

Title: 48 Tonne Intermodal Freight Trial IA No: DfT00424 RPC Reference No: N/A Lead department or agency: DfT Other departments or agencies: N/A	Impact Assessment (IA)			
	Date: 28/09/2020			
	Stage: Consultation			
	Source of intervention: Domestic			
	Type of measure: Secondary Legislation			
Contact for enquiries: IntermodalHGVConsultation@dft.gov.uk				
Summary: Intervention and Options			RPC Opinion: N/A	

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 Non-qualifying provision
£3.63m	£2.81m	-£0.74m	

What is the problem under consideration? Why is government intervention necessary?
 Six axle Heavy Goods Vehicles (HGVs) are subject to a gross vehicle weight limit of 44 tonnes. As it stands, intermodal rail freight is at a commercial disadvantage as its potential payload per journey is 15% less than the same journey carried only via road. This equates to 3.8 tonnes and is due to the additional weight of the specialised equipment required for intermodal road and rail transport. Intermodal rail freight generally emits less carbon than road freight but is hampered by this “payload penalty”. Government intervention is necessary because maximum vehicle weights are set by government, so without intervention nothing would change.

What are the policy objectives and the intended effects?
 The overall policy objective is to reduce carbon emissions and congestion caused by road freight transport, by shifting this onto rail. The interim objective is to facilitate a trial with higher payloads.
 The aims of the trial are:

- To test whether the potential benefits outlined in this Impact Assessment are realised in practice.
- Whether the proposal is technically feasible and could be rolled out on a wider basis.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)
 Do Nothing: the baseline against which other options are measured
 Option 1 (preferred): enable the trialling of 48 tonne HGVs within 50 miles of a rail terminal.

Will the policy be reviewed? Yes If applicable, set review date: 2 years after the start of the trial.				
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: -0.002

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:

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2020	Time Period Years 4	Net Benefit (Present Value (PV)) (£m)		
			Low: 3.11	High: 4.12	Best Estimate 3.63

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	£0.00	4	£0.10	£0.39
High	£0.00		£0.10	£0.39
Best Estimate	£0.00		£0.10	£0.39

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

Central Government (public sector) to Freight Operators (private sector) - costs have been calculated to assess the impact of reduced taxation revenue as a result of lower fuel consumption. This is treated as an economic transfer, not an economic cost, as this cost is saved by the freight operators and therefore has been included as a monetised cost and a monetised benefit.

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

Freight operators (private sector) - The costs from increasing the regulatory burden, reporting and familiarisation costs on operators.

Central Government (public sector) – The costs of assessing and maintaining infrastructure on trial routes as a result of the increased weight born by HGVs.

There is no enforcement cost, since this is a voluntary trial.

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	£0.00	4	£0.92	£3.50
High	£0.00		£1.19	£4.51
Best Estimate	£0.00		£1.06	£4.02

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

Freight Operators (private sector) - benefits include lower fuel usage and increasing productivity due to fewer HGVs required to deliver the same amount of freight. The fuel duty component of this benefit is an economic transfer from government, with the fuel factor cost being an economic benefit.

Central Government (public sector) – benefits include accident savings and a reduction in noise and GHG emissions resulting from a decrease in HGVs required to deliver the same amount of goods.

Central Government (public sector) to Freight Operators (private sector) - costs have been calculated to assess the impact on reduced taxation revenue as a result of lower fuel consumption. This is treated as an economic transfer, not an economic cost, as this cost is saved by the freight operators and therefore has been included as a monetised cost and a monetised benefit.

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

NA

Key assumptions/sensitivities/risks

Discount rate (%)

3.5%

A number of assumptions have been made in order to carry out the modelling. Assumptions such as trial take up percentage are indicative numbers used for the purpose of this analysis and are not evidenced. Assumptions such as 48t Marginal External Costs, average road and rail costs, average road and rail journeys and containers moved via intermodal rail freight have been evidenced but further research is needed to determine more accurate figures. Sensitivities have been included to capture a range of the costs to business and non-business. Outputs should be treated with caution and should only be used as an indication. We aim to gather more data during the consultation stage and the trial stage to form more detailed analysis post trial.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: 0.00	Benefits: 0.74	Net: -0.74	
			- 2.96

Contents

1.0 Policy Rationale	4
Problem Under Consideration.....	4
Rationale for Intervention.....	4
Options Considered.....	5
Implementation and trial conditions.....	6
2.0 Costs and Benefits	8
Introduction.....	8
Option 0 – Do nothing	8
Option 1 – Do something: increase gross vehicle weight to 48 tonnes, for journeys within 50 miles of rail depot under trial conditions	8
Summary of Analysis and Results.....	9
Forecasted Uptake.....	10
Typical Journeys via Road and Rail.....	10
Vehicle Miles Saved.....	11
Monetised Costs	12
Costs based on DfT’s Marginal External Costs (MECs) Methodology.....	12
Costs (i) Indirect Taxation (Fuel Duty Cost).....	12
Non-Monetised Costs	12
Transition Costs (ii) Review Trial Conditions.....	12
Transition Costs (iii) Trailer Replacement Costs.....	13
Ongoing Costs (iv) Accident Reporting.....	13
Ongoing Costs (v) Training Requirements.....	13
Ongoing Costs (vi) Infrastructure Costs.....	14
Ongoing Costs (vii) Road Costs.....	14
Ongoing Costs (viii) Routing Requirements.....	14
Monetised Benefits	15
Benefits based on DfT’s Marginal External Costs (MECs) Methodology.....	15
Benefits (i) Congestion.....	15
Benefits (ii) Infrastructure.....	16
Benefits (iii) Noise impact.....	16
Benefits (iv) Accidents.....	16
Benefits (v) Environment.....	16
Benefits (vi) Indirect Taxation (Fuel Duty Cost).....	16
Benefits based on the Transport Engineer Operator Costs Report.....	17
Benefits (vii) Labour Saving.....	17
Benefits (viii) Tyre savings.....	18
Benefits (ix) Repairs and Maintenance Savings.....	18
Benefits (x) Fuel Factor Cost Saving.....	18
Benefits (xi) Vehicle excise duty and road user levy.....	19
Benefits Based on the 2020 Mode Shift Revenue Support (MSRS) Grant Models.....	19
Benefits (xii) Rail Cost Savings.....	19
Non-Monetised Benefits	20
3.0 Sensitivity Analysis	20
4.0 Risks and Unintended Consequences	22
5.0 Wider Impacts	23
Small and Micro Business Assessment.....	23
Trade Impact.....	23
Competition Assessment.....	24
6.0 Post Implementation Review	24
Annex A: Full list of Further Questions	28

1.0 Policy Rationale

Problem Under Consideration

1. Six axle Heavy Goods Vehicles (HGVs) are subject to a gross vehicle weight limit of 44 tonnes. As it stands, intermodal rail freight is at a commercial disadvantage, as its potential payload per journey is 15% less than the same journey carried only via road, this equates to 3.8 tonnes. This 3.8 tonne penalty is due to the additional weight of the equipment required for intermodal road and rail transport (a steel sided swapbody container and skeletal trailer) compared to the equipment required for road transport alone (a standard curtain side trailer). This penalty can act as a disincentive to companies who may otherwise consider using rail freight transport for part of the journey, as they will be able to carry fewer goods per journey.
2. Freight transport is a significant contributor to total greenhouse gas (GHG) emissions for transport and the Government has committed to reaching net-zero emissions by 2050. Additionally, the freight industry has agreed to a 15% GHG reduction by 2025¹ (with 2015 emissions as a baseline). To meet these commitments, more sustainable forms of freight transport must be sought. However, due to the high weights and distances involved, road freight transport is a hard mode to decarbonise.
3. HGVs contribute 16% to total UK transport GHG emissions, but the emissions from rail freight are lower per mile travelled. All emissions from rail, including passenger rail, sit at around 2% of total transport emissions.²
4. Each tonne of freight transported by rail reduces carbon emissions by 76% compared to road and each freight train removes 43-76 HGVs from the roads³. The Government supports modal shift from road to rail freight and has established the Mode Shift Revenue Support (MSRS) scheme which encourages modal shift from road to rail where the costs are higher than road, and where there are environmental benefits to be gained. It currently helps to remove around 900,000 lorry journeys a year from Britain's roads.⁴ However, further action is needed to encourage wider modal shift and the reduction in emissions required.
5. The Department has been approached by Malcolm Logistics, a Scottish haulier, with a proposal to increase maximum weight limits, for HGVs transporting intermodal freight. Their proposed increase is to 48 tonnes, to offset the 3.8 tonne "payload penalty" cause by the heavier container. The Department has considered their representation and developed its own proposals for a trial, open to other operators.

Rationale for Intervention

Unintended consequences

6. The Government already intervenes in this area by setting a gross vehicle weight limit of 44 tonnes via the Construction and Use Regulations (1986). This would not be additional intervention, instead an amendment to the existing regulations.
7. There is currently commercial incentive to carry goods by road rather than rail as operators can carry 3.8 tonnes more goods per journey than they could on an intermodal road and rail trip. Intervention is required to overcome the unintended consequence of the 1986 intervention and create payload parity, increasing the commercial viability of intermodal journeys.

Reduced negative externalities

8. Intermodal journeys are more socially beneficial compared to road-only journeys due to the reduced GHG emissions. The Government has committed to reaching net-zero emissions by 2050 – and in the Road to Zero strategy set out a commitment to reducing the emissions from HGVs and road freight. Intervention by the government on this issue may help achieve these commitments.
9. A reduction in congestion is expected to lead to shorter delays, reduced travel times, and an improvement in air quality. Government intervention to support a reduction, such as the removal of HGVs from the Strategic Road Network, would bring wider societal benefits.

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/739460/road-to-zero.pdf

² https://www.gov.uk/government/statistical-data-sets/energy-and-environment-data-tables-env_ENV0201: Greenhouse_gas_emissions_by_transport_mode: United_Kingdom

³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/552492/rail-freight-strategy.pdf

⁴ [DfT monitoring of MSRS grant scheme \(unpublished\).](#)

10. These social benefits as a result of reduced GHG emissions and congestion and improved air quality do not benefit the haulier, and therefore are not factored in to the haulier's decision making process. Therefore, the haulier will pick the mode of transport that works best for them, ignoring the wider benefits. Without intervention, this means we will have less rail transport than is socially optimal.
11. As mentioned above, there are other policies in place to also help address this externality (Mode Shift Revenue Support), and this is a further reduction in the haulier cost of intermodal journeys to help achieve the socially optimal level of rail freight.

Policy Objective

12. The policy objective is initially to facilitate a trial, then to scale up shifting freight from road to rail, thereby reducing the carbon emissions and congestion caused by road freight transport.
13. The policy may not fully realise its objective if the increase in maximum permitted weights does not lead to an increase in the use of rail freight compared to road freight, by trial participants, or avoids the loss of rail freight if that would otherwise have been the case. This may be the case if other commercial factors, which discourage the use of rail freight, outweigh the benefit of the extra weight allowance.
14. Evaluation of the trial will allow us to see how far towards the objective this intervention goes.

Options Considered

15. Option 0: Do Nothing
 - a. Continue with gross vehicle weight limit of 44 tonnes for all journeys.
 - b. This policy option would not achieve the policy objective.
16. Option 1: Increase gross vehicle weight to 48 tonnes, for journeys within 50 miles of rail depot on specific routes used repetitively for loads to and from rail heads on a trial basis.
 - a. This policy option would lead to an increase of the gross vehicle weight for intermodal journeys, carried out in a 50-mile radius from a rail freight terminal, from 44 tonnes to 48 tonnes. This will create payload parity between rail and road freight.
 - b. This policy option would initially be trialled to assess if the intended outcomes of reduced road transport and an increased uptake of intermodal freight transport would be realised in practice. The trial would also allow for assessment of the operational practicalities of 48 tonne operations, particularly in relation to wear on road structures, some of which may have weight limits close to 48 tonnes.
 - c. A trial would also test in practice that 48 tonnes was an appropriate gross vehicle weight limit and that a maximal limit of 50-mile radius from a rail depot is a suitable and workable distance. The safety of the proposal would also be assessed, both in terms of incidents and the impact of 48 tonne vehicles on structures.
 - d. The type of scheme under consideration by the Department is for:
 - i. A road leg which is part of a longer journey of containerised freight involving transport by rail, where both ends of the journey are in Great Britain, or one end of the journey is in Great Britain and the freight travels by rail through the Channel Tunnel (excluding the Euroshuttle);
 - ii. The road leg would be required to have a standard, "designated" route to be followed (except in the event of severe unforeseen circumstances) which cannot be longer than 50 miles. The route would require approval from the relevant structures owners. In some respects, this is analogous to a bulk application and booking of a set of abnormal indivisible load movements (although these loads would not be indivisible and would be allowed via a different type of legal order);
 - iii. For motorways and other trunk roads in England, the presumption is that routes available routinely for category one abnormal indivisible loads (which weigh up to 50 tonnes) would be allowed to be used in a trial. In Scotland and Wales, their use would depend on the agreement of the devolved authorities. For other roads, their

use as “designated” routes would have to be agreed by the responsible local highway authorities;

- iv. The maximum legal axle loadings (including for use on public roads) for vehicles used would not change, as the higher gross weight can be accommodated within current limits. Operators would need to be approved to participate in the trial and some financial contributions to the costs of structures assessments may be sought before a trial is approved;
- v. The trial is proposed to operate over several years. Initially, there would be an opening bid round, with a view to having about five trial routes taken forward. The aim would be to consider after about two years whether the trial should be made permanent, amended, extended temporarily, or terminated at the four-year point;
- vi. The trial would be with monitoring and reporting conditions for safety and evaluation purposes, including the use of GPS, load weight monitoring, data availability for enforcement and regulatory bodies (such as DVSA, the Traffic Commissioners and the Police),
- vii. If routes became unavailable during the trial (for example due to requirements for maintenance work), alternatives could be agreed with structures owners (although if agreement couldn't be reached, vehicles would have to revert to the standard weight limit).
- viii. There would be a requirement to space departures (a preventative measure to avoid bridge wear if there is stand still traffic);
- ix. Specific weight violations related to the trial, or serious or serial violations not necessarily related to the trial could result in the trial being suspended or terminated for an individual operator.

Implementation and trial conditions

17. At the current point in time, we envisage the trial running with multiple operators engaged in intermodal journeys. We expect the trial to run for several years, however we would recommend a point of evaluation two years in, to assess progress against the success criteria to steer the future of the trial.
18. Each kilometre driven by a heavier HGV may have negative safety impacts on individuals, structures and infrastructure, however a reduction in the total number of HGV kilometres driven will lead to positive safety impacts, leading to an uncertain net effect. It will therefore be important to implement controls as part of the trial to reduce this impact. Suggested controls include:
 - a. Utilisation of specific loading models to ensure axles are not overloaded
 - b. Route planning to permit *only* specific pre-agreed routes and seeking permission of structure owners
 - i. This may also include contingency planning were there to be disruption on the route requiring diversion.
 - ii. Relevant highway authorities must approve the operator's routes before operation can commence.
 - c. Incident notification both of the heavier HGVs incident rate as well as the operator's standard fleet – this would include damage only incidents.
19. Throughout the trial, various conditions would be monitored. These conditions require monitoring to either ensure the trial is operating safely, allow evaluation of the trial after it concludes or for both purposes. Information would be anonymised before being shared publicly. This list may not be exhaustive.
20. Trial safety monitoring conditions:
 - a. GPS tracking of participating vehicles, to ensure they only use pre-agreed routes and do not operate as convoys.

- b. Load weight records to be kept for relevant journeys and available for inspection by relevant parties (the trial monitoring organisation, DVSA, Traffic Commissioners, affected structures owners etc).

21. Post-trial evaluation conditions:

- c. Monitoring of freight weights carried via intermodal rail and road versus road only by participating operators, for analysis of the effect of the extra maximum weight allowance. In order to allow a counterfactual comparison, retrospective data may be needed, this is discussed in more detail below.
- d. Fuel consumption, to allow comparison of the 48t and standard vehicles.
- e. Any increase in running costs of 48t vehicles compared to standard vehicles, for example components wearing out more quickly than usual.
- f. Any increase in staff costs, for example due to any extra training required.
- g. Any adaptation costs required to allow vehicles to operate at 48t, for example modifications to trailers.

22. Safety monitoring/evaluation conditions:

- h. Incident reporting, as described above. This is evidently important for safety monitoring, but is also key for evaluation, as a reduction in overall HGV mileage is anticipated as bringing safety benefits, but could be offset if there is an increase in incidents on the road legs to rail heads.

23. A key evaluation question is whether the increase in permitted maximum weight has a positive impact on the volume of intermodal rail freight transported by an operator. The ideal counterfactual group would be operators who also carry out intermodal freight operations, but continue with the current maximum weight limits. However, there is a limited incentive for operators to agree to data sharing without the benefits of taking part in the trial. This could lead to less diligent data collection and it may be very difficult to convince operators not permitted to use the higher weights to take part in a counterfactual group at all.
24. Further scoping work to take place during the consultation period will examine trial design and work to find the best option. A condition of the Mode Shift Revenue Support scheme is data sharing with DfT, so there is a possibility that suitable data may be available via this scheme. Alternatively, the trial could operate via a “pipeline” design. Operators taking part in the trial would be split into two groups, one starting to use 48t vehicles immediately, the other continuing with current weight limits but providing data to act as a counterfactual. This second group would then start to use 48t vehicles after two years. Whether or not this is feasible would depend on whether participation in the trial for a two-year period, after a wait of two years, would be sufficient incentive for firms to participate with the evaluation requirements for two years before joining. Another option would be to use operators for the trial that use multiple routes for rail freight journeys. Whilst one route would be subject to trial conditions and they would be able to use 48t vehicles, another would not and they would still be restricted to 44t movements. The operator would then be required to submit evidence for both routes.
25. Regardless of the final trial design, the ability to provide accurate data, of the volume of freight moved by intermodal road/rail vs road only (or number of trips if volumes are not available) will be a key requirement for trial participants. Volumes of freight moved by an operator are likely to be influenced by various factors, and clearly the economic impact of the COVID-19 pandemic, as well as any influence due to Brexit could have a significant impact on an operator. Any analysis of the volume of freight moved by road/rail versus road only, will have to account for national trends in freight movements, which are often linked to changes in the economic situation.
26. Given the expected number of vehicle movements (due to a low sample size), this trial will not be able to give a definitive answer on how safe operation of 48 tonne HGVs for intermodal freight generally would be. It may therefore be necessary to carry out further safety monitoring of a larger sample size in future, to give a more definitive answer.

2.0 Costs and Benefits

Introduction

27. This section provides a summary of the economic assessment undertaken for this stage. It provides an explanation of the methodology adopted together with the key assumptions applied and data sources utilised. The overall aim of the economic assessment is to estimate the likely cost savings (or increased costs) that would accrue to the freight transport industry, both rail and road, following the introduction of a trial on increasing gross vehicle weight to 48t HGVs traveling within 50 miles of a rail depot, including quantifying any modal shift effects between rail and road transport. Importantly, the assessment also considers rail and road transport externalities (such as congestion) on wider society and the environment arising from changes in the transport of freight due to the introduction of this policy option.
28. This assessment excludes subsidy, including the Mode Shift Revenue Support (MSRS) Grant.

Option 0 – Do nothing

29. 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 regulation whereby the maximum gross vehicle weight is maintained at 44 tonnes and there is no limit on number of miles travelled.
30. Throughout the analysis, the costs and benefits have been modelled by taking the difference in the numbers of vehicle miles travelled under the Baseline Do Nothing Scenario and under Option 1. At this stage, the level of uptake for a trial is unknown and therefore an estimated uptake has been used for the purpose of this impact assessment. The NPV will be proportionate to uptake. This means that the higher the uptake, the higher the NPV. This should not significantly change the relative costs and benefits, only the scale of the NPV.

Option 1 – Do something: increase gross vehicle weight to 48 tonnes, for journeys within 50 miles of rail depot under trial conditions

31. The trial impacts have been modelled over a 4 year appraisal period for the purposes of the Impact Assessment as the trial is likely to last a maximum of 4 years, with a review point after 2 years.
32. The annual costs and benefits remain constant over the 4 year period and it assumed that there will be no additional uptake year on year. This is a conservative estimate and we will look to have more accurate figures for the next stage of appraisal.

Summary of Analysis and Results

Table 1

£Million, 2019 Prices, 2020 PV	Low	High	Best Estimate
Benefits to Business	2.32	3.29	2.81
Benefits to Non-Business	1.17	1.21	1.21
Costs to Business	0.00	0.00	0.00
Costs to Non-Business	0.39	0.39	0.39
NPV	3.11	4.11	3.63
Business NPV	2.32	3.29	2.81
Benefits			
Business	2.32	3.29	2.81
Tyre Saving	0.02	0.03	0.02
Repairs & Maintenance Saving	0.06	0.08	0.07
Annual Labour Cost Saving	0.51	0.76	0.63
Annual Fuel Factor Cost Saving	0.68	1.02	0.85
Fixed Rail Cost Savings	0.66	1.00	0.83
Variable Rail Cost Savings	0.01	0.02	0.02
Indirect Taxation (Fuel Duty) Transfer	0.39	0.39	0.39
Non-Business	1.17	1.21	1.21
Congestion Saving	0.82	0.87	0.87
Infrastructure Saving	0.11	0.11	0.11
Accident Saving	0.04	0.04	0.04
Local Air Quality Saving	0.03	0.03	0.03
Noise Saving	0.09	0.09	0.09
Greenhouse Gases Saving	0.09	0.09	0.09
Costs			
Business	0.00	0.00	0.00
-	0.00	0.00	0.00
Non-Business	0.39	0.39	0.39
Indirect Taxation (Fuel Duty) Transfer	0.39	0.39	0.39

33. The use of 48t HGVs leads to changes in the patterns of private and societal costs and benefits, through two main channels:
- the change in articulated HGV mileage (monetised), and;
 - the change in the impact of each articulated HGV mile driven (monetised).
34. The increase in gross weight allowance from 44 tonnes to 48 tonnes will enable the same overall amount of goods to be transported with reduced overall lorry mileage given its additional capacity, allowing rail to effectively replace the miles that would've been drive by HGVs. This should deliver private benefits (e.g. reduced operating costs for hauliers) as well as social benefits (e.g. reduced congestion and emissions) which we have been able to estimate and monetise.
35. 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, road and infrastructure damage, increased maintenance costs etc.) associated with the increase in vehicle weight and it's 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 we are not certain of the scale of the additional cost per mile driven, therefore in most cases we have used the percentage increase in weight as a proxy for the increase in costs. As we develop the analysis throughout the trial stage, we expect to be able to better monetise some of these impacts, which would seek to provide a better estimate of the net private and social impacts of the additional weight allowance.
36. Whilst operators are unlikely to consider the social costs and benefits (such as road and infrastructure damage and changes in emissions), they will be exposed to the reduced operating costs and increased maintenance costs.
37. As we develop the analysis throughout the trail stage, we expect to be able to better monetise some of these impacts, which would seek to provide a better estimate of the net private and social impacts of the additional weight allowance.
38. 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.

Forecasted Uptake

39. The following forecasted uptake uses the number of intermodal container movements per year per route in the Malcolm Report⁵ as a proxy for total container movements that could be supported by the trial. We think this is a good proxy for the number of movements per year, as this data is taken from the types of operators who would be looking to engage in the trial.

Table 2

	Total	Existing Intermodal Operators (90%)	New Intermodal Operators (10%)
Case Study Container Movements per Route	1,500		
Estimated Uptake of Trial per Year (High Uptake, 10 Routes)	15,000	13,500	1,500
Estimated Uptake of Trial per Year (Low Uptake, 4 Routes)	6,000	5,400	600
Estimated Uptake of Trial per Year (Central, Average of High & Low, 7 Routes)	10,500	9,450	1,050

40. There is uncertainty around the level of uptake which will be generated in the absence of trial data, therefore we have **estimated** the uptake in containers per year based on the **number of routes that may be supported by the trial**. The NPV will be proportionate to uptake. This means that the higher the uptake, the higher the NPV. This should not significantly change the relative costs and benefits, only the scale of the NPV.

41. For the purpose of this IA, we have used the Malcolm Report Case Study⁶ as a proxy for the number of containers moved via intermodal freight per year per route. We have estimated that between 4 (low) and 10 (high) routes will be accommodated by the trial, with 1,500 container movements being carried over each of the routes per year. Of these movements, we have estimated that 90% will be by current intermodal operators, and 10% by new intermodal operators who have been attracted to intermodal freight by the trial. These are **estimations only**, and it is not known what the number of routes supported by the trial will be. We will look to have a more accurate estimate of uptake for the next stage of assessment.

We have included questions in this Impact Assessment, to help us develop a more detailed understanding of the costs and benefits of this proposal. If you are a freight operator interested in taking part in a possible trial, please answer these questions, along with those in the Consultation Document.

Question 1: How many intermodal containers per year have you moved via rail over the last 5 years?

Question 2: How many intermodal containers per year do you expect to move via rail over the next 4 years? Will this be more or less than you would expect to move if the trial does not go ahead?

Question 3: How many containers per year have you moved via road only over the last 5 years?

Question 4: How many intermodal containers per year do you expect to move via rail over the next 4 years that would have otherwise been shipped via road only? Will this be more or less than you would expect to move if the trial does not go ahead?

Typical Journeys via Road and Rail

42. We have estimated the NPV based on current industry data on typical journeys driven by articulated lorries both to rail depots and on road legs, and data on typical rail journeys. The following journeys are average long distance journeys taken by HGV's and Freight Trains (one way) and have been calculated from the Mode Shift Revenue Support Grant (MSRS) Workbooks which were produced for the MSRS Grant update in 2020, where we took an average of all zone to zone trips for both road and rail.

⁵ <https://www.malcolmgroupp.co.uk/media/2589/48t-for-48m-brochure-final.pdf>

⁶ <https://www.malcolmgroupp.co.uk/media/2589/48t-for-48m-brochure-final.pdf>

Table 3

Average Journey	Distance (Miles)
Average HGV Road Only Journey	268
Average Rail Freight Journey	318

43. The journeys below are distances of road legs from a logistics hub to a rail depot provided by the Malcolm Report⁷. We have taken an average of the 8 case study routes to estimate the number of miles on average that will be driven by 48 tonne HGVs when the trial takes place. More accurate estimates will be sought for the next stage of assessment.

Table 4

Road Leg Journey from Logistics Hub to Rail Depot	Distance (Miles)
Cowie to Grangemouth (Malcolm Case Study)	12
Irvine to Grangemouth (Malcolm Case Study)	59
Shieldhall to Grangemouth (Malcolm Case Study)	34
Level to Grangemouth (Malcolm Case Study)	44
Cowie to Mossend (Malcolm Case Study)	29
Irvine to Mossend (Malcolm Case Study)	44
Shieldhall to Mossend (Malcolm Case Study)	20
Leven to Mossend (Malcolm Case Study)	56
Average Miles Travelled to a Rail Depot	37.25

Question 5: How many miles is the route that the 48t HGV will travel from warehouse to rail depot at each end?

Question 6: If you move(d) goods via road only, how many miles is each typical journey from origin to destination?

Question 7: How many miles is travelled via rail for each typical journey from origin to destination?

Vehicle Miles Saved

44. In order to estimate vehicle miles saved, we have assumed that operators still transport the same amount of goods before and during the trial. As operators will be able to carry an additional 4 tonnes of goods per journey (and it has been assumed that all operators choose to operate full payloads on all journeys), it will take less vehicle miles to carry the same amount of goods to and from rail depots. The miles saving is higher for new intermodal operators than for current, as new intermodal operators are expected to substitute longer road journeys for intermodal rail journeys. As the assumption that all operators choose to operate full payloads is not backed up by evidence, this could be an overestimate, but we will seek further clarification on payloads during the trial.

45. The reduction in HGV Miles per Year has been estimated using average journey data and takes into account the increased weight that each HGV can carry per journey, which results in the same amount of goods being transported via less journeys. It has been assumed that all operators will transport the same weight of goods per year as they would have done without the trial, and therefore the reduction in mileage comes from a reduced number of HGV journeys to rail depots from current intermodal operators and the substitution of road legs to road and rail legs from new intermodal operators.

Table 5

	Total	Existing Intermodal Operators (90%)	New Intermodal Operators (10%)
Estimated Reduction in HGV Miles per Year (High Uptake, 10 Routes)	518,521	162,874	355,646
Estimated Reduction in HGV Miles per Year (Low Uptake, 4 Routes)	207,408	65,150	142,258
Estimated Reduction in HGV Miles per Year (Central, 7 Routes)	362,964	114,012	248,952

⁷ <https://www.malcolmgroupp.co.uk/media/2589/48t-for-48m-brochure-final.pdf>

Question 8: How many tonnes of goods on average per journey did you transport over the last year?

Question 9: How many tonnes of goods per journey on average do you expect to transport under trial conditions?

46. Overall, the trial is expected to reduce overall road mileage by HGV vehicles which will contribute to a number of benefits to both business and non-business which are outlined later on in the impact assessment. There are, however, some costs associated with the trial and these have been discussed in more detail below.

Monetised Costs

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

47. The following economic cost (i) is based on the Department's 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 indirect tax MEC is provided in the table below for each 5-year period. These have been linearly interpolated to find intermediary year benefits.

Table 6

MEC Values Arctics (pence/mile, 2019 prices)	2020	2025	2030	2035	2040
Indirect Taxation	-35.26	-35.88	-37.14	-38.08	-37.31

Costs (i) Indirect Taxation (Fuel Duty Cost)

48. 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. This cost is a transfer between Government and business.

49. The reduction in miles associated with the increase in vehicle weight allowance leads to a lower amount of trailer miles being travelled and less fuel consumed. Calculating this with the rates provided by the MECs method leads to a reduction in the indirect taxation revenue for Government, and a reduction in indirect taxation costs for freight operators.

50. This cost would be greater for any trial participants new to intermodal freight, as the HGV miles foregone for these operators would be much greater than for those already operating domestic intermodal routes.

51. This is an economic transfer and therefore any increase in costs here would result in an equal increase in benefits. Therefore, this has been included as both a monetised cost and a monetised benefit, but it does not impact the NPV.

Non-Monetised Costs

Transition Costs (ii) Review Trial Conditions

52. It has been assumed that all operators who operate large volumes of repeat loads on fixed routes to rail heads will consider whether to take part in the trial or not and therefore face a familiarisation cost. These costs are likely to arise from a single/group of individuals within an organisation to review the trial conditions and will have some time cost resulting from this. Costs for this are unmonetised at this stage.

53. There is no specific data on the number of operators which operate large volumes of repeat loads on fixed routes to rail heads, and therefore it is unknown how many operators would review trial conditions and apply to trial.

54. Given the detail around the trial conditions, it is assumed this will take around 1 day to complete. This is made up of the following activities:

- a. Review and understand the trial conditions.

- b. Identifying the business needs for using 48t loads going forward – assessing those business areas where the 44t weight limit is reached but are running with load capacity. This would also feature understanding whether the route on proposed road leg journeys to rail heads will be able to accommodate 48t loads.
- c. Understanding the specifications of the trailers – understanding specifics around the trailer design, and whether the operator's current fleet can carry an additional 4t of weight without needing to be modified.

55. We have deemed it disproportionate to monetise due to the small number of operators and low impact of the policy. As this is deregulatory, if the businesses deem the administrative cost to be greater than the benefit then they would be able to continue using 44t HGVs. The trial will evaluate how many operators apply to trial and the consultation questions below will enable us to monetise the costs. This will be used to assess familiarisation costs at a later stage if the trial is rolled out on a wider basis.

Question 10: Is the time taken to review the trial conditions reflective of the expected time taken to carry out these tasks? If not, what would be a reasonable estimate for the number of days?

Question 11: Is the estimated number of operators in scope reflective of the actual number of operators in scope? If not, how many operators would be expected to review the trial conditions?

Question 12: What employees do you expect to be involved with the review of the trial conditions? How many hours would you expect each individual in your organisation to take to review? e.g. how many hours for each employee (e.g. director, transport manager, admin staff). What is the average wage for each of these types of employees?

Transition Costs (iii) Trailer Replacement Costs

56. It is not expected that there will be any costs associated with replacing trailers to carry the additional load as most existing trailers will already be able to cope with a gross weight of 48t. Any operators that have trailers that can not carry the additional load are not expected to participate in the trial.

57. We will seek further clarification on this during consultation.

Question 13: Do you anticipate there being any costs associated with upgrading or replacing your existing fleet or trailers to be able to carry the additional weight? If so, how much will it cost per trailer and how many trailers would this impact?

Ongoing Costs (iv) Accident Reporting

58. During the trial, 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.

59. 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 HGVs operating with additional weight allowance on particular routes. The Department will monitor the impact on accident rates on an ongoing basis during the trial 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 next stage impact assessment.

Ongoing Costs (v) Training Requirements

60. It is possible that some operators would deem it necessary to provide employees operating heavier vehicles with some training before they begin operating with 48t loads. Based on evidence discovered throughout the Longer Semi Trailer (LST) trial, most small to medium operators provided

high-level training to employees during the trial period. 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. Nevertheless, driver training was an LST trial condition and it is therefore expected that the training uptake for 48t will be lower.

61. We will seek to determine the costs associated with training in two different variations for the next stage of assessment:

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

Question 14: Do you anticipate that you would have to provide training to employees? If so, what would you expect the cost of this to be per employee?

Question 15: If yes, how long would you expect the training length to be?

Question 16: If yes, who will deliver this training? Will it be in house, or will you source an external company?

Question 17: If yes, do you expect to deliver this training on a one to one basis or a group basis? If a group, how many would you expect to deliver to at any one time?

Ongoing Costs (vi) Infrastructure Costs

62. The trial would operate only on routes where infrastructure could accommodate the 48 tonne load. Even here the extra loading may accelerate the need for maintenance work on specific structures. The way any such costs arising should be met is discussed in the consultation document. Currently, the proposal is for any costs related to structures maintenance to be met by DfT, with a possible contribution from the operator wishing to use the structure in question. Road structures may also require inspection during the trial, to ensure the higher weights are not adversely affecting them. Again, how the costs of these inspections should be met is discussed in the consultation document and a final decision has not yet been made. Participating operators may be asked to contribute to the cost of structures inspections, the necessity of this will depend on the individual route. Clearly, choosing routes which avoid problematic structures which may require inspections would be preferable, even if this means a slightly longer route is used.

63. We will seek further evidence on costs to infrastructure for the next stage of assessment.

Ongoing Costs (vii) Road Costs

64. It is unknown whether the increased gross weight of containers will increase road costs due to additional burden on trailers / tyres etc. For the purpose of this IA, the road costs associated with 48t trailers are assumed to be 9% higher than for 44t trailers (which is the percentage increase in weight), however this will be monitored in the trial stage to form a more informed view at the next stage of assessment.

Ongoing Costs (viii) Routing Requirements

65. When an operator is planning to apply to take part in the trial, the Department would reasonably expect them to be reviewing whether the proposed routes are suitable for travelling on. Further to that, during the trial they need to be continuously assessing whether roadworks may adversely affect planned routes and consulting with the Department on alternative routes during that period. Given the potential impacts surrounding the heavier trailers, the Department would expect operators to take more time to assess the routes than for standard trailers given the additional weight and potential impact on infrastructure, 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. The form this planning might take would vary depending on the size of the fleet and the repetitiveness of the operational patterns.

66. We will seek further clarification on costs involved with this during consultation.

Question 18: How long do you anticipate it will take to scope out proposed routes for your fleet to and from a rail depot?

Question 19: During the trial, do you expect that there would be additional time associated with carrying out the route risk assessments / re-routing than already considered for standard trailers? If so, how much longer would you expect this to take?

Monetised Benefits

67. Several benefits have been modelled for this analysis which are proportional to the trial 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 next stage.

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

68. The following benefits (i) to (vi) are based on the Departments MECs methodology as outlined in Transport Appraisal Guidance 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.

Table 7

MEC Values (pence/mile, 2019 prices)	2020	2025	2030	2035	2040
Congestion	62.82	71.51	86.96	99.97	120.15
Infrastructure	17.37	18.36	20.00	22.05	24.42
Accidents	3.26	3.46	3.78	4.15	4.58
Local Air Quality	2.26	1.92	2.01	2.29	2.38
Noise	7.81	8.28	9.03	9.88	10.86
Greenhouse Gases	7.77	8.17	8.69	12.40	16.05
Indirect Taxation	-35.26	-35.88	-37.14	-38.08	-37.31

69. 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.

Benefits (i) Congestion

70. The removal of HGV traffic would lead 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.

71. 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 next stage and an assessment sought.

Benefits (ii) Infrastructure

72. The removal of HGV traffic could lead to a reduced infrastructure impact on structures given the decreased number of vehicles using the road and the resulting amount of wear and tear on some sections.
73. However, the vehicles would be carrying higher weights and therefore would likely increase the wear and tear on some structures used for the trial routes. Some of the costs associated with this are explained in the cost section of this IA. For trial impact assessment stage, using the 4th power law, we have assumed a 48 tonne HGV would do 42% more damage than a 44 tonne HGV, assuming there was no increase in the number of axles. We will investigate how best to capture a true value within the modelling for the next stage of this analysis.

Benefits (iii) Noise impact

74. The removal of HGV traffic would lead to a reduced noise impact given the decreased number of vehicles using the road and the resulting amount of noise generated by all vehicles using the road. This presents a benefit to wider society as there is reduced amounts of noise being experienced by all other individuals.
75. However, the vehicles would be carrying higher weights and therefore would likely increase the noise generated from their usage. For trial impact assessment stage, we have assumed that the noise generated by 48t vehicles is 9% higher than 44t vehicles, which is the % increase in the gross weight of the HGV (48/44). We will investigate how best to capture a true value within the modelling for the next stage of this analysis.

Benefits (iv) Accidents

76. The removal of HGV traffic could lead to a reduced accident impacts given the decreased number of vehicles using the road and the resulting amount of traffic experienced by all vehicles using the road.
77. However, the vehicles would be carrying higher weights and therefore could likely increase the frequency/severity of accidents generated from their usage. For trial impact assessment stage, we have assumed that the noise generated by 48t vehicles is 9% higher than 44t vehicles, which is the % increase in the gross weight of the HGV (48/44). We will investigate how best to capture a true value within the modelling for the next stage of this analysis.

Benefits (v) Environment

78. 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 increase in available load that a vehicle can transport leads to less 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.
79. However, there vehicles would be carrying higher weights and therefore would likely increase the emissions generated from their usage. For trial impact assessment stage, we have assumed that the noise generated by 48t vehicles is 9% higher than 44t vehicles, which is the % increase in the gross weight of the HGV (48/44). We will investigate how best to capture a true value within the modelling for the next stage of this analysis.
80. Throughout the trial, freight operators using 48t loads will be required to report on the number of miles saved, and through modelling, the estimated emissions savings can be calculated.

Benefits (vi) Indirect Taxation (Fuel Duty Cost)

81. 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. This cost is a transfer between Government and business.
82. The reduction in miles associated with the increase in vehicle weight allowance leads to a lower amount of standard trailer miles being travelled and less fuel consumed. Calculating this with the rates provided by the MECs method leads to a reduction in the indirect taxation revenue for Government, and a reduction in indirect taxation costs for freight operators.

83. This cost would be greater for any trial participants new to intermodal freight, as the HGV miles foregone for these operators would be much greater than for those already operating domestic intermodal routes.
84. This is an economic transfer and therefore any increase in costs here would result in an equal increase in benefits. Therefore, this has been included as both a monetised cost and a monetised benefit, but it does not impact the NPV.

Benefits based on the Transport Engineer Operator Costs Report

85. The following on-going benefits have currently been indicatively monetised based on the costs outlined in the Transport Engineer Operator Costs⁸ Report, however we have included questions in the call-out boxes below to seek 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, we have taken 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, but we have taken the annual costs per trailer and divided by the number of miles to calculate the cost per mile. However, this might present some inaccuracy and uncertainty given the costs are often not perceived in this way. We will investigate alternative options to model these to provide a more accurate representation of the benefits derived from fixed cost savings at a later stage.
86. We have calculated the benefits based on the average miles travelled by the average articulated vehicle and assumed, for costs other than labour, that the increase in cost as a result of carrying an additional 4 tonnes is proportional to the increase in weight (9% higher per mile) This is proportionate for this stage, however we will need to seek clarification on this during later the trial.

Benefits (vii) Labour Saving

87. Due to the expected reduction in the number of HGV miles because of the introduction of 48 tonne weight allowances, there will 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.
88. 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 an 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, but as these are not guaranteed we have not included these in the analysis. These can then be divided by the average annual mileage to arrive at the below rate of £0.27 per km. Details on the specific values are provided in the table below.

Table 8

Metric	Value
HGV driver salary per year	£37,184
Annual vehicle km travelled	136,794
HGV driver salary per vehicle KM	£0.27

89. 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 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.

⁸ http://www.transportengineer.org.uk/article-images/199509/Operator_costs.pdf

Question 20: 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 21: Is 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 22: 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 23: Are the annual running costs the same for vehicles carrying 48 tonnes as the current standard trailers? If not, by what percentage are these different?

Question 24: Are there any costs involved with adapting trailers to carry 48 tonnes, or buying suitable new trailers?

Table 9

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

Benefits (viii) Tyre savings

90. Due to the reduction in travel associated with increasing the amount of weight a vehicle can carry, 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 have been calculated on a per km basis for the purposes of this impact assessment (see below).

91. For trial impact assessment stage, we have assumed that the tyre costs for 48t vehicles are 9% higher than for 44t vehicles, which is the % increase in the gross weight of the HGV (48/44). This is an estimate and we will seek clarification on this during trial.

Question 25: Do you anticipate increased tyre costs associated with operating 48t vehicles due to the increased weight? If so, how much more expensive would you expect this to be per trailer each year?

Benefits (ix) Repairs and Maintenance Savings

92. 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 using the average number of miles per HGV. For trial impact assessment stage, we have assumed that the repair and maintenance costs for 48t vehicles are 9% higher than for 44t vehicles, which is the % increase in the gross weight of the HGV (48/44). This is an estimate and we will seek clarification on this during trial.

Question 26: Do you anticipate increased/decreased repair and maintenance costs while carrying additional weight? If so, how much do you expect this to increase/decrease by?

Benefits (x) Fuel Factor Cost Saving

93. 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. These are calculated on a per mile basis using the average number of miles per HGV, and we have assumed the increase in fuel costs for a 48 tonne HGV are proportional to the increase in weight from a 44 tonne vehicle, given the additional weight they will be required to carry,. This is an estimate and we will seek clarification on this during trial.

Question 27: Do you expect increased/decreased fuel costs while carrying additional weight? If so, how much do you think this would be?

Benefits (xi) Vehicle excise duty and road user levy

94. 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 this policy and an anticipated reduction of vehicle use, we anticipate there are savings to be gained from paying less of these taxes. At this stage, however, we have assumed there are no savings and we will seek further clarification on this.

Question 28: Would the introduction of this policy result in a reduction in your fleet size and thus a reduction in VED and RUL? If so, how much would the fleet reduce by and thus how much would VED and RUL be reduced by?

Benefits Based on the 2020 Mode Shift Revenue Support (MSRS) Grant Models

95. The following on-going benefits (xii) have currently been indicatively monetised based on the rail costs outlined in the Mode Shift Revenue Support Models (both Port and Domestic) that were used in the 2020 update of the Mode Shift Revenue Support Grant⁹.

96. Rail cost data is comprised of rail fixed costs and variable costs. These are made up of the following

a) Fixed costs:

- Locomotive provision (annual leasing and maintenance, employment and other costs);
- Wagon provision (leasing and maintenance costs);
- Terminal handling (assessed as a standard per container handling charge);
- Port shunt or swap body cost (port and domestic model respectively);
- Local distribution (assessed as a fixed delivery charge based on an average delivery distance).

b) Variable costs:

- Traction (assumes diesel fuel); and
- Track Access Charge

97. For the purpose of this Impact Assessment, we have taken the average fixed cost per container and the average variable cost per container km provided in the models and calculated the average rail cost per tonne per journey transported via rail. However, this might present some inaccuracy and uncertainty given the costs are often not perceived in this way. This is proportionate at this stage, however we will need to collect more data and investigate alternative options to model these to provide a more accurate representation of direct rail costs to business at a later stage.

Benefits (xii) Rail Cost Savings

98. It is anticipated that rail costs will decrease for operators already using rail freight to transport their goods. The increase in gross weight of containers will result in fewer rail journeys needed to transport the same amount of goods, which will result in a decrease in rail costs per tonne associated with these journeys.

99. If trial conditions encourage road operators to shift to intermodal, using the MSRS Grant Spreadsheets to calculate an average number of miles per freight journey and average fixed and variable rail costs per container, it is estimated that there will be an increase in operator rail costs associated with this. It is expected that this trial alone will not be enough of an incentive to entice road operators to shift their domestic operations onto rail. However, with the additional Mode Shift Revenue Support Grant available, it may be the additional incentive needed to encourage some operators to move their domestic operations to intermodal.

100. It is not expected that many new intermodal operators will take part in the trial and we have estimated that 10% of uptake is from these operators. Therefore, overall, it is anticipated that there will be a net decrease in rail costs associated with this trial.

⁹ <https://www.gov.uk/government/publications/freight-grants-review-2019-to-2020>

101. We will monitor the type of operators that apply to trial to assess whether any operators that do not currently operate intermodal freight have been encouraged to do so by this trial and the potential rail cost implications of this.

Non-Monetised Benefits

102. No non-monetised benefits have been identified at this stage.

3.0 Sensitivity Analysis

103. 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. These are summarised in the table below and explained in further detail in the high and low NPV sections below.

Table 10

	Central (Best Estimate)	Low NPV	High NPV
Marginal External Costs (MECs)	Central DfT MECs	Low DfT MECs	High DfT MECs
Annual Cost Savings	Central DfT estimate	Central minus 20%	Central plus 20%
Uptake	7 Routes	4 Routes	10 Routes

Sensitivity Analysis Low NPV

104. 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 (which are presented below) and cost savings being 20% less than the core scenario.

Table 11

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
Accident	3.26	3.46	3.78	4.15	4.58
Local Air Quality	2.25	1.92	2.00	2.28	2.36
Noise	7.81	8.28	9.03	9.89	10.87
Greenhouse Gases	7.77	8.15	8.66	12.33	15.93
Indirect Taxation	-35.22	-35.79	-37.00	-37.87	-37.03

Sensitivity Analysis High NPV

105. For the high scenario, a reasonable best-case scenario is presented to understand what an acceptable upper range for the NPV could look like and what drives these changes. This scenario includes the high valuation for the MECs which have been estimated by the Department using the NTM (which are presented below) and cost savings being 20% more than the core scenario.

Table 12

MEC Values (pence/mile, 2019 prices)	2020	2025	2030	2035	2040
Congestion	62.81	71.73	88.23	104.75	140.86
Infrastructure	17.37	18.36	20.00	22.05	24.43
Accident	3.26	3.46	3.78	4.15	4.58
Local Air Quality	2.26	1.91	1.97	2.30	2.38
Noise	7.81	8.28	9.03	9.88	10.86
Greenhouse Gases	7.77	8.17	8.70	12.43	16.12
Indirect Taxation	-35.28	-35.93	-37.39	-38.16	-37.48

Sensitivity Analysis High Uptake

106. For this scenario, we have assumed that the amount of uptake is at the high assumed level (10 routes) and this is presented to understand the impact of a higher than anticipated uptake of trialist operators. The results for this can be found below:

Table 13

£Million, 2019 Prices, 2020 PV	Low	High	Best Estimate
Benefits to Business	3.32	4.70	4.01
Benefits to Non-Business	1.67	1.73	1.74
Costs to Business	0.00	0.00	0.00
Costs to Non-Business	0.56	0.56	0.56
NPV	4.44	5.88	5.19
Business NPV	3.32	4.70	4.01
Benefits			
Business	2.76	4.70	4.01
Tyre Saving	0.02	0.04	0.03
Repairs & Maintenance Saving	0.08	0.12	0.10
Annual Labour Cost Saving	0.72	1.08	0.90
Annual Fuel Factor Cost Saving	0.97	1.45	1.21
Fixed Rail Cost Savings	0.95	1.42	1.19
Variable Rail Cost Savings	0.02	0.03	0.02
Indirect Taxation (Fuel Duty) Transfer	0.56	0.56	0.56
Non-Business	1.67	1.73	1.74
Congestion Saving	1.18	1.24	1.24
Infrastructure Saving	0.16	0.16	0.16
Accident Saving	0.05	0.05	0.05
Local Air Quality Saving	0.04	0.04	0.04
Noise Saving	0.12	0.12	0.12
Greenhouse Gases Saving	0.12	0.12	0.12
Costs			
Business	0.00	0.00	0.00
-	0.00	0.00	0.00
Non-Business	0.56	0.56	0.56
Indirect Taxation (Fuel Duty) Transfer	0.56	0.56	0.56

Sensitivity Analysis Low Uptake

107. For this scenario, we have assumed that the amount of uptake is at the low assumed level (4 routes) and this is presented to understand the impact of a lower than anticipated uptake of trialist operators. The results for this can be found below:

Table 14

£Million, 2019 Prices, 2020 PV	Low	High	Best Estimate
Benefits to Business	1.33	1.88	1.60
Benefits to Non-Business	0.67	0.69	0.69
Costs to Business	0.00	0.00	0.00
Costs to Non-Business	0.22	0.22	0.22
NPV	1.77	2.35	2.08
Business NPV	1.33	1.88	1.60
Benefits			
Business	1.33	1.88	1.60
Tyre Saving	0.01	0.01	0.01
Repairs & Maintenance Saving	0.03	0.05	0.04
Annual Labour Cost Saving	0.29	0.43	0.36
Annual Fuel Factor Cost Saving	0.39	0.58	0.48
Fixed Rail Cost Savings	0.38	0.57	0.47
Variable Rail Cost Savings	0.01	0.01	0.01
Indirect Taxation (Fuel Duty) Transfer	0.22	0.22	0.22
Non-Business	0.67	0.69	0.69
Congestion Saving	0.47	0.50	0.50
Infrastructure Saving	0.06	0.06	0.06
Accident Saving	0.02	0.02	0.02
Local Air Quality Saving	0.01	0.01	0.01
Noise Saving	0.05	0.05	0.05
Greenhouse Gases Saving	0.05	0.05	0.05
Costs			
Business	0.00	0.00	0.00
-	0.00	0.00	0.00
Non-Business	0.22	0.22	0.22
Indirect Taxation (Fuel Duty) Transfer	0.22	0.22	0.22

4.0 Risks and Unintended Consequences

108. It is not anticipated that the policy will be hard to enforce, as this is a research trial that operators will have to apply to be part of. The planned monitoring will ensure operators abide by the trial conditions, such as sticking to pre-agreed routes, not overloading vehicles and reporting incidents accurately. If operators do not abide by these conditions, they may be removed from the trial. If serious or sustained breaches occur, enforcement action by DVSA or the Traffic Commissioners may be considered.

109. Due to the higher weight of the 48 tonne vehicles, there may be changes to handling characteristics or stopping distances. It is anticipated that drivers will be able to adapt their driving style to manage these changes. Accurate incident reporting will be one of the trial conditions, so whether the accident rate changes as a result of the higher weight will become clear during trial evaluation.

110. The benefits of the policy rely on operators using the additional permitted weight to reduce the number of road journeys they carry out, by making intermodal movements more cost effective. Given that a freight operator approached the Department with this rationale, it is anticipated that this will be the case. However, there is still uncertainty regarding the real-world impacts, the trial and subsequent evaluation will explore if these benefits are realised in practice.

5.0 Wider Impacts

Small and Micro Business Assessment

111. Currently no quantitative analysis has been undertaken to assess the possible impacts for the small and micro business assessment (SAMBA) as we are still pre-trial stage. We have included questions below which will allow us to estimate the quantitative impacts for the final stage impact assessment.

Question 29: How many 48 tonne load bearing vehicles do operators with less than 10 employees intend to use in the trial?

Question 30: How many 48 tonne load bearing vehicles do operators with less than 50 employees intend to use in the trial?

Question 31: Are either of these operators (with less than 50 employees) subject to higher costs than those which have been assessed in this consultation document?

112. The Business Population estimates 2019¹⁰ 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.

Table 15

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

113. We will need to collect data on the size of businesses that are taking part in the trial to see the total share of small and micro business taking part. There may be some potential barriers to small and micro businesses partaking in the trial such as:

- 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;
- The data collection and submission may be too burdensome on small and micro operators which deters them from using;
- Larger businesses are more likely to carry higher capacities of goods through regular route(s) to yield the business savings associated with operating 48 tonne vehicles.

114. Although the trial does not intentionally disadvantage or act as a barrier to small and micro businesses, there may be some elements of operating a 48 tonnes vehicle which they might struggle with or incur additional costs compared to larger businesses. Where possible, these will be mitigated through the design of the regulatory change, though throughout the trial consultation the views of small and micro businesses will be sought to provide further clarity of the impacts.

Trade Impact

115. 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

¹⁰ Table 7, Code 495, <https://www.gov.uk/government/statistics/business-population-estimates-2019>

the first two requirements, the introduction of the 48x48 trial in this impact assessment will have no impact on the value or trade and investment flows with other countries.

116. For the final point, the proposed regulatory change does not align with foreign policies and foreign businesses who operate in or from the United Kingdom to other countries won't be able to make use of the regulatory relaxation. Hauliers that both operate domestically and internationally won't be able to make use of the trial for international journeys given the differentials in the regulatory regimes, however they could take part in the trial for domestic operations. Given this is a deregulatory change, hauliers can choose to take part in the trial 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 benefit domestic-only hauliers, this would not act as a barrier to trade as business can continue as it does under the current regulatory regime.

Competition Assessment

117. This trial may have some impacts on competition within the freight market. Although the trial is open to new entrants, it is anticipated that in the trial stage the majority of uptake will be from businesses already operating intermodal freight. The additional weight allowance afforded to businesses taking part in the trial is estimated to lower the cost of intermodal rail freight compared with road freight, which may disproportionately advantage those operating intermodal rail freight compared with those who aren't. The uptake of new and existing intermodal freight operators will be monitored throughout the trial to better understand the uptake and how the trial impacts competition.

6.0 Post Implementation Review

118. The proposal is for a trial of the use of 48t vehicles for intermodal freight transport. During the trial, vehicles and operators will be monitored, to build a more accurate picture of how these vehicles are used and the costs/benefits. It is anticipated a technical consultancy will be contracted to carry out monitoring and evaluation, in a similar way to the Longer Semi Trailer trial. This consultancy will be responsible for monitoring and evaluating the incoming data, as well as flagging any urgent safety concerns to DfT, for example overloading of vehicles.
119. The trial will also help provide more information on other practical and commercial considerations, if this policy were to be rolled out more widely. For example adaptation costs to participants, or highlighting if there are other practical and commercial issues, which hinder the effective use of these vehicles. Trial participants will be able to provide feedback to the monitoring organisation, to bring these types of issues to their attention.
120. The intention is for the trial to run for around four years. After around two years of the trial, a decision would be taken about whether to make the trial permanent, amend it, to continue the trial period, or terminate the trial after four years. A review would be carried out to inform this decision. This review would cover the costs/benefits outlined in this impact assessment, as well as any emerging evidence from the trial itself. At this stage, the length of the trial has not been finalised and there is a question about this in the consultation document. If respondents believe that an alternative length (and/or review point) would be more appropriate, they should outline their proposals and reasoning in their consultation response.

1. Review status:

<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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The length of the trial and at what stage it will be reviewed are asked about in the consultation document. It is proposed that a review into the trial will be carried out two years into the planned four year duration. If the change in maximum weight limits is made permanent (either after two years or after the full duration of the trial) a further review may be conducted.

2. Expected review date:

NA		/	NA		Two years after start date of the trial.
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Rationale for PIR approach:

Describe the rationale for the evidence that will be sought and the level of resources that will be used to collect it.

Evidence needs to be collected for two reasons: to ensure the trial is operating safely and to allow for the costs and benefits of the trial to be evaluated. Evidence for both of these factors will contribute to a decision as to whether to continue the trial, stop it or whether to roll out the operation of 48t intermodal HGVs more widely (possibly for a wider trial with a larger number of operators). The most significant concern is safety. If even this limited trial causes problems with structures or an increased incident rate, then clearly any further trials or roll out may not be possible. This trial also needs to demonstrate that the anticipated net benefits (which are primarily environmental) are realised in practice. If real world operation data does not show that these benefits are realised, then the case for change is not there.

Trial participants will be required to submit data to the monitoring organisation at regular intervals, potentially along with some retrospective data to allow for evaluation of the effects of trial participation on volumes of freight moved by intermodal road/rail versus road only. This will require some resource at the trial participants to collect and submit. However, many freight operators (and in particular the larger operators likely to be interested in taking part in a trial) already use telematics systems which can monitor many of these criteria, so this should not present a significant extra challenge.

The use of retrospective data from each participating operator (or the possibility of using alternative trial designs to give a counterfactual) is discussed in more detail in the implementation section. While the ideal scenario would be for a comparison group of operators who carry out intermodal freight transport but did not take part in the trial, there is little incentive for them to agree to data sharing, if they are not able to access the higher weight limit. We consider the next best option may be to ask for retrospective data from each participating operator. However, further scoping work to take place during the consultation stage will examine potential trial designs, such as a pipeline design or collecting data from operators on more than one route, and how the most reliable data can be sourced. Freight movements will be affected by national economic issues (in particular the COVID-19 pandemic), so data will need to be presented in this context. If retrospective data is used, the data series will also ideally extend back for the equivalent duration of the trial (we are proposing four years at present) to ensure it is a robust comparison.

Will the level of evidence and resourcing be low, medium or high? (See Guidance for Conducting PIRs)

The level of evidence will be high, as we will be collecting extensive amounts of primary data, both quantitative and qualitative. An external provider will be contracted to carry out monitoring and evaluation of the trial, in a similar manner to the Longer Semi-Trailer Trial. This will require a medium level of resourcing at DfT initially, to set up the tendering process and after the trial starts due to contract management. It will also require financial resource.

What forms of monitoring data will be collected?

Three types of data be collected, related to either safety, post-trial evaluation or both factors. Most of these will be analysed at the review point (whenever this takes place). However, incident reporting, any serious impacts on structures (which could cause a route to become unviable) and load weight monitoring (to flag overloading) will need to be tracked during the trial, to ensure it is operating safely.

Trial safety monitoring conditions:

- a. GPS tracking of participating vehicles, to ensure they only use pre-agreed routes and do not operate as convoys.
- b. Load weight records to be kept for relevant journeys and available for inspection by relevant parties (the trial monitoring organisation, DVSA, Traffic Commissioners, affected structures owners etc).

Post-trial evaluation conditions:

- c. Monitoring of freight weights carried via intermodal rail and road versus road only by participating operators, for analysis of the effect of the extra maximum weight allowance. In order to allow a counterfactual comparison, retrospective data may be needed, this is discussed in more detail in the implementation section. Alternative trial designs may require monitoring while operators are still limited to 44t vehicles.
- d. Fuel consumption, to allow comparison of the 48t and standard vehicles.
- e. Any increase in running costs of 48t vehicles compared to standard vehicles, for example components wearing out more quickly than usual.
- f. Any increase in staff costs, for example due to any extra training required.
- g. Any adaptation costs required to allow vehicles to operate at 48t, for example modifications to trailers.

Safety monitoring/evaluation conditions:

- h. Incident reporting, as described above. This is evidently important for safety monitoring, but is also key for evaluation, as a reduction in overall HGV mileage is anticipated as bringing safety benefits, but could be offset if there is an increase in incidents on the road legs to rail heads.
- i. The impact of the trial on road structures or surfaces. For example, if there is an acceleration to standard maintenance schedules due to quicker than normal road wear.

What evaluation approaches will be used? (e.g. impact, process, economic)

Process evaluation. A key element of the trial is determining whether operation of 48t vehicles is technically feasible and bringing to light other implementation issues. While we have tried to anticipate issues, it is likely further practical considerations will be discovered either prior to or during the trial. We have already contacted structures owners on the example routes suggested in the Malcolm Logistics proposal and in most cases, these routes are feasible even where they are not on main roads. However, the routes suggested by other operators for a trial may not be acceptable for structures owners. Process evaluation will also allow for the safety of allowing this change more generally to be assessed. If there are safety issues arising during the trial (where operators know there is greater scrutiny) then permitting the change more widely may be deemed too risky.

Impact evaluation. Trial participants will be required to monitor various criteria, in order to allow for the real-world costs and benefits of allowing 48t vehicles to be evaluated. While this impact assessment has found that there may be a net benefit from allowing 48t vehicle operation, robust, real world data is necessary. This will contribute to a decision on whether to continue with the trial, to allow 48t vehicles more widely or whether to just end the trial.

3. How will stakeholder views be collected? (e.g. feedback mechanisms, consultations, research)

This is a research trial, so participants will be able to express views during the trial and report back to the monitoring organisation on further costs/benefits, or other impacts of taking part. Freight operators and other interested parties are also able to respond to the consultation. The consultation asks general questions about a trial, with further, more detailed questions for potential trial participants in this impact assessment. Given the relatively low numbers of trial participants expected, individual responses can be

evaluated and considered. Structures owners will be consulted prior to trial routes being approved and will have the opportunity to refuse routes, if structures along that route would not be able to carry the additional weight.

Key Objectives, Research Questions and Evidence collection plans

Key objectives of the regulation(s)	Key research questions to measure success of objective	Existing evidence/data	Any plans to collect primary data to answer questions?
<p>Allow the trial to take place, to determine whether the anticipated benefits are realised and highlight whether this change is practically feasible. Both of these elements would provide evidence as to whether these changes should be rolled out more widely.</p>	<ol style="list-style-type: none"> 1. Did the trial lead to an increase in the volume of freight moved by road/rail versus road only at participating operators? 2. If so, was this purely an increase in road/rail freight, or was it instead of road freight? 3. Were structures able to hold the additional weight without issues for structures owners? 4. Were there extra costs for operators to engage in the trial, if so what were these costs? 5. Did participation in the trial result in fewer HGV journeys being required to move an equivalent volume of cargo? 6. Did participation in the trial have any impact on driver shortages? 	<p>MECs gives a robust picture of the relative costs/benefits of moving freight by different modes.</p>	<p>Yes, this trial will be collecting primary data to provide evidence to answer all of these questions.</p>

Annex A: Full list of Further Questions

1. How many intermodal containers per year have you moved via rail over the last 5 years?
2. How many intermodal containers per year do you expect to move via rail over the next 4 years? Will this be more or less than you would expect to move if the trial does not go ahead?
3. How many containers per year have you moved via road only over the last 5 years?
4. How many intermodal containers per year do you expect to move via rail over the next 4 years that would have otherwise been shipped via road only? Will this be more or less than you would expect to move if the trial does not go ahead?
5. How many miles is the route that the 48t HGV will travel from warehouse to rail depot at each end?
6. If you move(d) goods via road only, how many miles is each typical journey from origin to destination?
7. How many miles is travelled via rail for each typical journey from origin to destination?
8. How many tonnes of goods on average per journey did you transport over the last year?
9. How many tonnes of goods per journey do you expect to transport during the trial?
10. Is the time taken to review the trial conditions reflective of the expected time taken to carry out these tasks? If not, what would be a reasonable estimate for the number of days?
11. Is the time taken to review the trial conditions reflective of the expected time taken to carry out these tasks? If not, what would be a reasonable estimate for the number of days?
12. What employees do you expect to be involved with the review of the trial conditions? How many hours would you expect each individual in your organisation to take to review? e.g. how many hours for each employee (e.g. director, transport manager, admin staff). What is the average wage for each of these types of employees?
13. Do you anticipate there being any costs associated with upgrading or replacing your existing fleet or trailers to be able to carry the additional weight? If so, how much will it cost per trailer and how many trailers would this impact?
14. Do you anticipate that you would have to provide training to employees? If so, what would you expect the cost of this to be per employee?
15. If yes, how long would you expect the training length to be?
16. If yes, who will deliver this training? Will it be in house, or will you source an external company?
17. If yes, do you expect to deliver this training on a one to one basis or a group basis? If a group, how many would you expect to deliver to at any one time?
18. How long do you anticipate it will take to scope out proposed routes for your fleet to and from a rail depot?
19. During the trial, do you expect that there would be additional time associated with carrying out the route risk assessments / re-routing than already considered for standard trailers? If so, how much longer would you expect this to take?
20. 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?
21. Is 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?
22. Are the costs provided by the Transport Engineer report representative of the standard trailer annual running costs? These are presented in the table beneath the call out box.
23. Are the annual running costs the same for vehicles carrying 48 tonnes as the current standard trailers? If not, by what percentage are these different?
24. Are there any costs involved with adapting trailers to carry 48 tonnes, or buying suitable new trailers?

25. Do you anticipate increased tyre costs associated with operating 48t vehicles due to the increased weight? If so, how much more expensive would you expect this to be per trailer each year?
26. Have you experienced increased/decreased repair and maintenance costs while carrying additional weight? If so, how much was this increase?
27. Do you expect increased/decreased fuel costs while carrying additional weight? If so, how much do you think this would be?
28. Would the introduction of this policy result in a reduction in your fleet size and thus a reduction in VED and RUL? If so, how much would the fleet reduce by and thus how much would VED and RUL be reduced by?
29. How many 48 tonne load bearing vehicles do operators with less than 10 employees intend to use in the trial?
30. How many 48 tonne load bearing vehicles do operators with less than 50 employees intend to use in the trial?
31. Are either of these operators (with less than 50 employees) subject to higher costs than those which have been assessed in this consultation document?