the full range of benefits.

Option 1 – Lighter additional regulation (PREFERRED POLICY)

80. This section presents the analysis undertaken for the first option, whereby the number of LSTs being operated is forecast by modelling undertaken by Risk Solutions but using cautious assumptions about the uptake. Under this option, conservative assumptions have been used and it is assumed that due to the proposed changes in regulation and the lower monitoring imposed than under the trial, the expectations would be lower total savings from LSTs than were achieved on the trial. Given there are also some restrictions and regulation in place, there will be reduced incentive for adopting them in comparison to the general circulation option.

81. Subject to responses to the consultation questions outlined in this document, we will seek to further strengthen the assumptions used in this analysis for the final stage of this policy.

Impact	Type of impact	Direct/Indirect
<u>Costs</u>		
Initial assessment	Business, Transition cost	Direct
Viability assessment	Business, Transition cost	Indirect
Trailer replacement costs	Business, Ongoing cost	Indirect
Regulation costs	Business, Ongoing cost	Indirect
Taxation revenue	Non-Business, Annual cost	Indirect
<u>Benefit</u>		

⁸ In the 2017 future uptake survey conducted by Risk Solutions, 55% of respondents suggested a replacement cycle of 5-10 years.

Fuel saving	Business, Annual benefit	Indirect
Labour saving	Business, Annual benefit	Indirect
Tyre saving	Business, Annual benefit	Indirect
Repairs and maintenance savings	Business, Annual benefit	Indirect
VED and RUL savings	Business, Annual benefit	Indirect
Congestion	Non-Business, Annual benefit	Indirect
Air Quality	Non-Business, Annual benefit	Indirect
Greenhouse Gases	Non-Business, Annual benefit	Indirect
Infrastructure	Non-Business, Annual benefit	Indirect
Noise	Non-Business, Annual benefit	Indirect

Summary

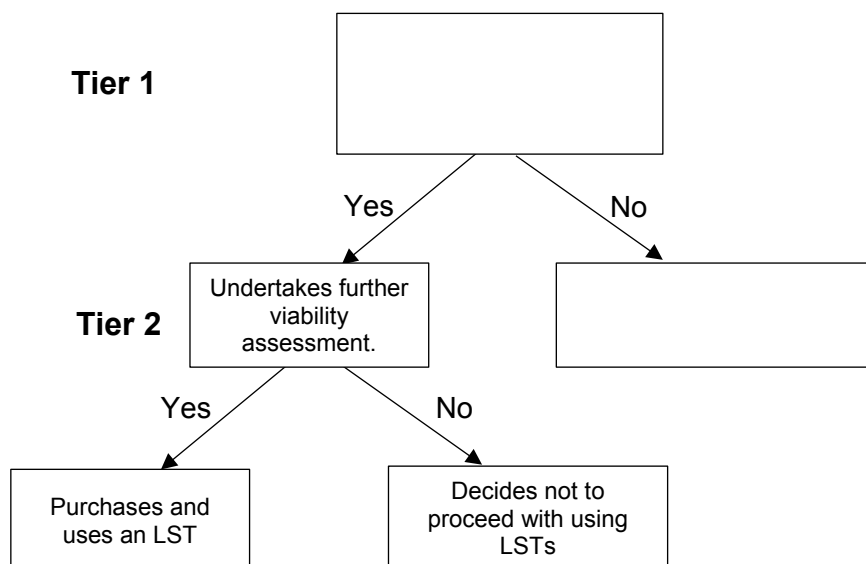
£million, 2019 prices, PV 20 years	Option 1		
	Low	High	Best Estimate
Costs			
Trailer Replacement	216	144	180
Taxation Revenue	2	2	2
Regulation costs	150	100	125
Initial assessment	10	7	9
Viability assessment	28	19	23
Total Costs	406	271	338
Benefits			
Fuel Saving	140	174	145
Labour Saving	268	335	280
Congestion	471	608	581
Air Quality & Greenhouse Gases	152	152	152
Infrastructure	133	133	133
Noise	60	60	60
Tyre saving	12	15	12
Repairs & Maintenance saving	38	47	39
VED and RUL saving	9	11	9
Total Benefits	1,283	1,536	1,412
NPV	877	1,265	1,073

Costs

Transition costs

Costs associated with familiarisation

82. Within this category the familiarisation costs have been broken down into two Tiers, the first being those who will review the regulatory change to identify at a high level whether there is an opportunity for their business to operate LSTs. The second Tier is where the answer to this initial question is yes, and they will then review the changes in more depth and assess whether they would be viable for their business. This is summarised in the diagram below.



Transition costs (i) Review legislation

83. It has been assumed that all operators who operate standard trailers will choose to understand the regulatory change to identify whether the opportunity to operate LSTs will enable their business to operate more efficiently or to ensure that it does not affect their business, regardless if they choose to adopt the change or not. This is referred to as a 'Tier 1' cost. These costs are likely to arise from a single/group of individuals within an organisation to review the regulatory change to ensure they are still compliant and will have some time cost resulting from this. Following from the other costs, the costs has been estimated from the amount of time we would expect this to take and applied this to calculate the overall cost based on an average day rate. This is presented as a direct cost in this policy as the expectation is that all operators to do this irrespective as to whether they wish to use LSTs or not.
84. The operators in scope for the Tier 1 cost are those who have a HGV operator's license, which has been obtained from Table 1 in the Traffic Commissioners Annual report⁹. This report provides us with all the goods vehicle operator licenses in the UK by the type of licence: restricted, standard national and standard international. It is assumed the total operators in scope to review this legislation will be those in the restricted and standard national category given that these cannot be operated under international regulations and therefore those operators won't use LSTs. This could be overestimating the number of operators in scope as some of these may not choose to review the regulation change and will act on an initial instinct, or some will operate on hire for reward with no trailers of their own¹⁰. Given this, we have estimated the cost based on the individuals involved at different levels of the business which would be involved in making the decision. For example, in smaller operations this is likely to be the owner operator or director and in larger businesses, transport managers with final sign off from directors or a board.
85. Given this range, we have assumed that a transport clerks, and either a transport manager or director would make this assessment. Using the ONS ASHE data by detailed occupation¹¹, we have derived estimates for time based on the hourly pay for 'managers and directors in transport and distribution'

⁹ [Traffic Commissioners 2019 report](#)

¹⁰ For example, we would not expect a large proportion of the rigid HGV operators to consider LSTs given the nature of their use and would be largely overestimating the costs.

¹¹ <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/occupation4digitsoc2010ashtable14>

(SOC code 1161) and ‘transport clerks’ (SOC code 4134) to estimate these. Combining the hourly pay, the non-wage labour uplift (NWLU) of 26% as specified in TAG Unit A4.1¹², and hours worked provides an average day cost of £289. The hours worked per day is calculated by the weekly hours divided by 5. This is summarised in the table below.

Employee type	Hourly pay (median)	Weekly hours (median)	NWLU	Day pay
Managers and directors in transport and distribution (SOC 1161)	£17.16	40	26%	£172.97
Transport clerks (SOC 4134)	£11.87	38.8		£116.06

86. The average day cost is then applied per organisation using the assumption of half a day’s time taken. We understand there might be uncertainty around this, so we have included a question below to determine if there is a better estimate.

Number of operators in scope	62,415
Time taken for each operator	0.5 days
Day cost	£289

Transition costs (ii) LST viability assessment

87. In the modelling, all operators with a restricted or standard national license in the UK would have made an initial review of the legislation changes. However, once operators have understood the change, may decide to seek further information regarding the change and decide whether they are applicable within their business. We have referred to these as the ‘Tier 2’ costs within this impact assessment.

88. It is expected that most operators who operate the current standard 13.6m trailers and rigid HGVs with a drawbar combination would do a Tier 2 assessment to discover if LSTs are viable for their business or not. While there are no specific numbers on these number of operators, we have assumed that these would represent 50% of those on standard national licenses and 10% on restricted licenses. Given this, we can estimate the number of operators who would incur costs in Tier 2. At this stage, it is expected that the number of operators would be overestimating the operators who would review the viability of LSTs as this is likely to apply to those currently using articulated HGVs only. We will seek clarification during the consultation stage for use in the final impact assessment.

89. Once we have identified the number of operators in scope for Tier 2 review, the estimate of the total days’ worth of work involved with this assessment. Given the detail around the change and the likely regulation options, it is assumed this to take around 5 days to complete. Given this is an estimate at this stage, we have included this as a consultation question to gather feedback from operators. This is made up of the following activities:

- a. Review and understand the legislation change – a more detailed assessment than the initial Tier 1 review.
- b. Identifying the business needs for using LSTs going forward – assessing those business areas where the load capacity is reached but are running underweight. This would also feature understanding whether the facilities of these journeys will be able to accommodate LSTs.

¹² <https://www.gov.uk/government/publications/tag-unit-a4-1-social-impact-appraisal>

- c. Understanding the specifications of the trailers – understanding specifics around the trailer design, such as the different steering axle options and their behaviours, and the potential costs and benefits of each trailer in their fleet.

Number of operators in scope	16,618
Time taken for each operator	5 days
Day cost	£289

Question 4: Is the time taken in the Tier 1 and Tier 2 review reflective of the expected time taken to carry out these tasks? If not, what would be a reasonable estimate for the number of Tier 1 and Tier 2 days? (note, this is 0.5 for Tier 1, and 5 for Tier 2.)

Question 5: Is the number of operators in scope for each Tier 1 and Tier 2 review reflective of the actual number of operators in scope? If not, how many operators would be expected to review in each Tier? (note, this is 62,415 in Tier 1, and 16,618 in Tier 2.)

Question 6: What employees do you expect to be involved with the review of the regulation? How many hours would you expect each individual in your organisation to take to review the options under Tier 1 and Tier 2? (e.g. how many hours for each employee (e.g. director, transport manager, admin staff))

Question 7: Do you foresee any further familiarisation costs necessary to accommodate future increased amounts of LSTs? If so, how long would you expect these to last for and at what cost?

Ongoing costs

Ongoing costs (i) Trailer Replacement Costs

90. The key ongoing costs experienced by operators relate to the additional cost of replacing a standard trailer with an LST variant which needs to be considered in a policy leading to the shift towards new trailers. The costs represent the marginal increase in purchasing a trailer which is above the existing cost for a standard trailer. From the VSO data, we know the first registration date of each trailer and therefore the age of the trailers in the current trial. This allows the modelling of the trial LSTs being replaced with new trailers once they reach 10 years of age. In the further uptake resulting in this option, it is assumed once a new trailer reaches 10 years of age it is also replaced with a new trailer. For example, a new trailer bought in 2021 will last for 10 years and be replaced in 2032. We have also assumed that there is no second-hand market currently for LSTs and that any additional trailers bought will be at the full market value. Naturally it is expected a second-hand market to become more prominent, especially for the smaller operators but given this will be a price transfer from one operator to another, at the aggregate level it would have no effect. The average life expectancy will therefore allow the modelling of the expected purchase of new trailers to model the replacement costs of new trailers.
91. These costs have been provided to the Department for two different variants: the cost for a 14.6 metre trailer and a 15.65 metre trailer which are now increasingly common. As the trial continued according to Risk Solutions, the 15.65 metre trailer with a single self-steer axle presented the best value for money for most operators and has become the prominent LST used, however the smaller variant is still used by some where access requirements remain limited.
92. These costs are presented in the table below as averages as the data is commercially sensitive. These numbers of trailers in each category (as of 30th June 2020) are provided in the table below:

Length of trailer	Number of trailers on live trial use	Percentage of total
14.6 metres	287	11%
15.65 metres	2,278	89%
Total	2,565	100%

Length of trailer	Average marginal cost to purchase	Range of values	Average marginal cost (2019 prices)
14.6 metres	£2,500 (2010 prices)	£1,000 - £3,000	£3,250
15.65 metres	£7,500 (2016 prices)	£5,200 - £8,600	£8,186

93. The costs have been weighted according to the VSO information from the VCA on the numbers of trailers in each category, and at this stage we have assumed that this split is representative of the future. However, there have been observations that demand for licenses for the shorter LST length of 14.6m has been reducing, and therefore we are seeking views from operators as part of this consultation.

Question 8: What proportion of LSTs would you expect to be using in your fleet that are older than 10 years of age? How long would you expect to continue using these beyond 10 years?

Question 9: How long would you considering owning a new trailer for? Would you expect to sell this on the second-hand market or scrap the trailer at the end of this period?

Question 10: If you were to consider purchasing a second-hand trailer, how many years would you expect to continue using it for?

Question 11: If you own LSTs of each length (up to 14.6m and 15.65m), how many more of each length would you consider buying?

94. Therefore, with the number of LST trailers on the road obtained from the Scaling Model, and those in each year which are replaced when they reach 10 years of age, the total cost per year can be calculated to represent the business cost of purchasing new LST trailers.

95. These costs are based upon the current costs of LST trailers, however these would be expected to change over time as they enter circulation. On the supply side, permitting wider circulation will allow manufacturing processes to change and be more amenable to producing LSTs. There may also be further competition in the market which may decrease the marginal prices to nearer the standard trailer prices. However, this is offset by the potential demand side impacts, as demand rises with inelastic supply, short term prices may rise to reflect the rationing of the current stock of trailers. Given this uncertainty, we have included this in the sensitivity scenarios and used the current prices in the best estimate and will seek to review the impact of this in more depth at the final stage.

Costs associated with regulation

Ongoing costs (ii) Routing requirements

96. When an operator is planning their upcoming business needs, the Department would reasonably expect them to be reviewing whether the routes used for both current and upcoming business are suitable for travelling on, and in the short term, whether roadworks may adversely affect planned routes and deciding on more appropriate routes. This is emphasised through having to carry out risk assessments of routes under this regulatory option. Given the potential impacts surrounding the LSTs, the Department would expect operators to take more time to assess the routes than for standard trailers given the current design of the trailers and the larger tail swing, which comes as an additional cost to business. The additional costs that operators would incur is the additional route planning and the resulting route changes for LSTs. The form this planning might take would vary depending on the size of the LST fleet and the repetitiveness of the operational patterns. Further to this, there would be some form of risk assessment made which enables an auditable history of any risks that this risk poses. Similarly, where there is feedback required from drivers regarding the routes, this is done so and captured within these costs.
97. Similarly, it is expected that there would be some compliance checks in place by operators to understand whether the roads or routes used by drivers of LSTs since the regulatory change were in fact in line with those planned and approved in advance and were compliant with the regulation. This would apply to those routes that were used under the trial where a risk assessment would be needed and future compliance checks undertaken.
98. Under these requirements in the lighter regulation option, we have made an assessment based on the average LST fleet size of operators during the trial and the average time spent per LST each week in carrying out these checks to get an estimate of these costs in a given year. When estimating these costs, an assessment was made on the number of hours taken by different individuals within the business to assess the cost in doing so. There would be planning, and risk assessments undertaken, possibly in practice by a Transport Manager, an administrator or driver themselves at an increased time of 10 minutes per week per LST, but with the operator or transport manager being required to sign off new proposed LST route as the proposed regulations place ownership for route planning on the operator. Given the nature of the task, we expect that there would be efficiency gains from route planning, as LSTs may be used on prescribed routes so lower planning is required or route planners will be able to become more efficient in planning routes which avoid known problem areas. This may also be the case for additional LSTs owned by an operator, where the time taken for additional LSTs will be significantly lower. Further to this, these costs would also be reduced given the viability assessment already carried out, as operators would decide to purchase the trailers based on how they would use them. If it is not viable for operators to use them on their main routes then they would not use them, and if it is then lower amounts of continuous route planning is required. These would be the additional cost experienced by operators above that for standard trailers in the baseline, as more thorough route planning would be necessary to ensure the route is suitable for the longer trailer length.
99. The estimated cost for this is based on the employees that would be required to carry out this assessment. It has been assumed in this analysis this will take around 10 minutes of additional time for a driver and a transport manager. Using the 'large goods vehicle driver' (SOC code 1161) and 'managers and directors in transport and distribution' (SOC code 1161) hourly pay and the non-wage labour uplift of 26% allows us to estimate hourly pay of £15.12 and £21.62 respectively. The total cost of £6.12 per week per LST has been calculated in the table below.

Employee	Hourly cost (ASHE)	NWLU	Cost per time taken (10 minutes)
Managers and directors in transport and distribution	£15.12	26%	£3.60
Large goods vehicle driver	£21.62		£2.52

100. Separately, the Department expects the compliance checks to be undertaken by transport managers or owner-operators but take a reduced amount of time compared to planning the routes initially. Overall, given the difference in hours taken for each task and the difference in the wages of the employees carrying out these tasks we have judged these to be around the same cost including any follow-ups to driver feedback based on the routes undertaken. Where the risk assessment costs and feedback on this may be minimal and features in the current planning and compliance costs, we are seeking clarification on this during consultation. Like the points above, there is the expectation that compliance checks would be less frequent than every week and become more efficient over time so keep the time taken low. These estimates have been presented in the table below. To note, some operators may already have advanced IT systems which aid route assessment and compliance, however we haven't analysed this, and we have assumed it would be undertaken if it was advantageous for them to do so (i.e. lower cost than manually reviewing this).

Cost type	Annual cost per LST
Route planning	£318.24
Route compliance	£318.24

Question 12: Do you expect that there would be additional time associated with carrying out the route risk assessments or responding to driver's feedback on routes than already considered for standard trailers? If so, how much longer would you expect this to take?

Ongoing costs (iv) Training requirements

101. Under this option, it is required that operators would provide employees operating LSTs with some training before they begin using the trailer. Based on evidence discovered throughout the trial, most small to medium operators were providing high-level training by explaining the different components of the trailers to standard trailers as well as the key risks associated with their use. This often followed by a physical demonstration on a trailer and in most cases a test drive with an experienced driver. In some larger organisations, an internal training structure was developed to provide more detailed classroom learning and demonstrations though in some circumstances this was one topic covered as part of a more general training session.

102. The costs associated with training present in two different variations, which have been described in more detail in the following paragraphs:

- a. The cost to the business of providing the course
- b. The cost of the driver's time while attending the training

103. It was advised by Risk Solutions that based on company information submitted by operators, the training across operators has amounted to around half a day's work and most businesses will choose to do this internally. Based on the hours of those providing the training course, which is assumed to be a transport manager or owner/director and separate from the lost driver time, an estimated cost of £145 based on the opportunity cost of their working time. We are then able to calculate the total cost to the business by multiplying this cost by the number of drivers that would require training to understand the

total costs to the business. For this stage, it is assumed that the number of drivers is the same as the LSTs in operation and that this training will be carried out on a one to one basis, though we seek to clarify this during consultation. There may be a further cost to a business in identifying whether to provide an in-house training course or seek an external company to provide this. We have not monetised this cost and will include this in the final stage.

Question 13: Would you expect to train drivers on a group-basis in one go, or one a one-to-one basis? If on a group-basis, how many would you train at one time?

104. There are also the opportunity costs associated to the business through the driver not being able to carry out their normal role and therefore reducing the amount of revenue for the business. These are applicable to all the drivers who need to attend the training course in order to be qualified to operate an LST. These costs have been calculated by using the HGV driver's Value of Time provided by the Transport Analysis Guidance (TAG) to provide the cost of a driver's time per hour during work, with the additional non-wage labour uplift (NWLU) of 26%. The number of hours a driver is working by assuming the maximum number of hours given by the EU working time directive divided by 5, the average working days per week. These values are provided in the table below. Within these costs, the cost of the trainer hasn't been captured as this was captured in the trainers cost in the paragraph above.

Cost description	Value
Average time cost of training employees	£200
Driver Value of Time	£15.77
Driver cost including NWLU	£19.87
Average driver working hours per day	9.6
Total cost of a day	£190.75

Question 14: If you choose to operate LSTs will you have to provide further training to existing employees for them to be able to operate the LSTs? If so, at what cost per employee?

Question 15: Do you anticipate that you would have to provide future training to employees under this option? If so, what would you expect the cost of this to be per employee?

Question 16: How many drivers would you expect to train in comparison to the number of trailers in your fleet? I.e. what ratio of drivers to trailers would you use.

Question 17: Is the assumption on the loss of business time doubling the training cost follow your expectations? If not, how much more than the training would you expect this to be?

Question 18: Is the assumption on each driver obtaining one on one training suitable? If not, how many drivers would you expect to train in one go in your business?

Non-monetised Costs

Non-monetised costs (i) Accident reporting

105. Under this option there would be a requirement for operators to report any accidents which result in injury (on public or private land) or damage (when on a public highway) to the Department. The reporting of these would be expected to take a moderate amount of time across a range of individuals in the business to provide the necessary information to the Department to understand why the accident

had occurred. There would also be a further cost to business through reporting all accidents where damage is caused for a similar purpose.

106. We have not been able to estimate the amount of time taken to carry out these reports, so we have been unable to monetise this at this stage. This is due to further internal work necessary to develop the framework for reporting these accidents. A further justification at this stage for not monetising these costs is the uncertainty on what the estimated number of accidents could be from the introduction of LSTs. Currently, this could be estimated based on extrapolating the trial observations, however it is uncertain whether this is reflective of non-trial conditions and therefore future projection of accidents. It is anticipated the regulation under this option will seek to minimise the potential increases in road safety risk and the Department will continue to monitor the impact on accident rates on an ongoing basis to understand the impacts. It would therefore be inaccurate to estimate the number of reports that is expected to be filed over the appraisal period for each accident type and severity to understand the costs to businesses. We hope to clarify our understanding on both the reporting approach and the estimation on accident rates for use within the final stage impact assessment.

Non-monetised costs (ii) Licensing requirements

107. Where an operator identifies that operating LSTs would be of a benefit to their business the operator will be required to apply to the traffic commissioner for authority to operate LSTs. In making such an application operator will have to pay an application fee to the Office of the Traffic Commissioner (OTC) to vary their license. Whilst most operators, following the understanding applied in the viability assessment cost, would understand their own business requirements before deciding the number of LSTs to purchase for their business, there is some uncertainty around this. It is for this reasoning we have decided to not monetise the costs associated with this at this stage, but we are seeking clarification on these uncertainties during consultation.

108. Aside from the initial application fee for operators (£257) to vary their license, there is also the time element involved with writing, reviewing and submitting the application. To minimise the risk of double counting the time costs, this is separated from the viability assessment, as the time taken to apply for variation after deciding how many LSTs is distinctly different. This is likely to take a range of people in the business to first draft the application for the number of LSTs they wish to operate and then for this to be reviewed within the business before submitting the application. It is anticipated this would take several hours among an office administrator to draft the application and then be reviewed by a manager within the business. It is assumed this to be around half a day's work across the business at a cost of £145 to each new operator over the appraisal period, though we are seeking responses during consultation on how many hours hauliers would expect this to take.

Question 19: Would you seek to vary your license again if you saw distinct business benefits from your initial experience of using LSTs? If so, when would you expect to re-apply for a variation? (i.e. the number of years)

Question 20: Which employees would be expected to be involved in this work? How many hours would it take for each of these to draft and review the license application before submitting? (i.e. we are looking for the number of hours for each employee).

109. When hauliers make an application to vary their operator's license they are required to advertise the proposed variation in the local newspaper(s) for the location(s) of the operating base(s) where the increased number of trailers it is proposed will be operating out of to make residents aware. The costs

of purchasing a slot in the newspaper to advertise these changes is a cost to the business if they decide to utilise LSTs as part of their fleet. Based on internal evidence of a similar notice placed regarding recruiting new Traffic Commissioners, these costs are estimated to be on average £500, but this varied across newspapers and are dependent on the size of the advert. We have sought any improvement on this estimate for use in the final stage but will be applied to the number of operators deciding to use LSTs in further costing work. There would also be a time cost in preparing the advert which we would expect to cost around £30 in opportunity cost of other activities by administrative staff.

110. These one-off costs per trailer are summarised in the table below:

Cost type	Cost per operator
Licensing with the OTC	£257
Enforcement costs	£100
Advertisement costs	£500
Time costs for applying and reviewing OTC application	£200
Time costs for preparing advert	£30

Non-monetised costs (iii) Adapting freight infrastructure

111. An additional cost that could be incurred to businesses because of this regulatory change would be the costs associated with adapting existing freight infrastructure to accommodate the growing number of LSTs being used. The freight infrastructure that might need to be considered would be those around distribution centres, industrial estates, testing facilities and any other facilities that an LST might interact with. The costs would be incurred by the business who owns the infrastructure to make the sites more accessible to the growing number of LSTs when standard articulated HGV are gradually being replaced.

112. These costs are also interrelated with the uptake that we forecast in the scaling model, as it could be argued that if infrastructure is more accommodating to LSTs then there are fewer barriers to owning and operating one which will increase the demand for LSTs. This is the same as described in the 'B' uptake scenario in the scaling model section of this IA, but we have omitted the demand changes resulting from this, and therefore it is prudent to do the same with the costs until the necessary evidence can be provided for this. Furthermore, these costs are also non-monetised as these are likely to be a commercial decision by the owners of infrastructure. Improvements to adapt existing infrastructure would only be done if there is sufficient demand for owners to do so and there is a profitable reason for them doing so, which one could argue is outside the scope of an indirect cost associated with this regulatory change as it is a secondary order effect by others in the industry.

113. Due to the broad definition of freight infrastructure, further work would be required to identify the number of sites and the potential costs of upgrading these to capture these within the impact assessment, which is disproportional at this stage. Risk Solutions carried out research with operators who have adapted their infrastructure during 2019 which will be covered in the 2019 Annual Report, released late 2020 which will allow for a more accurate discussion of the potential costs. Subject to advice from the Better Regulation Unit and the Regulatory Policy Committee, any estimated would be included at the final stage.

Benefits

114. Several benefits have been modelled for this analysis which are proportional to the consultation stage of this impact assessment. Subject to sufficient feedback from the consultation questions asked in this section this will allow the Department to strengthen the modelling for the final stage.

Benefits (i) Reduction in standard trailer miles

115. The benefits of LSTs is generated through calculating the number of miles saved compared to the situation where LSTs are able to continue to operate until the end of the trial. When they reach the maximum lifecycle of an LST, they are assumed to be replaced by a standard trailer and therefore comparing this option against the number of trailers operating under the trial until it ends. The scaling model mentioned above uses the trial data, survey data and CSRGT data to forecast the distance savings throughout the appraisal period. The distance savings capture those already being saved from the LSTs on the trial until its conclusion as per the description in Option 0.

116. Using these reduction in miles projections received from the scaling model, this permits the calculation of the specific benefits highlighted in the following benefits sections (ii) to (viii). Further to the reduction in miles by standard trailers, Risk Solutions have also provided forecasts on the savings from pollutants such as Carbon Dioxide, Nitrous Oxide and Particulate Matter based on routing data and modelling using detailed LST journey and loading information gathered on the trial. These emissions are scaled and then forecast to inform the Environmental benefits calculations, which are more accurate than using the standard Department produced emissions benefits which are based on average fleet projections and loading factors.

Benefits based on DfT's Marginal External Costs (MECs) Methodology

117. The following benefits (ii) to (v) are based on the Departments MECs methodology as outlined in [TAG Unit A5.4](#). The MECs method calculates the external cost (or benefit) of an additional (removal) mile of vehicle traffic for use within appraisal. The values for this have been modelled by the Department's National Transport Model (NTM) and subject to rigorous quality assurance and approvals process before the values are updated and published for use within appraisal by practitioners. The values are provided in the table below for each 5-year period. These have been linearly interpolated to find intermediary year benefits.

MEC Values (pence/mile, 2019 prices)	2020	2025	2030	2035	2040
Congestion	62.89	71.58	86.88	99.97	120.15
Infrastructure	17.38	18.32	20.02	22.05	24.42
Noise	7.74	8.31	9.07	9.88	10.86
Indirect Taxation	-35.32	-35.88	-37.21	-38.08	-37.31

Benefits (ii) Congestion

118. The removal of HGV traffic leads to a reduced congestion impact on all other vehicles given the decreased number of vehicles using the road and the resulting amount of delay experienced by all vehicles using the road. This presents a benefit to wider society as there is reduced amounts of delay being experienced by all other individuals using the road.

119. These reductions in journey times are modelled through the NTM and provides the monetised benefit through utilising the values of travel time to convert to a monetary value for use within appraisal. Therefore, the benefits presented within this impact assessment represent the total decongestion benefits associated with the resulting reduction in miles travelled by standard Articulated vehicles on all other vehicles using the road network. It is expected that some of these benefits would accrue directly to hauliers as a business benefit rather than solely to society, but given the complexity in estimating these benefits, it is assumed these are all societal benefits. This will re-visited during the final stage and an assessment sought.

Benefits (iii) Infrastructure impact

120. The impacts on the road condition and general wear and tear of the roads is considered as the infrastructure impacts within the Department and this analysis. These values derived using the MECs approach look at the impact of an additional unit of traffic on the overall infrastructure and the associated expenditure necessary to maintain the road network. The reduction in the amount of traffic leads to a benefit in terms of lower necessity for infrastructure expenditure associated with the reduction in traffic levels.

121. The benefit therefore reflects the reduced expenditure necessary to maintain the existing standard of the road network. The infrastructure MECs have assumed that lorries are fully laden, and therefore reduces the need to model the increased weight of LSTs carrying more goods. Given the objective of LSTs is to increase the capacity of trailers for lighter goods, those operators that utilise LSTs will see higher average weight capacity per journey. Therefore, it is assumed that LSTs will have the same average weight as other articulated lorries and any extra weight would be mitigated by the self-steering features available on most trailers, as the impact on road wear is lower whilst cornering compared to conventional trailers. The journeys by standard trailers being reduced are likely to be doing so at lower weights than assumed in the modelling (given volumes are maximised before the weight is) and therefore we would be overestimating the benefits as the journeys removed are not 44 tonnes in weight. We will investigate modelling this further for the final stage impact assessment.

Benefits (iv) Noise impact

122. The impacts associated with road traffic are quantified using a common methodology outlined in TAG, using an established and robust methodology to appraise the impacts. This methodology is employed by the MECs method to determine the impact of an additional unit of traffic on the road network. These values are calculated and are dependent on a variety of factors including the vehicle weight, the design, the number of axles, the receptor population and the time of day.

123. The monetary values for noise are calculated on a per mile basis to allow for a proportionate application when looking at a reduction in miles and the associated benefits. The lower number of miles travelled by articulated lorries due to the continued use of LSTs against the baseline will lead to an increasing amount of benefits to the wider society and are calculated to reflect the increasing use of LSTs throughout the appraisal period. As mentioned for infrastructure, LSTs that are replacing standard trailers would be doing so at higher weights and therefore would likely increase the noise generated from their usage, however would be in line with the maximum weight level of 44 tonnes assumed by the noise benefit modelling, so we do not need to account for this. This may be overestimating the benefits from reducing standard trailer movements if they are doing so at lower weight, and this will be investigated how best to capture this within the modelling for the final stage of this analysis.

Benefits (v) Indirect Taxation impact

124. The Government receives taxation revenue from fuel duty which forms part of the broad transport budget. The impact of this is calculated through the MECs method and is usually represented as a negative benefit in the Department's analysis of indirect taxation revenue. In this analysis, this will be presented as a non-business cost and will be captured in the total cost element of the NPV calculation. This cost is a transfer between business and Government and have ensured that these costs are only captured once.
125. The reduction in miles associated with the increasing use of LSTs leads to a lower amount of standard trailer miles being travelled. Calculating this with the rates provided by the MECs method leads to a reduction in the indirect taxation revenue for the wider Government.

Environmental Benefits

Benefits (vi) Environment

126. The removal of HGV traffic leads to a benefit for the wider environment due to improvements in air quality and the reduction in greenhouse gases. The introduction and proposed increased uptake in LSTs leads to less standard trailer miles being travelled and therefore lower amounts of Carbon Dioxide (or Greenhouse Gases), Nitrous Oxide and Particulate Matter emissions which are damaging to the environment and those in the immediate vicinity. Throughout the trial, freight operators using LSTs were required to report on the number of miles saved, and through modelling, Risk Solutions have provided the Department with the emissions savings as part of the trial programme¹³. The analysis carried out by Risk Solutions uses an assumption for the fleet for Euro V engines and provided future projections of emissions based on the fleet composition. More detailed modelling will be carried out to incorporate the increased use of Euro VI engines and used within the final stage impact assessment, which is expected to reduce the benefits around Nitrous Oxides and Particulate Matter emissions. Furthermore, some anecdotal evidence from manufacturers state that the self-steer systems reduce the tyre scrub which would reduce the Particulate Matter emissions resulting from tyre wear, however there is little evidence publicly available to support this and therefore we have not captured this.
127. Given the emissions, the impacts can be monetised following the standard TAG procedures. For Carbon Dioxide, the tonnes of emissions saved can be converted using the CO₂ equivalent non-traded prices to provide the monetary value in pounds. Similar for Nitrous Oxide and Particulate Matter, these can be converted to their monetary equivalents using the damage cost approach as prescribed by TAG Unit A3, using the road transport national value to estimate the total impacts from a reduction in these air quality-related emissions.
128. The value placed on changes in greenhouse gas (GHG) emissions is currently under review, now the UK has increased its domestic and international ambitions. Accordingly, current central carbon values are likely to undervalue GHG emissions, though the scale of undervaluation is still unclear. The potential impact of placing a higher value on GHG emissions can be illustrated by using the existing high carbon values series, in addition to the prescribed central values. HMG is planning to review the carbon values during 2020.

¹³ Further information on the emissions modelling can be [found here](#).

129. Following the interim recommendation outlined above, a further sensitivity using the higher series of the non-traded CO2 equivalent costs has been provided to estimate the further impacts from greenhouse gas emissions savings. Based on this sensitivity, for this option there would be a 50% increase in the carbon dioxide reduction benefits, which increases the NPV in the best estimate case by 3.5% to £1,138.39m (2019 prices, 2021 PV).

Benefits (vii) Fuel Saving

130. Associated with the reduction in the amount of HGV miles travelled, there is a direct benefit to businesses around the reduction in the expenditure on fuel. The total amount of fuel consumption associated with the reduction of HGV miles is not provided by the operators to Risk Solutions, but a conversion can be made from the modelled CO2 savings. Given the CO2 savings from the model, the estimated litres of fuel saved can be calculated using conversion factors provided in the TAG Data Book which calculate the number of litres associated with the emissions generated throughout the forecast period. It has been assumed for this benefit that the fuel consumption rates for LSTs are the same as those incurred by standard articulated trailers, but this might not be the case with increased cargo weight and are seeking information through consultation. This was considered under the trial, and the feedback indicated marginal improvements which is offset by other costs associated with LSTs. It was indicated that robust estimates could be sought from strict head-to-head tests between LSTs and standard trailers under controlled conditions.

131. To ensure this is not double counting the costs associated with fuel duty, this calculation is based on the resource element only, the indirect tax calculation calculates the cost associated to wider government through lower taxation revenue.

<p>Question 21: Are the observed average fuel consumption rates from LSTs the same as standard articulated vehicle trailers for a similar cargo weight? If not, how much do LSTs affect these rates?</p>

Benefits based on the Transport Engineer Operator Costs report

132. The following on-going benefits have currently been indicatively monetised based on the costs outlined in the Transport Engineer Operator Costs report, however questions have been included in the call-out box below to get further clarification. These benefits are savings related to: labour, fuel, tyres, maintenance and repairs, insurance, Vehicle Excise Duty and Road User Licensing. For most of these benefits, this takes fixed annual costs and converted them to variable costs to provide a proxy for the potential benefits to business. This is explained in further detail below. This might present some inaccuracy and uncertainty given the costs are often not perceived in this way. Alternative options will be investigated to model these to provide a more accurate representation of the benefits derived from fixed cost savings at a later stage.

133. The calculated benefits based on the miles travelled by the average articulated vehicle and assumed that LSTs have the same benefits as standard trailers which we are also seeking clarification on.

Benefits (viii) Labour Saving

134. Following the reduction in the number of HGV miles because of the introduction of LSTs, there will also be an associated decrease in the number of drivers required to move the same level of goods. This presents an indirect cost saving to business due to the lower number of drivers necessary to move the goods, which coupled with the driver shortage observed in the industry will lead to lower pressure in recruiting and replacing drivers. Given this shortage, the benefits represent a productivity improvement for drivers as they can be re-distributed to other tasks.

135. The costs for a reduction in labour have been estimated by the Department which is based on the estimated yearly salary and mileage information provided by the Transport Engineer report. This calculates the cost of a HGV driver by taking the salary that is paid to the driver themselves and including the non-wage components to calculate the total salary which includes the non-salary components such as national insurance. This may be an underestimate as most drivers will supplement their salary with overtime payments, as these are not guaranteed we have not including these in the analysis. These can then be divided by the average annual mileage to arrive at the below rate of £0.55 per mile. Details on the specific values are provided in the table below. These values will be used in the final stage IA, subject to any comments from the consultation process.

Metric	Value
HGV driver salary per year	£37,184
Annual vehicle miles travelled	85,000
HGV driver salary per vehicle mile	£0.44

136. Given the reported driver shortage outlined in the rationale for government intervention section, any reduction in the number of drivers required for current work provides the potential for businesses to utilise them elsewhere and increase their productivity. It is expected that most operators as a would re-distribute their drivers internally within their business or fill other vacancies to carry out more movement of freight and therefore generate revenue for the industry. It is assumed that given the increase in productivity, the business will at least receive increases in revenue according to the salary they would pay their drivers, representing an increase in the revenue based on the extra capacity of the business.

Question 22: Are the employee costs presented by the Transport Engineer report reflective of your average employee costs (salaries of £37,184)? If not, how much different is this?

Question 23: Are the annual mileage per driver of 85,000 presented in the Transport Engineer report reflective of your average driver mileage? If not, how much different is this?

Question 24: Are current LST operatives paid a premium for operating LST trailers? Do you plan on changing this if LST operation continues/grows?

Question 25: Are the costs provided by the Transport Engineer report representative of the standard trailer annual running costs? These are presented in the table below.

Question 26: Are the annual running costs the same for LSTs as the current standard trailers (see Question 8)? If not, by what percentage are these different?

Cost type	Cost per year	Miles per year	Cost per mile
Tyre savings	£1,567	85,000	£0.02
Repairs and maintenance	£5,041		£0.06

Vehicle Excise Duty and Road User Licensing	£1,200		£0.01
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Benefits (ix) Tyre savings

137. Due to the reduction in travel associated with increasing the number of LSTs in general circulation there are net benefits associated with less tyre wear and replacements. The annual costs of tyres have been obtained from the Transport Engineer report and has been calculated on a per mile basis for the purposes of this impact assessment (see below). The benefits represented therefore show the net benefit from reducing standard trailer miles but increasing the LST miles.

138. At this stage it has been assumed that LST tyre costs are equal to the tyre costs for a standard trailer, however this might not be the case given there have been observations of lower tyre scrub associated with the steering axle systems employed by LSTs which would reduce the frequency of tyre replacements. Given this uncertainty, we seek clarification on this during consultation.

Question 27: Have you experienced lower tyre costs associated with operating LSTs due to the reduced tyre scrub from the steering axle systems? If so, how much cheaper would you expect this to be per trailer each year? (i.e. what percent were they different)

Benefits (x) Repairs and maintenance savings

139. Similarly, the reduction in miles travelled leads to fewer repair and maintenance costs due to less vehicles on the road leading to lower wear and tear on vehicles, representing a cost saving for operators. These are calculated on a per mile basis and applied to the miles saved from the trial, which assumes the same repairs and maintenance costs apply for LST trailers. It is understood that there may be differentials in maintenance costs associated with LSTs due to their self-steer systems but are unable to quantify this at this stage. We are seeking information regarding this below.

Question 28: Have you experienced increased/decreased repair and maintenance costs while using LSTs with self-steer systems? If so, how much was this increase?

Benefits (xi) Vehicle excise duty and road user levy

140. Vehicle excise duty and road user levies are payable by freight operators to contribute towards the cost of building and maintaining the roads in the UK as regular business users. These costs are paid per vehicle in operation and given the introduction of LSTs leads to a reduction of vehicle use, it is assumed there are savings to be gained from paying less of these taxes. Therefore, taking the average annual costs for these and converting to a per mile basis allows an estimation of the benefits from not paying these taxes when miles are reduced. However, this assumes that there is an overall decrease in the number of trailers used which has been identified throughout the trial¹⁴ where 38% of respondents would reduce their fleet by some degree, and 52% said they would keep their fleet the same.

¹⁴ 2017 Annual Report, Table 36

Non-monetised Benefits

Non-monetised Benefits (i) Accidents reduction

141. The introduction of LSTs would lead to two differentiating impacts on the accident rate, which is discussed in further detail in Annex A. These are accident prevention through the reduction in standard articulated lorry miles, and the changes in the risk of accidents due to having increased numbers of LSTs in operation which are longer than the standard trailer length. The reduction in accident risk could be analysed using the risk rates identified and using the value of prevented fatality to estimate the total impact.
142. The reduction in accident risk could be analysed using the risk rates and values mentioned above, but although the trial has generated data on the accident risk generated from LSTs, it is being considered how best to measure this going forward. The impact from increased LSTs is more complicated and nuanced to model due to the lack of data on the usage, the mitigation measures used, and the post-trial conditions for LSTs which is discussed further in Annex A. The figures presented in Annex A are reflective of the 2018 trial data and make no estimate on the forecast uptake used in the rest of this analysis. Given this is observed trial data, it could also be presenting a false positive in terms of the overall net reduction in accidents given the reduction in distances travelled and the increased risk rates for LSTs.
143. It has been indicated by separate pre-trial work undertaken by Transport Research Laboratory (TRL) that the likely effects of LSTs in the UK would only be marginally higher than existing standard trailers and immeasurable in the current casualty data, but this was based on theoretical designs which have changed throughout the trial. Based on the trial data observed by Risk Solutions, there has been an approximate reduction of 15.2 on all severity casualty accidents per year based on the lower number of miles travelled and the observed LST accident rates during the trial.
144. We have also carried out further exploratory analysis, which is described in Annex A, which outlines if the LST accident rate was 1% higher than standard trailers (as indicated by the TRL research, assuming no special operational management of LSTs), an estimated reduction of around 1.9 all severity casualties per year based on the current miles travelled and risk rates of LSTs and the reduced distance travelled by standard HGVs.
145. Given the ambiguity around some of the assumptions necessary to model the accident and road safety impacts, we have decided not to include this analysis for the consultation stage, and review this after receiving consultation responses for the final stage. By then, we would hope to have greater clarity on the usage and regulation of LSTs in a post-trial world, plus further information on the types of LSTs which will be used going forward. An estimation on the potential impact on safety risk and casualties over the appraisal period could then be included, but not include these impacts in the monetary analysis. Therefore, we are seeking in consultation further information from the questions outlined below.

Question 29: Are there any other factors that we have not mentioned that would change the observed accident rates if we were to allow LSTs to operate outside of trial conditions?

Business Impact Target Calculations

146. Out of the costs and benefits highlighted within this option and described previously, most of these are indirect impacts for use within the BIT calculator. This is since operators won't incur any of the costs and benefits prescribed above without making an active policy decision. The only impact that is direct is the impact of familiarisation costs around the initial legislation reviews by freight operators when the regulation has been changed.
147. Based on the consultation responses to the questions outlined in this document, this will be able to further improve the modelled impacts to strengthen the analysis and provide a more accurate representation on the possible impacts resulting from this option.

Sensitivity Analysis

148. Most of the data used for this analysis has been obtained from robust and well-established sources which provide us with a limited range for sensitivity testing. For the Departmental MECs values, high and low values have been applied for this analysis. There are some further assumptions that we can test for different scenarios, these are the purchase prices of trailers, regulatory costs and the running cost savings expected from LSTs. These are summarised in the table below and explained in further detail in the high and low NPV sections below.

	Central (Best Estimate)	Low NPV	High NPV
Marginal External Costs (MECs)	Central DfT MECs	Low DfT MECs	High DfT MECs
Purchase price of LSTs	Observed market prices	Central plus 20%	Central minus 20%
Regulation and familiarisation costs	Central DfT estimate	Central plus 20%	Central minus 20%
Annual cost savings	Central DfT estimate	Central plus 20%	Central minus 20%

149. Subject to responses on the consultation questions outlined in this assessment, this would allow further sensitivity tests within the analysis to provide wider estimates of potential scenarios

Sensitivity Analysis Low NPV

150. For the low scenario, a reasonable worst-case scenario is presented to understand what an acceptable lower range for the NPV could look like and what drives these changes. This scenario includes the low valuation for the MECs which have been estimated by the Department using the NTM. These are presented below.

MEC Values (pence/mile, 2019 prices)	2020	2025	2030	2035	2040
Congestion	59.76	63.77	70.28	78.94	89.93
Infrastructure	17.37	18.36	20.01	22.05	24.43
Noise	7.81	8.28	9.03	9.89	10.87
Indirect Taxation	-35.22	-35.79	-37.00	-37.87	-37.03

151. Within the analysis, we have been provided market data by Risk Solutions on the marginal purchase price of LSTs above that of standard trailers. This is a key input which allows the determination of the direct costs to business given the uptake of LSTs across the appraisal period. The values obtained by Risk Solutions have come from a range of suppliers and an average value taken, which presents a suitable average value to be used as the best estimate. For the low scenario analysis, we assume that these costs would increase by 20%. The underlying theory behind this could be a pessimistic view of competition in the market for LSTs and due to the excess of demand leading to higher prices in the market to purchase LSTs. This would pass through in the analysis to show higher direct costs to business.

152. A further sensitivity is to adjust the regulation costs borne on businesses by the regulation options, familiarisation and annual cost savings from running LSTs. Like the purchase costs, these have been increased by 20% to present a worst-case scenario and lowered the annual cost savings by 20% to understand the range of impacts under this option.

Sensitivity Analysis High NPV

153. In the high scenario, an optimistic case where the benefits realised are higher and the costs borne by operators are lower has been presented. On the benefits, the NTM produces outputs which represent a reasonably high scenario for the valuation of the MECs, which is explained in the TAG guidance. These are presented below.

MEC Values (pence/mile, 2019 prices)	2020	2025	2030	2035	2040
Congestion	62.81	71.73	88.23	104.75	140.86
Infrastructure	16.62	17.37	18.36	20.00	22.05
Noise	7.81	8.28	9.03	9.88	10.86
Indirect Taxation	-35.28	-35.93	-37.39	-38.16	-37.48

154. Conversely to the low scenario, a reduction in the trailer costs of 20% has been assumed based on theory which suggests that economies of scale and competition in the production of LSTs is reached which lower the supply costs to businesses which reduces the direct costs. The regulation and familiarisation costs have 20% deducted and the annual cost savings have 20% added to identify a reasonable upper bound on the valuation.

Wider Impacts

155. Currently no quantitative analysis has been undertaken to assess the possible impacts for the small and micro business assessment (SAMBA) as while we have data on the current operator sizes, we are not certain on the uptake of the regulation post-trial. We have included questions below which will allow us to estimate the quantitative impacts for the final stage impact assessment.

Question 30: How many LSTs do operators with less than 10 employees intend to use in the future?

Question 31: How many LSTs do operators with less than 50 employees intend to use in the future?

Question 32: Are either of these operators (with less than 50 employees) subject to higher costs than those which have been assessed in this consultation document?

156. The Business Population estimates 2019¹⁵ provides a breakdown on the number of businesses, employees and turnover of businesses by different sizes in the freight transport industry. The breakdown of businesses by the number of employees is provided in the table below. It shows that the number of small and micro businesses in the industry are around 97% of the total amount, which emphasises the importance of ensuring this permissive regulation change can be accessed by the entire market. Even though large business represents 0.3% of all businesses, this corresponds to nearly 32% of the industries revenues.

Size of business	Number of businesses	Business share (%)	Turnover (£ million)	Turnover share (%)
Micro (1 – 9 employees)	18,530	83.0	6,111	20.1
Small (10 – 49 employees)	3,140	14.1	7,701	25.3
Medium (50 – 249 employees)	590	2.6	7,013	23.1
Large (250 or more employees)	70	0.3	9,565	31.5
Total	22,330	100	30,390	100

157. As the trial has been running since January 2012, Risk Solutions have been collecting data on the size of businesses that are using LSTs under the current trial regime (based on the number of drivers in the business¹⁶), which are provided in their annual report¹⁷ and summarised below. As shown below, although the industry is made up of mostly small and micro businesses, this only represents 42% of the total share of companies within the trial and around 13% of the trailers. This suggests that currently there could be a barrier to small and micro businesses in using LSTs as the trial is mainly made up of medium and large companies. The trial currently overrepresents the small businesses and underrepresents the micro operators, which may impact future take-up of these businesses. Some of the reasons for this could be:

- Larger businesses tend to be in a better position to trial new technologies as they have sufficient revenue and operations to fall back should the benefits not be realised;
- Smaller businesses tend to be more risk averse and may be waiting for a formal regulatory change before they commit to purchasing and using LSTs;
- The data collection and submission may be too burdensome on small and micro operators which deters them from using;
- Larger business are more likely to carry higher capacities of goods through regular route(s) to yield the business savings associated with operating LSTs;
- The cost of new LSTs is too expensive to warrant joining the trial and small/micro business may prefer to buy them second-hand, where the market is relatively underdeveloped.

Size of business (by number of drivers)	Number of trailers	Trailer share (%)	Number of companies	Companies share (%)
Micro (1 – 9 employees)	47	2.1%	24	11.2%
Small (10 – 49 employees)	248	10.8%	66	30.8%
Medium (50 – 249 employees)	752	32.8%	79	36.9%
Large (250 or more employees)	1,211	52.9%	36	16.8%
No data	33	1.4%	9	4.2%
Total	2,291	100.0%	214	100.0%

¹⁵ Table 7, Code 495, <https://www.gov.uk/government/statistics/business-population-estimates-2019>

¹⁶ This differs from the BEIS estimates which use all employees. Under the trial it was judged that drivers provides a more accurate representation of operator size, however comparative headcounts to the BEIS estimates will be provided in the final stage impact assessment.

¹⁷ Calculations based on LSTs and operators submitting data under the trial, as provided in the 2018 Annual Report

158. Based on the proposed regulation under this option, it wouldn't disadvantage small or micro businesses any further, as these businesses will already be carrying out these activities on their current fleet. The main burden from the trial was the collection and submission of data which may have been preventing take-up by these businesses, and this is relaxed somewhat under this option. There are minimal data collection requirements proposed in the regulation and this relates only to the operator acting to ensure compliance, it is thought that this will vastly reduce the administrative barriers surrounding the operation of LSTs.
159. Although the regulation doesn't intentionally disadvantage small and micro businesses, medium and large operators may be better positioned to take advantage of the permissive regulations proposed under the options presented. This is because they have more flexibility in the market and can adapt fairly quickly to new regulation changes, while it might take smaller business more time to adapt to their new market. However, through time, it is anticipated that smaller hauliers would be able to make efficient use of LSTs in the same way that larger operations currently are.
160. Based on the characteristics of smaller operations, they have a higher tendency to own second-hand trailers and run them for longer than those in larger operations. This would mean that the business costs associated with purchasing trailers is likely to be lower than outlined in the main cost analysis. While this is not specifically modelled the impact of a second-hand market, it will be considered throughout consultation and look to obtain data on the proportion of small and micro businesses utilising the second-hand market.

Question 33: If you are a small/micro business, how likely are you to buy a second-hand trailer over a brand new trailer? Please provide a percentage where possible.

Question 34: If you are likely to purchase a second-hand trailer, what age of trailer would you expect to purchase?

Question 35: How much is purchasing a second-hand trailer likely to reduce purchasing costs by? Please provide an expected percentage saving in costs.

161. To conclude, although the regulation under this option doesn't intentionally disadvantage or act as a barrier to small and micro businesses, there may be some elements of operating an LST which they might struggle with or incur additional costs compared to larger businesses. Where possible, these have been mitigated through the design of the regulatory change, though throughout the consultation the views of small and micro businesses will be sought to provide further clarity of the impacts.

Trade Test

162. Under the requirements of carrying out a trade test as part of the impact assessment process, a short explanation has been undertaken to highlight the possible impacts on the value of imports or exports, impacts on investments and trade flows and that on domestic and foreign businesses. For the first two requirements, the introduction of LSTs under the three options presented in this impact assessment will have no impact on the value or trade and investment flows with other countries.
163. For the final point, the proposed regulatory change does not align with foreign policies and may adversely impact foreign businesses who operate in or from the United Kingdom to other countries. Hauliers that both operate domestically and internationally won't be able to make use of LSTs for international journeys given the differentials in the regulatory regimes, however they could use LSTs for domestic operations. Given this is a deregulatory change, hauliers can choose to operate LSTs and it therefore does not place a regulatory burden on foreign operators or domestic operators continuing business in the UK. Therefore, although this may disproportionately affect foreign hauliers, this would not act as a barrier to trade as business can continue as it does under the current regulatory regime.

Option 2 – Heavier additional regulation

164. The costs and benefits and sensitivity scenarios for this option are mostly the same as those outlined in “Option 1 – Lighter additional regulation” section of this document; where there are differences, these are outlined under the relevant sub-headings below. The summary table for the costs and benefits is provided below. This option has been modelled based on the regulatory Option 2 explained within the regulatory options section of this document.

165. In the forecasting scaling model, we have assumed that the savings resulting from this option would be higher than in Option 1 given the requirement to collect data and submit this data to the police, the Driver and Vehicle Standards Agency (DVSA), the OTC and the traffic commissioner upon request. Conversely to Option 1, the regulatory requirements in this option would be higher and therefore expect to see a lower uptake than Option 1 given this increased burden which affects the number of trailers in operation.

Impact	Type of impact	Direct/Indirect
<u>Costs</u>		
Initial assessment	Business, Transition cost	Direct
Viability assessment	Business, Transition cost	Indirect
Trailer replacement costs	Business, Ongoing cost	Indirect
Regulation costs	Business, Ongoing cost	Indirect
Taxation revenue	Non-Business, Annual cost	Indirect
<u>Benefit</u>		
Fuel saving	Business, Annual benefit	Indirect
Labour saving	Business, Annual benefit	Indirect
Tyre saving	Business, Annual benefit	Indirect
Repairs and maintenance savings	Business, Annual benefit	Indirect
VED and RUL savings	Business, Annual benefit	Indirect
Congestion	Non-Business, Annual benefit	Indirect
Air Quality	Non-Business, Annual benefit	Indirect
Greenhouse Gases	Non-Business, Annual benefit	Indirect
Infrastructure	Non-Business, Annual benefit	Indirect
Noise	Non-Business, Annual benefit	Indirect

Summary

£million, 2019 prices, PV 20 years	Option 2		
	Low	High	Best Estimate
<u>Costs</u>			
Trailer Replacement	187	124	155
Taxation Revenue	2	2	2
Regulation costs	299	199	249
Initial assessment	10	7	9
Viability assessment	28	19	23
Total Costs	525	351	438

<u>Benefits</u>			
Fuel Saving	121	152	127
Labour Saving	234	292	243
Congestion	410	530	506
Air Quality & Greenhouse Gases	133	133	133
Infrastructure	116	116	116
Noise	52	52	52
Tyre saving	10	13	11
Repairs & Maintenance saving	33	41	34
VED and RUL saving	8	10	8
Total Benefits	1,117	1,338	1,229
NPV	592	987	792

Costs

Transition costs

166. The transition costs associated with this option are the same as under Option 1. This is given that businesses would still make the same initial assessment of the legislation change and the same number of businesses would make a viability assessment on whether they would replace any businesses with LSTs and how many they would purchase.

Ongoing costs

Ongoing costs (i) Licensing requirements

167. In addition to the initial application fee, time cost and the enforcement fee described in the non-monetised section in Option 1, under this option there would also be an analysis time cost imposed to the DVSA and OTC in respect to analysing LST tracking data where it was called for. This cost would cover any additional burden on these organisations in order to ensure that the operators are complying with the regulation set out by this option, this is expected to cover:

- a. Staff time spent requesting data to be submitted and chasing operators for data where applicable;
- b. Time spent identifying what data should be analysed and analysing the data;
- c. Time spent making recommendations on further investigations at the appropriate level;
- d. Time spent making recommendations to the traffic commissioner where necessary.

168. The costs have been estimated by inferring the number of employees involved, their hours required and their average wage cost per hour, which we have estimated to be £650. This cost is a one-off cost per new LST that is bought in through the forecasting of uptake at the time license application. one-off cost for the lifetime of each trailer. For simplicity at this stage, we have assumed that the trailer does not move depot and there is no second-hand market, both of which increase the frequency that these costs are paid. Greater clarity will be sought during consultation on these aspects.

169. We have therefore added this in as a monetised cost for the regulatory option, however it is understood that there may be some uncertainty around this figure which we are seeking to resolve during consultation.

Question 36: Does the figure of £650, which captures the additional monitoring costs to the OTC and DVSA reflect expectations? If not, what would you expect this cost to be per trailer?

Ongoing costs (ii): Training

170. As described in the regulatory options within this impact assessment, operators would have to carry out internal training of drivers before they are able to operate an LST and undertake an accredited LST course from a CPC provider within their first 5 years of using an LST. Some operators may decide to make use of this but expect that most would require internal and CPC training before operating an LST. Given the ongoing learning requirements, it is assumed that this would feature in a drivers future CPC training and therefore not present additional costs associated with this regulation over future 5-year periods. Similarly, to above, the number of LST-trained drivers would increase with the number of trailers forecasted by the scaling model, so these one-off costs would be applied to the new stock of drivers being trained. For simplicity, the costs of training have been modelled to fall within the first year the driver is operating an LST, and these two costs are presented below:

- a. the cost of providing the initial training – around £145, as explained in Option 1;
- b. the cost of the CPC course – around £400.

171. On the latter cost, this was estimated internally through desk-based research to get an idea of the cost. This involved researching similar modules which are CPC-accredited and deriving the average cost of these.

172. Further to the business costs associated with sending the driver on a training course, there is also the lost revenue associated with the driver not being able to work for that day. The derivation of the costs of this are outlined under option 1, but given the training is expected to be an initial course then a formal CPC course, the total lost days per driver would be 2 days.

Cost description	Value
Cost of a day of driver's time	£190.75
Days lost per driver	2
Total business cost per driver	£381.50

173. The costs of these will be applied to both the stock of existing drivers implied by the LSTs in operation in the first year, plus the additional flow of drivers being trained to operate the LSTs. We are continuing to assume the number of drivers equals the number of LSTs in operation but will update this in line with any information provided by Option 1. It is assumed that the training costs would only be incurred once by an operator, however subsequent training on any future LST designs which come to market or when a driver changes company may occur and will be reviewed for the final stage.

Question 37: Does the cost of a day's training on a CPC-accredited LST module meet your expectation of the cost (£400)? If not, how much would you expect this to be?

Question 38: Would you expect the LST-related CPC module to be captured within another day module for drivers? If so, how much of the course would you expect this to cover? (i.e. what proportion of the day, e.g. 0.5 days reflecting the half day course).

Ongoing costs (iii): Route requirements

174. As outlined initially under Option 1, operators will be required to carry out route risk assessments when operating LSTs, which is the additional cost beyond that expected when operating standard trailers only. These costs will be the same as under option 1 as while the expectation is that route assessments and compliance checks would be carried more periodically compared to option 1. We have assumed that there is not an additional cost than compared to existing route checks made for standard trailers or those under option 1, but we are seeking clarification on this through consultation.

Question 39: Do you already check your existing routes already? Would there be additional time associated with periodic checks on route planning for LSTs? If so, how much longer would you expect this to take?

Ongoing costs (iii) Tracking requirements

175. Under this option there is also a requirement to demonstrate to traffic commissioners that they can provide tracking data on request. We have included the indicative costs of installing tracker units on LSTs to be used for compliance reasons. Given that under this option DVSA or traffic commissioners can request information around the routes being used by operators, it is expected that this data would be collated and stored in some way by the operator so that it could quickly be provided should it be requested. Therefore, this has been estimated through desk-based research the average cost of a trailer tracker of £250 and data storage system (£720) which will be imposed on businesses choosing to operate an LST.

176. This could be inaccurately estimating the costs of tracking equipment as these are likely to be sold as part of wider software packages and subscription services. In some cases, the data could also be delivered from integrated IT systems for tractor unit which can provide this information without additional tracking units. However, as the knowledge of this is limited given the lack of publicly available costings for this work, but we are seeking clarification during consultation. Therefore, an estimated cost based on what we would expect to be the cost for the average operator and then calculated to a cost for each trailer. In the instance of data collection, this is modelled as a yearly cost per LST as it is often based on a subscription service to a third party.

Cost of tracking unit	£250
Cost of data collection system per LST	£720

Question 40: Are the costs of tracker units reflective of your expectations? If not, how much would you expect to cost per unit of each?

Question 41: Are the system costs to store and supply the trackers data in line with your expectations? If not, how much would you expect this to cost per trailer?

Non-monetised costs

177. The non-monetised costs outlined in Option 1 remain the same under this option.

Benefits

178. As covered in the summary section of this Option, we have assumed that the likely uptake of LSTs by operators would be slightly lower than that in Option 1. This is pertaining to the increased amount of regulatory burden associated with this option which may deter some operators from using LSTs, particularly the smaller hauliers with reduced amount of administrative capacity. Conversely, the number of miles saved through their operation is expected to be more in line with those observed by the trial given this option has higher additional regulation and expect that usage of LSTs would be more efficient than option 1 and more closely aligned efficiencies seen in the trial. This is offset in the scaling model given the implications of the additional regulation on barriers to uptake, which is stronger than the increases in economic savings and drives the lower overall savings seen compared to option 1.
179. Because of the scenario applied in the modelling of this option, all of the benefits outlined by Option 1 would still be the same, however the magnitude of these benefits would differ given the changes in the number of trailers taken up and their usage.
180. Following the interim recommendation on greenhouse gas values, a further sensitivity using the higher series of the non-traded CO2 equivalent costs has been provided to estimate the further impacts from greenhouse gas emissions savings. Based on this sensitivity, for this option there would be a 50% increase in the carbon dioxide reduction benefits, which increases the NPV in the best estimate case by 4.1% to £856.25m (2019 prices, 2021 PV).

Sensitivity Analysis

181. The sensitivity scenarios will follow the same process as outlined for Option 1. Which are summarised in the table below.

	Central (Best Estimate)	Low NPV	High NPV
Marginal External Costs (MECs)	Central DfT MECs	Low DfT MECs	High DfT MECs
Purchase price of LSTs	Observed market prices	Central plus 20%	Central minus 20%
Regulation and familiarisation costs	Central DfT estimate	Central plus 20%	Central minus 20%
Annual cost savings	Central DfT estimate	Central plus 20%	Central minus 20%

Wider Impacts

182. Following the analysis carried out under Option 1, this option might present slightly higher barriers for accessibility of small and micro businesses due to the higher requirements around submission of data and the specific routing requirements. Given the requirement to collect data on every route every LST undertakes and being required to submit data if requested to do so, it would be expected this could act as a barrier to deter uptake and could be more favourable towards larger businesses which have the financial resources to purchase the data required. This would be the case if operators don't already have this information and are required to purchase both the software required to format this data, and training of staff to meet the regulatory requirements under this option.

183. A further potential barrier as identified through surveying the potential costs of tracking services is that small and micro businesses may be unable to get access to the same level of services as larger hauliers. This is due to many of the services provided by private companies require a minimum number of trailers (around 20 in some cases) before they can access their services. Given many of the small and micro businesses may not have this number, this may act as a barrier in meeting these requirements or come at an increased cost to business due to the need for standalone tracking units and self-managed data systems. This will be considered during consultation and we will ensure that these barriers and costs are carefully mitigated before making the regulatory change.

Option 3 – General circulation option

184. The costs and benefits and sensitivity scenarios for this option are the same as those outlined in “Option 1 – Lighter additional regulation” section of this document. The costs associated with regulation are not captured within this option as they are assumed to be the same as current standard trailer requirements. The summary table for the costs and benefits is provided below. This option has been modelled based on the regulatory option 3 explained within the Options section of this document.

185. In the forecasting scaling model, it is assumed that the savings resulting from this option would be much lower than in the other options given there are no specific requirements on the operation of LSTs, and they are treated as a standard 13.6m trailer. Given this, it is assumed that some operators would choose to buy and use LSTs as normal trailers to give them the flexibility to attract new business which may permit them to use these. Coupled with the lack of data collection and submission to encourage efficiency, the savings would be significantly lower than under trial conditions, but uptake would be higher than that modelled given some operators would buy these and operate them as a 13.6m trailer. The sensitivity scenarios will follow the same process as outlined for options 1 and 2, except there are no regulatory costs and therefore no sensitivities on these.

Impact	Type of impact	Direct/Indirect
<u>Costs</u>		
Initial assessment	Business, Transition cost	Direct
Viability assessment	Business, Transition cost	Indirect
Trailer replacement costs	Business, Ongoing cost	Indirect
Taxation revenue	Non-Business, Annual cost	Indirect
<u>Benefit</u>		
Fuel saving	Business, Annual benefit	Indirect
Labour saving	Business, Annual benefit	Indirect
Tyre saving	Business, Annual benefit	Indirect
Repairs and maintenance savings	Business, Annual benefit	Indirect
VED and RUL savings	Business, Annual benefit	Indirect
Congestion	Non-Business, Annual benefit	Indirect
Air Quality	Non-Business, Annual benefit	Indirect
Greenhouse Gases	Non-Business, Annual benefit	Indirect
Infrastructure	Non-Business, Annual benefit	Indirect
Noise	Non-Business, Annual benefit	Indirect

Summary

£million, 2019 prices, PV 20 years	Option 3		
	Low	High	Best Estimate
<u>Costs</u>			
Trailer Replacement	161	107	134
Taxation Revenue	1	1	1
Regulation costs	0	0	0
Initial assessment	10	7	9
Viability assessment	28	19	23
Total Costs	201	134	167

<u>Benefits</u>			
Fuel Saving	106	132	110
Labour Saving	203	254	212
Congestion	357	461	441
Air Quality & Greenhouse Gases	116	116	116
Infrastructure	101	101	101
Noise	45	45	45
Tyre saving	9	11	9
Repairs & Maintenance saving	28	36	30
VED and RUL saving	7	8	7
Total Benefits	971	1,164	1,070
NPV	771	1,030	902

Costs

186. The costs under this option will be the same as those under option 1 and 2 for familiarisation, as these costs would be incurred by operators when reviewing the legislation and deciding whether LSTs might be viable for their business or not. However, given that there is no specific regulation for LSTs under this option as they will be treated the same as standard trailers there will be no regulatory costs as a result.

187. We would expect there to be some differential in the non-monetised accident costs under this option as there would be some degree of trial and error with the use of LSTs on specific routes, which may increase the risk of incidents. Given the lack of evidence to support this, this will be non-monetised until better evidence comes to light, and the potential safety implications will be considered under this assumption.

Benefits

188. As covered in the summary section of this option, the likely uptake of LSTs by operators would be higher than that in Option 1 and 2 and would be slightly higher than those forecast by Risk Solutions modelling. This is due to the LSTs being treated as standard-length trailers, so all of those that can identify a possible need either now or in the future may choose to purchase an LST even if there is no immediate requirement for them. Conversely, the number of miles saved through their operation to be significantly lower than in the trial and other options within this analysis, given the inefficiencies that may arise through the lack of regulation and oversight by the Department on the usage of the trailers.

189. Because of the scenario applied in the modelling of this option, all of the benefits outlined by option 1 would still be the same, however the magnitude of these benefits would differ given the changes in the number of miles saved and the efficiency assumed in doing so.

190. Following the interim recommendation outlined above, a further sensitivity using the higher series of the non-traded CO2 equivalent costs has been provided to estimate the further impacts from greenhouse gas emissions savings. Based on this sensitivity, for this option we would expect to see a 50% increase in the carbon dioxide reduction benefits, which increases the NPV in the best estimate case by 3.3% to £930.98m (2019 prices, 2021 PV).

Sensitivity Analysis

191. The sensitivity scenarios will follow the same process as outlined for Option 1 and 2. Which are summarised in the table below.

	Central (Best Estimate)	Low NPV	High NPV
Marginal External Costs (MECs)	Central DfT MECs	Low DfT MECs	High DfT MECs
Purchase price of LSTs	Observed market prices	Central plus 20%	Central minus 20%
Regulation and familiarisation costs	Central DfT estimate	Central plus 20%	Central minus 20%
Annual cost savings	Central DfT estimate	Central plus 20%	Central minus 20%

Wider Impacts

192. In comparison to the analysis carried out for options 1 and 2, this option would provide the most flexibility for small and micro businesses to be able to use and operate LSTs, with minimal barriers and costs in doing so. As this option treats LSTs as standard articulated HGVs, there would be no additional burden than currently experienced, for standard trailers and this would allow them to access and use LSTs in the same way that larger businesses would. As mentioned under option 1, larger businesses may be more able to access the benefits of LSTs, however this option decreases the barriers to smaller businesses in owning them, though LSTs may still be unsuitable for many of these businesses and it would take them longer to adapt to the new market.

Risks and uncertainty

The scaling model

193. Throughout this analysis, the scaling model has been used to model the options and the forecasted uptake and distance savings which result, which are in turn used to estimate the costs and benefits under each of the options. As highlighted in the scaling model section, multipliers have been used in the modelling to estimate the behavioural responses under the different options presented against that of the trial (of which the model extrapolates from). These multipliers are based on the uptake and the savings, the logic being the higher the regulation the lower the uptake, but the higher the distance savings and vice versa.

194. In determining the multipliers to be used here, judgement based on the additional regulation that were being put in place when comparing against the baseline option which have enabled the modelling of the options. There is a moderate amount of uncertainty surrounding this due to the prediction of behavioural responses, when it is uncertain how the industry would react to LSTs being legalised for uncapped use on the road. This is also compounded by the perceptions of the regulation in place, these might appear burdensome at the outset, but in practice many of the operators might already be meeting the general forms of the regulation such as the route risk assessment, compliance and tracking of trailers. This may underestimate the uptake and therefore the NPVs would be higher. Conversely, for smaller operators (with the largest market share), the regulation posed may be too burdensome and reduce the uptake below that envisaged.

195. Furthermore, on the savings multiplier, we have judged this based on how we would expect hauliers to react to the different levels of regulation put in place. It has been assumed that the higher the regulation the closer to the trial savings given the compliance checks put in place. Under option 3 we have assumed in the absence of regulation that operators could act inefficiently and therefore lower the savings considerably. In the absence of evidence of the behaviours, the worst-case elements of this has been estimated to determine the multipliers, but this may be underestimating the benefits which could lead to higher NPVs across the options. We are looking to strengthen the assumptions underpinning the scaling model throughout consultation and adjusted for the final impact assessment. This will also be reviewed under the objectives in the post-implementation review.

196. There is a significant uncertainty in the estimated take up percentage in scenario A and especially scenario. This is because it was based on the 2017 survey, so only from 126 operators who responded to the survey and only at one point in time across the trial. Also, the estimated savings factor for each cluster assumes that the trial population is a representative sample of the whole industry, where this might not be the case as goods densities and therefore distance savings could vary as the population of businesses operating LSTs changes in a post-trial environment.

197. One final aspect to note is that a key driver of the uncertainty within the modelling is that operators may simply choose not to implement LSTs, when we have modelled that they would. This would mean that we might not achieve the modelled results set out by this assessment and is therefore expected to be lower. Given the nature of the modelling, any deviation from the uptake is likely to impact across all options and given the conclusions we would expect that the comparison between options of the net benefits would remain the same, just differential in the magnitude following the lower uptake.

Benefits based on MECs methodology

198. As noted in the benefits section of this analysis, the benefits have been estimated using the standard department produced MEC values, which are based on full laden articulated HGVs. As the journeys being replaced by LSTs are constrained by volume and not weight, it is true that the weight would be less than a full laden articulated HGV, and therefore have lower impacts to aspects such as infrastructure, noise and congestion. These journeys are then replaced by LSTs, operating at or near the 44-tonne weight limit. Therefore, we would be slightly overestimating the net benefits from switching to LSTs and we have assumed the weight of vehicles being replaced is higher than observed.

199. Furthermore, the congestion impacts are expected to face similar uncertainty as these benefits are based on a typical car and scaled up using Passenger Car Uplift (PCU) factors, where the factor for HGVs is 2.9. One of the key determinants of the PCU factor is the vehicles length, and as LSTs are longer by up to 2.05m, we would expect a larger PCU (and resulting in larger congestion costs from LSTs). This has similar implications as the scale of the net benefits would be smaller as the congestion impacts from LSTs may be larger. Added to this, it is understood that LSTs operate largely on the SRN where the impact from additional lengths are lower which may offset part of this increase.

200. Given the complexities in this modelling these aspects, these will be considered throughout the consultation phase and improved estimates sought for the final stage modelling to correctly assess the benefits of this regulatory change and therefore the societal benefits in doing so.

Emissions modelling

201. Linked to the scaling model, there is also the emissions modelling which is based on the distance savings which was discussed above. The emissions are currently based on Euro V emissions vehicles

which were introduced in 2008, with subsequent Euro VI emissions introduced in 2014 for HGVs¹⁸. This approach was used on proportionality grounds and the lack of detailed information of the vehicles currently being used in the sector. This introduces some risks as the analysis would be somewhat overestimating the NOx and PM emissions saved throughout the options as if there is a larger proportion of Euro VI vehicles, there would be lower emissions being saved. This is difficult to determine the overall impact as the emissions saved would be lower (as they are more efficient vehicles) but are being replaced with more efficient emission vehicles with the introduction of LSTs. Improvements to the emissions factors accounting for the gradual move towards Euro VI vehicles will be carried out during the consultation period for inclusion in the final impact assessment. This would also be reviewed as part of the main objectives of the post-implementation review.

Trailer replacement cycles

202. As outlined in the costs sections, we have based the costs of trailer replacements on a 10-year replacement cycle, which was the initial expectations at the beginning of the trial, hence the trial length for 10 years. However, we understand that for many operators would have shorter replacement cycles or currently lease their trailers for a lower duration which would reduce this assumption. While we have some information of this through the 2017 Risk Solutions survey, we are seeking further clarity during consultation. With a lower replacement cycle it would mean that the costs of trailer replacement are being underestimated under the options here as the marginal cost of the trailer would be imposed on operators choosing to have LSTs more frequently over the appraisal period which would reduce the NPVs across the options. We have sought clarification on this during consultation to implement in the final stage to improve this accuracy.

Second hand market

203. Like the trailer replacement costs, throughout the analysis we have assumed that there would be no second-hand market for LSTs and any trailers purchased would be at the full marginal value beyond a standard trailer. However, it is widely expected that under the options presented here that a second-hand market would become more prominent (as it is currently establishing under the trial) as there is no need for Vehicle Special Orders to operate trailers. Under the expectations as seen for standard trailers, operators would be able to purchase used trailers at a lower cost. To accurately estimate the business costs, this should be captured within the analysis, however it is unknown the number of operators who would buy LSTs and those of which who would prefer to purchase them second hand. It is also unknown what the future market value of older trailers would be to determine the marginal price above used standard trailers. This increases the level of uncertainty as the costs may be slightly overestimated and therefore the NPVs across the options may be slightly higher than modelled. We have sought clarification during the consultation with a view to improve this for the final stage, however this is not planned to be re-assessed through the post-implementation review as the impacts are expected to be minimal.

¹⁸ https://theicct.org/sites/default/files/publications/ICCT_Euro6-VI_briefing_jun2016.pdf

Annex A: Accidents and Road Safety commentary

Articulated HGV road safety stats

Articulated HGVs make up around 2.9% of all motor vehicle traffic in Great Britain, with around 98% of vehicle miles travelled on major roads (motorways and A roads)¹⁹. The HGV casualty rates (casualties per vehicle mile) for all severities is lower than the average casualty rate for all motor vehicles. However, the fatality rate per mile of HGV operation is around 3 times higher. This is shown in the table below:

Table 1: Casualties per billion vehicle miles (Great Britain, 2017)²⁰

	All severities	Fatalities
All motor vehicles (2017, per billion vehicle miles)	522.8	5.5
Articulated HGVs (2017, per billion vehicle miles)	261.8	13.4
Articulated HGVs (2015-2017, per billion vehicle miles)	312.5	14.0

Introduction of LSTs

Introducing longer semi-trailers onto roads in Great Britain will have two impacts on road safety:

1. Reducing the number of articulated HGVs on the road

The introduction of LSTs is aimed to reduce the number of articulated HGVs on the road. A smaller total number of trucks on the road and fewer vehicle miles travelled can result in a lower likelihood of a road traffic accident involving an articulated HGV and therefore a reduction in the number of casualties per year. During the trial, this saving has been estimated and reported annually as being in direct proportion to the km saved. Although LSTs are expected to reduce the number of vehicles and therefore miles travelled, this may free up drivers to use other vehicles or lower the shortage of drivers in the industry. The safety considerations here only look at the direct effects of LSTs replacing standard trailers with everything else held constant.

2. Increasing the number of LSTs on the road

LSTs will replace the use of a portion of the articulated HGVs on the road and therefore the distance travelled by LSTs will increase over time. This might increase the likelihood of a road traffic accident involving an LST and therefore increase the number of casualties involving LSTs per year (but perhaps by less than the saving made in (1), above).

The increase in the number of casualties is also dependent on the casualty rate for LSTs. LST casualty rates might be expected to be greater than those for the HGVs they replace, in an unregulated scenario (such as option 3). This presumption is because LSTs have greater tail-swing or kick-out than regular articulated HGVs which may result in additional safety risks.

It is unknown exactly how much LSTs are likely to increase the casualty rate risk, however the increase is not expected to be large. The desktop research from TRL prior to the trial, was based on a range of theoretical LST designs, estimated that by introducing LSTs in the UK, there would be a very small increase in the casualty risk per vehicle mile, but this would be so small that it would be immeasurable in the casualty data²¹. However, this desktop work included a range of assumptions that would need to

¹⁹ [TRA3105 tables published by DfT statistics](#)

²⁰ Calculations based on [RAS40005 tables published by DfT statistics](#)

²¹ TRL (2010) - The likely effects of permitting longer semi-trailers in the UK: vehicle specification performance and safety

be checked against actual trial and anticipated future conditions (around actual LST designs and usage) before being applied directly to future projections.

Various controls can be used to mitigate against the risk of an increased casualty rate. These are:

- i. Vehicle design – steering axle design to reduce the tail-swing or kick-out of the trailers. Other designs such as active steer or other technologies could also provide mitigations;
- ii. Operating standards – operator licensing requirements, qualifications, driver training;
- iii. Controlled trial conditions – replicating route assessment conditions from the LST trial

Therefore, although LSTs are longer, mitigating actions can be put in place that will prevent the LST casualty rate increasing to a significantly higher rate than standard articulated HGVs and with appropriate operational management could lower the accident risk (as has been demonstrated on the trial).

Indicative modelling work

The introduction of LSTs is estimated to ‘save’ around 8 million vehicle miles in 2018 based on the reduced trips necessary to transport the same amount of goods. During 2018, LSTs recorded a distance travelled of around 90 million miles and based on data obtained during this trial standard HGVs would have covered 98 million miles. A reduction in vehicle miles will lower the probability that a road traffic accident involving an articulated HGV will occur and it is expected that lower vehicle miles will decrease the number of casualties involving an articulated HGV.

Scenario	Articulated HGVs		LSTs		Net change in casualties
	Reduction of 98m miles		Increase of 90m miles		
	Casualty rate (per bn vehicle miles)	Change in casualties	Casualty rate (per billion vehicle miles)	Change in casualties	Net reduction of 8m miles
Articulated HGV casualty rate applied to LSTs ²²	261.8	- 25.6	261.8	23.4	- 2.2
The trial LST rate	261.8	- 25.6	115.9	10.4	- 15.2
LST rate increased by 1%	261.8	- 25.6	264.4	23.7	- 1.9

At the current articulated HGV casualty rate, a reduction of around 8 million articulated HGV miles may prevent around 2.2 casualties per year.

When compared to a standard articulated trailer and without special management, LSTs might be expected to have a greater risk of accidents due to the longer length and turning characteristics without special management. However, the mitigating actions in place are expected to reduce the risk of an increased casualty rate for LSTs. Modelling work has been completed to identify the maximum increase in casualty rates for LSTs that will maintain the current number of casualties per year caused by articulated HGVs.

A reduction of 98 million articulated HGV miles at current casualty rates may prevent around 25.6 casualties per year. Therefore, with 90 million kilometres travelled by LSTs, the LST casualty rate would need to be 9% higher than the articulated HGV casualty rate to maintain a net change in the number of casualties as 0.

²² A 2016-2018 average LST rate has been compared to a single year (2017) articulated HGV rate. A comparable three-year articulated HGV fleet would be higher and serve to increase the reduction in casualties so we have used cautious assumptions throughout this Annex.

Risk Solutions' analysis of the trial data gives a 3-year average casualty rate for LSTs of around 115.9 casualties per billion vehicle miles. This is a 56% reduction when compared to current articulated HGV casualty rates and was estimated with data from the LST trial, where LSTs are operated in controlled conditions with various safety precautions in place. This casualty rate therefore applies to trial-only conditions and may not be replicated if LSTs are operated outside of these. Applying the trial-produced casualty rate may prevent around 15.2 casualties per year. The estimated reduction observed in the analysis may not be the observed reduction outside of trial conditions given the measures in place. However, this will depend on the future regulatory regime with regards to LSTs and the number of vehicles using the trailers which have been designed to reduce accident rates. We will seek to gather further information at consultation phase to attempt to model this for the final stage IA.

A very small increase in LST casualty rates (as implied by the TRL desktop research) may see an increase of around 1%. In order to carry out this analysis, we estimated a 1% increase on the number of casualties as a result of the LST introduction to estimate the impact of TRL's increased casualty rate. Even with an increased casualty rate, due to the overall net reduction in miles, this may still prevent around 1.9 casualties per year.

Impacts on pedestrians and cyclists

It is thought that given the longer length of LSTs, there may be additional risks which are presented directly to pedestrians and cyclists where LSTs operate which may be more pronounced in urban areas. Over the course of the trial, operators have submitted accident reports to the Department whenever an incident occurs which resulted in an injury or damage only incident. As part of the annual reporting process, Risk Solutions have provided summaries of these reports which indicate the severity, a description of the incident and those involved and determination if it was caused by the LST specifically.

Up to the end of 2018, there have been 33 reported incidents involving an LST on public roads which have been reported to the Department, two of which have involved either a cyclist or a pedestrian. There was an additional incident in 2019 which has not been reported yet but has been included. These are described in further detail below:

- An incident in 2015 where an LST hit a pedestrian with a tail end of the trailer while making a turning manoeuvre in an urban location during a driver assessment. This resulted in a 'slight' injury and judged to be caused by the longer length vehicle. The route is no longer used for driver assessment.
- An incident in 2016 where an LST hit a cyclist from behind when moving from slip road to dual carriageway. This resulted in a 'serious' injury which was judged to be not LST-related and would have occurred if the trailer had been a standard one.
- An incident in 2019 which resulted in the death of a cyclist, where the cyclist fell off while an LST was overtaking. From engagement with the policy, it is judged that the LST was not to be the cause of this incident.

Further to this, we commissioned our partner Risk Solutions to consider the casualty rates for LSTs when compared to the standard articulated HGV to determine the overall impact. Based on this analysis, the following casualty rates were calculated:

Cyclists and pedestrians²³ casualty rates	Casualty rates per billion vehicle kilometres
Articulated HGV (2012-2018)	11.27
LST (2012-2019)	4.02

²³ This assessment does not consider the vulnerable road users such as those on mobility scooters or horse riders.

From this, it can be inferred that the cyclist and pedestrian casualty rate for LSTs appears to be lower than the corresponding articulated HGV fleet average casualty rate, though this is based on a very small sample size. For that reason, while we can conclude that the casualty rate for LSTs appears lower than that for articulated HGVs, the difference in the rates is not statistically significant (at the 95% confidence level) due to the small number of incidents recorded. This will be examined in further detail during any post-implementation review.

Value of casualty prevention

Using the average value of prevention per casualty from the TAG Data Book²⁴, the net change in casualties can be monetised to produce an indicator of the likely impacts to society per year. These impacts are currently non-monetised and have not been included in the analysis included in the impact assessment due to the uncertainty around these. The values provided in Table 2 below are for indication only, and an improved monetisation approach to capture the potential safety benefits will be included in the NPV analysis at the final stage.

Table 2: Average value of prevention of casualties based upon the 2018 LST fleet, 2019 prices

Scenario	Net change in casualties	Net change in casualty costs
HGV casualty rate applied to LSTs	-2.2	-£329,255
The trial LST rate	-15.2	-£2,314,657
LST rate increasing by 1%	-1.9	-£293,635

Breakeven NPV analysis

Table 3: Breakeven NPV analysis, 2019 prices

Option	Scenario	NPV (£m)	Breakeven fatalities (over 20 years)	Breakeven, all severities (over 20 years)
Option 1	Best Estimate	£1,122	553	15,295
	Low	£979	482	13,346
	High	£1,193	588	16,263
Option 2	Best Estimate	£834	411	11,369
	Low	£680	335	9,270
	High	£924	455	12,596
Option 3	Best Estimate	£939	463	12,801
	Low	£847	417	11,546
	High	£975	480	13,291

In the table above, the calculated NPVs from the IA have been used to determine the breakeven number of casualties required for the NPV to reduce to zero for this intervention. This has been calculated by dividing the NPVs for each option and scenario and dividing by the fatality value of prevention and the all severity value from the TAG Data Book.

To enable comparison, we have compared this against the GB Articulated HGV fleet fatalities calculated by Risk Solutions in their 2018 Annual Report. Over the trial period of 2012-2017, there were 726 fatalities and 18,114 casualties. Comparing to the preferred option best estimate, this would indicate that an additional

²⁴ Table A4.1.1 – Social Impacts TAG

76% and 84% of the accidents involving articulated HGVs over the 6-year period would have to occur over the appraisal period to warrant a breakeven NPV.

Comparing to the number of trailers in the traffic commissioners annual report, there are around 195,000 trailers on standard national licenses²⁵ (includes all trailer categories) and LSTs would represent around 10% of all trailers in GB based on the projected number of trailers at the end of the appraisal period. Given the uptake of trailers is likely to increase over the 20-year period, the LST share would be lower which decreases the likelihood of the extra fatalities being realised to switch the NPV to zero. Therefore, as LSTs would have to generate an additional 76% of fatalities over the 20-year period, and using the evidence provided from the trial, the probability of the NPV being close to zero is minimal.

Conclusion

Based on the analysis carried out in this annex, even under a scenario where the accident risk rate is higher for LSTs, as indicated by the TRL desktop research, LSTs may provide a net benefit to society through accident reduction. This is due to the reduction in miles travelled by standard trailers outweighing the potential increased risk of operating LSTs. Using the observed data on accidents from the trial, the benefits could be significantly higher, however given LSTs are currently operating under trial conditions, this is not directly applicable to non-trial conditions which will need to be considered by the policy options. Subject to the design of the policy and its likeness to the trial (or not) we will be able to make a more accurate assessment of the potential safety benefits in using LSTs through a reduction in miles travelled.

²⁵ Table 2, Traffic Commissioners Annual Report. This is the only available estimate at this stage and captures both rigid and articulated HGVs when the latter would be a more accurate comparison to make. A more robust estimate will be sought for the final stage impact assessment.

Annex B: Summary of Impact Assessment consultation questions

Question number	Question
1	Does the assumption on the time-taken for infrastructure changes (10 years) follow your expectation? If not, what would you expect this to be and what would drive this?
2	What is the current operating life expectancy of a LST trailer (we currently assume 10 years)? If this is different, what drives this? Is this different to a standard trailer?
3	What are the expected scrappage value of an LST trailer (this should capture the price paid for the trailer minus the costs of disposal)? If the value depends on the specific LST design, please note the factors driving this variance.
4	Is the time taken in the Tier 1 and Tier 2 review reflective of the expected time taken to carry out these tasks? If not, what would be a reasonable estimate for the number of Tier 1 and Tier 2 days? (note, this is 0.5 for Tier 1, and 5 for Tier 2.)
5	Is the number of operators in scope for each Tier 1 and Tier 2 review reflective of the actual number of operators in scope? If not, how many operators would be expected to review in each Tier? (note, this is 62,415 in Tier 1, and 16,618 in Tier 2.)
6	What employees do you expect to be involved with the review of the regulation? How many hours would you expect each individual in your organisation to take to review the options under Tier 1 and Tier 2? (e.g. how many hours for each employee (e.g. director, transport manager, admin staff))
7	Do you foresee any further familiarisation costs necessary to accommodate future increased amounts of LSTs? If so, how long would you expect these to last for and at what cost?
8	What proportion of LSTs would you expect to be using in your fleet that are older than 10 years of age? How long would you expect to continue using these beyond 10 years?
9	How long would you be considering owning a new trailer for? Would you expect to sell this on the second-hand market or scrap the trailer at the end of this period?
10	If you were to consider purchasing a second-hand trailer, how many years would you expect to continue using it for?
11	If you own LSTs of each length (up to 14.6m and 15.65m), how many more of each length would you consider buying?
12	Do you expect that there would be additional time associated with carrying out the route risk assessments or responding to driver's feedback on routes than already considered for standard trailers? If so, how much longer would you expect this to take?
13	Would you expect to train drivers on a group-basis in one go, or one a one-to-one basis? If on a group-basis, how many would you train at one time?
14	If you choose to operate LSTs will you have to provide further training to existing employees for them to be able to operate the LSTs? If so, at what cost per employee?
15	Do you anticipate that you would have to provide future training to employees under this option? If so, what would you expect the cost of this to be per employee?

16	How many drivers would you expect to train in comparison to the number of trailers in your fleet? I.e. what ratio of drivers to trailers would you use.
17	Is the assumption on the loss of business time doubling the training cost follow your expectations? If not, how much more than the training would you expect this to be?
18	Is the assumption on each driver obtaining one on one training suitable? If not, how many drivers would you expect to train in one go in your business?
19	Would you seek to vary your license again if you saw distinct business benefits from your initial experience of using LSTs? If so, when would you expect to re-apply for a variation? (i.e. the number of years)
20	Which employees would be expected to be involved in this work? How many hours would it take for each of these to draft and review the license application before submitting? (i.e. we are looking for the number of hours for each employee).
21	Are the observed average fuel consumption rates from LSTs the same as standard articulated vehicle trailers for a similar cargo weight? If not, how much do LSTs affect these rates?
22	Are the employee costs presented by the Transport Engineer report reflective of your average employee costs (salaries of £37,184)? If not, how much different is this?
23	Are the annual mileage per driver of 85,000 presented in the Transport Engineer report reflective of your average driver mileage? If not, how much different is this?
24	Are current LST operatives paid a premium for operating LST trailers? Do you plan on changing this if LST operation continues/grows?
25	Are the costs provided by the Transport Engineer report representative of the standard trailer annual running costs? These are presented in the table below.
26	Are the annual running costs the same for LSTs as the current standard trailers (see Question 8)? If not, by what percentage are these different?
27	Have you experienced lower tyre costs associated with operating LSTs due to the reduced tyre scrub from the steering axle systems? If so, how much cheaper would you expect this to be per trailer each year? (i.e. what percent were they different)
28	Have you experienced increased/decreased repair and maintenance costs while using LSTs with self-steer systems? If so, how much was this increase?
29	Are there any other factors that we have not mentioned that would change the observed accident rates if we were to allow LSTs to operate outside of trial conditions?
30	How many LSTs do operators with less than 10 employees intend to use in the future?
31	How many LSTs do operators with less than 50 employees intend to use in the future?
32	Are either of these operators (with less than 50 employees) subject to higher costs than those which have been assessed in this consultation document?
33	If you are a small/micro business, how likely are you to buy a second-hand trailer over a brand new trailer? Please provide a percentage where possible.
34	If you are likely to purchase a second-hand trailer, what age of trailer would you expect to purchase?
35	How much is purchasing a second-hand trailer likely to reduce purchasing costs by? Please provide an expected percentage saving in costs.

36	Does the figure of £650, which captures the additional monitoring costs to the OTC and DVSA reflect expectations? If not, what would you expect this cost to be per trailer?
37	Does the cost of a day's training on a CPC-accredited LST module meet your expectation of the cost (£400)? If not, how much would you expect this to be?
38	Would you expect the LST-related CPC module to be captured within another day module for drivers? If so, how much of the course would you expect this to cover? (i.e. what proportion of the day, e.g. 0.5 days reflecting the half day course).
39	Do you already check your existing routes already? Would there be additional time associated with periodic checks on route planning for LSTs? If so, how much longer would you expect this to take?
40	Are the costs of tracker units reflective of your expectations? If not, how much would you expect to cost per unit of each?
41	Are the system costs to store and supply the trackers data in line with your expectations? If not, how much would you expect this to cost per trailer?

Annex C: Draft Post-Implementation Review (PIR) plan

1. **Review status:** Please classify with an 'x' and provide any explanations below.

<input type="checkbox"/>	Sunset clause	<input checked="" type="checkbox"/>	Other review clause	<input type="checkbox"/>	Political commitment	<input type="checkbox"/>	Other reason	<input type="checkbox"/>	No plan to review
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2. **Expected review date** (month and year, xx/xx):

0	1	/	3	0
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This review date has been identified given the significant lead time before LSTs will begin to enter into general circulation in significant numbers. Businesses will need to understand whether LSTs will benefit their operation, order and receive LSTs. As only major operators purchase new LSTs, it will then be some time before significant numbers are available and been in operation to smaller operators second hand.

3. **Net costs/benefits set out in original legislation:**

<p>Net cost to business per year (£m)</p> <p>£0.57</p>	<p>Net Present Value (£million):</p> <p>£1,037.00</p>	<p>Total Cost (Present Value) (£million):</p> <p>£338.33</p>
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4. **Rationale for PIR approach:**

Level of evidence and resourcing that will be adopted for this PIR: High

The financial benefits of allowing Longer Semi Trailers (LSTs) to enter into general circulation is expected to be somewhere between £930 million and £1.1 billion over 20 years. Prior to amending the appropriate legislation to allow LSTs to enter into general circulation an extensive trial was conducted which proved operators could, in the right circumstances, achieve significant efficiency savings which resulted in significant emission savings being achieved and demonstrated the potential benefit the introduction of LSTs may have if introduced in significant numbers on easing congestion. The trial also demonstrated that LSTs could be operated at least as safely as standard 13.6m trailers, if appropriate mitigation measures were put in place to address the increased road safety risk posed by the unique handling characteristics of LSTs. However, once the amending legislation comes into effect other than information relating to incidents which LSTs are involved, no other data which was collected under the trial will continue to be collected due to the impact it is believed such a regulatory burden would have on take up of LSTs. As such in order to identify the level of benefits being achieved by LSTs once they have entered into general circulation it is proposed that a study be undertaken a year before the PIR is undertaken to capture this and enable comparisons to benefits being achieved under the trial and to the operation of 13.6m trailers to be made.

Key Objectives, Research Questions and Evidence collection plans- template Describe the main objectives of the regulation(s) under review as well as the key questions that will need to be researched to measure whether objectives have been successful. Next, consider any existing data/evidence sources that may help you answer this question as well as any new evidence that you may wish to collect, where proportionate.			
Key objectives of the regulation(s) (add rows as appropriate)	Key research questions to measure success of objective	Existing evidence/data Please consider: a) The data/evidence <i>sources</i> b) The <i>timeframes</i> they reference	Any plans to collect primary data to answer questions? Please consider: a) <i>How</i> stakeholder views will be collected b) <i>Timeframes</i> for evidence collection c) Why collecting new data is (or is not) <i>necessary/proportionate</i>
To enable the market to determine the number of LSTs in operation	How many LSTs are in operation? How many new LSTs are being operated by? How many second hand LSTs are being operated? Is there any reasonable expectation that the number of LSTs in operation will continue to grow?	Pre LST trial desktop analysis Annual Reports for each year the LST trial ran (2012 – 20XX) Various supporting detailed notes on specific issues produced by the company running the trial on the Department’s behalf produced throughout the trial.	It is proposed a snap shot study will be undertaken a year prior to the PIR report being due in order to gain sufficient evidence to be able to answer the questions posed. Such a study is the only proportionate way to obtain the evidence required in order to undertake the PIR. It is likely that stakeholders who operate LSTs will be identified from records the Office of the Traffic Commissioner hold on which operators hold licenses to operate LSTs and that they will be contacted directly to ask whether they will be content to take part in the study.
To enable the road freight sector to become significantly more efficient	How many journeys does it take the most efficient operators of LSTs to transport the same volume of goods as operators of 13.6m trailers? How many journeys does it take the least efficient operators of LSTs to transport the same volume of goods as operators of 12.6m trailers?	Pre LST trial desktop analysis Annual Reports for each year the LST trial ran (2012 – 20XX) Various supporting detailed notes on specific issues produced by the company running the trial on the Department’s behalf produced throughout the trial.	It is proposed a snap shot study will be undertaken a year prior to the PIR report being due in order to gain sufficient evidence to be able to answer the questions posed. Such a study is the only proportionate way to obtain the evidence required in order to undertake the PIR. It is likely that stakeholders who operate LSTs will be identified from records the Office of the Traffic Commissioner

	<p>How many journeys does it take operators who fall into the middle group (in terms of efficiency savings being achieved) when compared to operators of 13.6m trailers?</p> <p>How many journeys does it take the average operator of LSTs to transport the same volume of goods as operators of 13.6m trailers?</p>		<p>hold on which operators hold licenses to operate LSTs and that they will be contacted directly to ask whether they will be content to take part in the study.</p>
<p>In becoming significantly more efficient this enables businesses in this sector to be put on a more stable operational footing and achieve higher margins</p>	<p>What level of financial saving/benefit is being achieved by operators who are achieving the greatest efficiency saving and how does this compare to operators of 13.6m trailers?</p> <p>What level of financial saving/benefit is being achieved by operators who are achieving the least efficiency saving and how does this compare to operators of 13.6m trailers?</p> <p>What level of financial saving/benefit is being achieved by operators who fall into the middle group (in terms of efficiency savings being achieved) and how does this compare to operators of 13.6m trailers?</p> <p>What is the average level of financial saving/benefit being achieved by operators and how does this compare to operators of 13.6m trailers?</p>	<p>Pre LST trial desktop analysis Annual Reports for each year the LST trial ran (2012 – 20XX) Various supporting detailed notes on specific issues produced by the company running the trial on the Department's behalf produced throughout the trial.</p>	<p>It is proposed a snap shot study will be undertaken a year prior to the PIR report being due in order to gain sufficient evidence to be able to answer the questions posed. Such a study is the only proportionate way to obtain the evidence required in order to undertake the PIR. It is likely that stakeholders who operate LSTs will be identified from records the Office of the Traffic Commissioner hold on which operators hold licenses to operate LSTs and that they will be contacted directly to ask whether they will be content to take part in the study.</p>

<p>In becoming significantly more efficient in their operation this will enable the sector to make significant emissions savings</p>	<p>What level of environmental savings are being achieved by the most efficient operators? What level of environmental savings are being achieved by the least efficient operators? What level of environmental savings are being achieved by the middle group (in terms of efficiency savings being achieved)? What is the average level of environmental savings being achieved? What is the estimated total of environmental savings achieved since LSTs entered into general circulation?</p>	<p>Pre LST trial desktop analysis Annual Reports for each year the LST trial ran (2012 – 20XX) Various supporting detailed notes on specific issues produced by the company running the trial on the Department’s behalf produced throughout the trial.</p>	<p>It is proposed a snap shot study will be undertaken a year prior to the PIR report being due in order to gain sufficient evidence to be able to answer the questions posed. Such a study is the only proportionate way to obtain the evidence required in order to undertake the PIR. It is likely that stakeholders who operate LSTs will be identified from records the Office of the Traffic Commissioner hold on which operators hold licenses to operate LSTs and that they will be contacted directly to ask whether they will be content to take part in the study.</p>
<p>The operation of LSTs has been able to contribute to a reduction in congestion</p>	<p>What estimated number of 13.6m trailer journeys has been saved? Has this saving contributed to a reduction in congestion?</p>	<p>Pre LST trial desktop analysis Annual Reports for each year the LST trial ran (2012 – 20XX) Various supporting detailed notes on specific issues produced by the company running the trial on the Department’s behalf produced throughout the trial.</p>	<p>It is proposed a snap shot study will be undertaken a year prior to the PIR report being due in order to gain sufficient evidence to be able to answer the questions posed. Such a study is the only proportionate way to obtain the evidence required in order to undertake the PIR. It is likely that stakeholders who operate LSTs will be identified from records the Office of the Traffic Commissioner hold on which operators hold licenses to operate LSTs and that they will be contacted directly to ask whether they will be content to take part in the study.</p>
<p>LSTs are able to achieve these benefits whilst operating as safely as 13.6m trailers</p>	<p>What is the casualty rate for LSTs per million kilometres?</p>	<p>Pre LST trial desktop analysis Annual Reports for each year the LST trial ran (2012 – 20XX)</p>	<p>It is proposed a snap shot study will be undertaken a year prior to the PIR report being due in order to gain sufficient evidence to be able to</p>

	<p>How does the casualty rate for LSTs per million kilometres compare to 13.6m trailers? Can LSTs be considered to be at least as safe as 13.6m trailers?</p>	<p>Various supporting detailed notes on specific issues produced by the company running the trial on the Department's behalf produced throughout the trial.</p>	<p>answer the questions posed. Such a study is the only proportionate way to obtain the evidence required in order to undertake the PIR. It is likely that stakeholders who operate LSTs will be identified from records the Office of the Traffic Commissioner hold on which operators hold licenses to operate LSTs and that they will be contacted directly to ask whether they will be content to take part in the study.</p>
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