

Title: Restricting the use of tyres on the front axles of heavy vehicles IA No: DFT00417 RPC Reference No: RPC-DFT-4386(2) Lead department or agency: Department for Transport Other departments or agencies:	Impact Assessment (IA)
	Date: 11 March 2020
	Stage: Final
	Source of intervention: Domestic
	Type of measure: Secondary legislation
	Contact for enquiries: IVS.Consult@dft.gov.uk
Summary: Intervention and Options	RPC Opinion: RPC Opinion Status

Cost of Preferred (or more likely) Option (in 2016 prices)			
Total Net Present Social Value	Business Net Present Value	Net cost to business per year	Business Impact Target Status
-£1.8m	-£1.2m	£0.14m	Non-qualifying provision

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

Following two collisions, resulting in eight fatalities, in the last 10 years where Coroners concluded that old tyres fitted to the front axles of heavy vehicles were a contributory factor, there are safety concerns arising from the use of old tyres on the front axles of heavy vehicles.

Heavy goods vehicle (HGV), bus, coach and minibuses owners/operators understand the private costs involved in replacing tyres, but may not be aware of the dangers associated with older tyre use, or the increased social benefits (through road safety) which may materialise from replacing older tyres fitted to front axles on HGVs, buses and coaches and on all axles in single configuration on minibuses.

Data suggests a minority of these heavy vehicle owners/operators continue to use tyres aged 10 years or older on front axles even in the presence of Driver Vehicle and Standards Agency (DVSA) published roadworthiness guidance and industry information that advises against their use. Government intervention is the best way to address this information gap and negative externality.

What are the policy objectives and the intended effects?

The policy looks to ensure that tyres aged 10 years or older are not fitted to the front axle of every HGV, bus and coach on the road, nor on all axles, in single configuration on minibuses, by expanding on the existing Construction and Use regulations to set a maximum tyre age.

The intended effect of this policy is to improve road safety by reducing the possibility that collisions involving HGVs, buses and coaches occur due to the failure of old tyres on front axles, or for minibuses due to the failure of old tyres in single configuration on all axles.

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

- **Option 0:** Do nothing
- **Option 1 (preferred at consultation):** To ban the use of tyres which are (a) aged 10 years or older, and re-treaded tyres of any age, on the steering axles (axles that control the direction of a vehicle) for all HGVs, buses, coaches and minibuses and (b) 10 years or older, or have a date of re-treading of 10 years or older, on all other axles (including trailers). This was our preferred option in the consultation but has been discounted following analysis of responses.
- **Option 2 (preferred option):** A ban on tyres aged 10 years or older on the **front steered axles** of HGVs, buses and coaches, and for all tyres in **single configuration** on minibuses. This ban will apply equally to first life and re-treaded tyres. For re-treaded tyres, their age will be calculated from the date of re-treading. We have recognised the lack of evidence for (a) extending a ban to axles other than the front axle of in-scope vehicles and (b) treating re-treaded tyres differently to new tyres. This option provides additional safeguards for minibus drivers, passengers and other road users.

Will the policy be reviewed? Yes. If applicable, set review date: Five years after legislation comes into force (late 2025)

Does implementation go beyond minimum EU requirements?		N/A		
Is this measure likely to impact on 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	

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: To amend The Road Vehicles (Construction and Use) Regulations to (a) **ban** the use of tyres aged 10 years or older, and re-treaded tyres of any age, on the **steering axles** for all HGVs, buses, coaches and minibuses and (b) **ban** the use of tyres aged 10 years or older, or having a re-treading date 10 years or older, on all other axles (including heavy trailers over 3.5 tonnes).

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2019	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low:-92.5	High: -7.1	Best Estimate: - 49.8

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
	Low	2.5		
High	85.0		0.9	92.5
Best Estimate	43.8		0.7	49.8

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

The cost of replacing tyres aged 10 years or older is estimated to affect around 0.16% of HGVs, buses, coaches, and minibuses. These vehicles are primarily owned by businesses with some private and third-party organisation ownership. The costs are those of disposing of tyres, which are in use, and bringing forward the purchase of new tyres. Replacing all re-treaded tyres on steering axles would mean replacing around 14% of tyres on steering axles and would have a significant cost impact. The variation in cost comes from differing assumptions on the redistribution of re-treaded tyres onto other axles. Costs also include estimates for familiarisation cost, enforcement cost and cost of disposal of used tyres.

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

Demand for re-treaded tyres and tyres which are 10 years or older will fall and businesses or individuals selling those will sell fewer units. Lost revenue may be made up through passing cost onto consumers, and other businesses may benefit through the sale of newer tyres.

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

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

None

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

The benefit of fatalities avoided could be monetised. But uncertainty is very high regarding the baseline and the number of fatalities likely to occur in the counterfactual. Avoiding 23 fatalities in the next ten years would make this policy cost neutral. This measure is also likely to reduce more minor collisions, which may have safety benefits.

Key assumptions/sensitivities/risks

Discount rate (%)

3.5%

The main sensitivity is around how re-treaded tyres would be redistributed away from the front axle and on to other axles. This is what causes the large variation in costs.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m: Costs: 5.0 Benefits: 0.0 Net: -5.0	Score for Business Impact Target (qualifying provisions only) £m: n/a
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Summary: Analysis & Evidence

Policy Option 2

Description: To amend The Road Vehicles (Construction and Use) Regulations to **ban tyres aged 10 years or older on the front steered axles of HGVs, buses and coaches, and for all tyres in single configuration on minibuses.** This ban will apply equally to first life and re-treaded tyres, for re-treaded tyres, their age will be calculated from the date of re-treading. **(Preferred Option)**

FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2019	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: -2.3	High: -1.6	Best Estimate: -2.0

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0.6	0.12	1.6
High	0.9	0.17	2.3
Best Estimate	0.7	0.16	2.0

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

The cost of replacing tyres aged 10 years or older is estimated to affect around 0.16% of the HGVs, buses, coaches, and minibuses considered in this option. These vehicles are primarily owned by businesses with some private and third-party organisation ownership. The costs are those of disposing of tyres, which are in use, and bringing forward the purchase of new tyres. The costs under this option will be lower than Option 1, due to fewer tyres being within scope. Cost estimates also include familiarisation and enforcement costs.

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

Businesses and individuals selling tyres which are 10 years or older may sell fewer units, these costs are estimated to be low since we are not aware of a market for the sale of these older tyres for in-scope vehicles. Any lost revenue may be made up through passing cost onto consumers, through the prices of newer tyres

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	0.0	0
High	0	0.0	0
Best Estimate	0	0.0	0

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

None

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

The benefit of fatalities avoided could be monetised. But uncertainty is very high regarding the baseline and the number of fatalities likely to occur in the counterfactual. Avoiding 0.9 fatalities in the next ten years would make this policy cost neutral.

This measure is also likely to reduce more minor collisions, which will have safety benefits. These are likely to be lower than those under Option 1, as the scope of older tyres to be replaced is lower.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5%
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BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m: Costs: 0.2 Benefits: 0.0 Net: -0.2	Score for Business Impact Target (qualifying provisions only) £m: n/a
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1. Policy Rationale

Problem under consideration

1. In September 2012, a catastrophic failure of a 19 year old tyre, fitted to the steering axle of a large coach, led to the loss of three lives. The Coroner concluded that the tyre failure was a result of its age.
2. In September 2017, a Heavy Goods Vehicle (HGV) travelling on the M5 suffered a tyre blow-out on the steering axle resulting in the loss of five lives. The Coroner concluded that this crash was due to a tyre blow-out and noted that an 18 year old tyre fitted to the steering axle had suffered structural deterioration due to its age.
3. The Driver and Vehicle Standard Agency (DVSA) publish a guide to maintaining roadworthiness for commercial goods and passenger carrying vehicles. This was updated in 2013 to advise bus operators against fitting tyres older than 10 years to the steering axles of their vehicles. In November 2018¹ this guidance was extended to cover HGVs, advising that tyres aged more than 10 years old should not be used on HGVs except on a rear axle as part of a twin wheel arrangement.
4. DfT commissioned research in 2018 with the aim to establish the effect age has on the integrity of road vehicle tyres. As part of this research, the UK's TRL Ltd worked with a leading laboratory in the United States to carry out testing and analysis². Although the research is not statistically conclusive, it suggests that corrosion is more likely to be found in older tyres and highlights the ability of moisture to penetrate through cuts in the tread area into the structure of the tyre. The research also implies change in the hardness of the rubber, both in the tread area and the sidewall for older tyres. This hardness can reduce the flexibility of the tread and increase stresses on the bonds that form the tyres structural integrity.
5. Collectively, this research, expert witnesses and the conclusions from the Coroners' inquests provided us with evidence that age does affect tyre performance. DVSA data³ on roadside checks shows that there are a small number (0.16%) of HGVs, buses, coaches and minibuses that use tyres over 10 years old, despite the introduction of DVSA's roadworthiness guidance.
6. In order to remove this threat to road safety we are introducing a legislative proposal, on a precautionary basis to ban tyres 10 years or older on steering axles on heavy vehicles (and on all axles in a single configuration⁴ on minibuses). Different policy options were included in a statutory consultation, published in June 2019⁵. Buses, coaches, heavy goods vehicles and minibuses are included within this analysis.

Rationale for intervention

7. This section introduces the market failures associated with older tyre use. Reasons why the market fails to deliver a higher level of safety in the absence of government intervention are discussed, as well as why the proposed intervention is justified.

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785463/guide-to-maintaining-roadworthiness-commercial-goods-and-passenger-carrying-vehicles.pdf [last accessed 13/02/20]

² <https://www.gov.uk/government/publications/tyre-ageing-its-effect-on-material-properties-and-structural-integrity> [last accessed 13/02/20]

³ DVSA provided unpublished 2018 data on annual and roadside inspections (first test and retests) of HGVs, buses, coaches and minibuses. Out of the nearly 2,700 HGVs, 81,000 buses and coaches, and 3,200 minibuses inspections, only a small minority had at least one tyre aged 10 years or above on the front steering axle (0.15%, 0.06% and 0.28% vehicles respectively). It is assumed that these samples are representative of all HGVs, buses, coaches and minibuses.

⁴ This is when one tyre is fitted to one axle, in comparison to two tyres fitted adjacent to one another on one axle, which is described as tyres fitted in twin configuration.

⁵ <https://www.gov.uk/government/consultations/banning-tyres-aged-10-years-and-older> [last accessed 13/02/20]

8. **There is asymmetric information influencing heavy vehicle owners/operators' tyre replacement decisions.** Some HGV, bus, coach or minibus owners/operators may not believe that their older tyres present additional danger (in terms of road safety) compared to a newer tyre. The potential for this information gap is largest for vehicles which do not operate commercially and are not subject to Operator licensing⁶. These operators are not required to follow DVSA maintenance schedules and may not be familiar with roadworthiness guidance.
9. **Moral hazard is a form of asymmetric information leading to market failure.** Vehicle owner/operators are insured for third party damages by law. They may also be covered for damage to their own vehicles, including the impact of lost working time a collision would have on their fleet. This means once owner/operators have paid their annual insurance premiums, any damage occurring to other road users and the roads themselves will not result in any additional costs (beyond a negligible insurance excess). Because there is currently no legal requirement for tyre age, insurers do not expect owners/operators to record tyre age, so they cannot charge different amounts dependent on the risk profile arising from the age of tyres used. As such, vehicle owners/operators bear none of the costs of a collision (due to compulsory insurance) and no additional insurance costs if they used old tyres, but all of the costs of tyre replacement. Without intervention, there will be more old tyres in use than the socially optimum amount.
10. **There is a negative externality associated with using old tyres on heavy vehicles.** A vehicle owner/operator will only consider the private cost of replacing an older tyre. They will not take into account the wider social cost⁷ associated with the increased risk of road collisions from using the old tyre. Therefore in a free market environment, these tyres will be replaced less frequently than the socially optimal level.
11. **A ban on the use of older tyres on the front axle of heavy vehicles (and on all axles for minibuses) is the preferred option to address these failures.** Safety issues arising from the use of older tyres on front axles point to the need to remove them from being fitted to heavy vehicles. Due to the asymmetric information and negative externality concerns mentioned above, these tyres will be replaced less frequently than the socially optimal level. Publicly available information has not brought replacement rates to this optimal level (considered in detail in the considered options). As such, government intervention calling for a ban on these tyres will best address these failures. Consideration of other methods (such as for instance a tax on older tyres) may not deliver the same outcomes. Such methods are costly to implement and enforce and present a route for potentially dangerous tyres to remain on the market. Given the relatively small number of older tyres on the market, it is more proportionate to ban older tyres on a precautionary basis.

Use of the Precautionary Principle

12. We believe it is appropriate to propose a ban on tyres aged 10 years and older on front axles of HGVs, buses and coaches and on all axles of minibuses based on the precautionary principle. We have reviewed the Regulatory Policy Committee's guidance note⁸ in making our decision and our rationale is

⁶ An Operator licence is required if a business uses vehicles to carry goods or people for hire and reward (HGVs over 3.5 tonnes or vehicles that can carry 9 or more passengers). The terms of the licence require the operator to follow a maintenance and safety inspection regime. Traffic commissioners are responsible for licensing and regulating operators of heavy goods vehicles (HGVs), public service vehicles (PSVs) and local bus services <https://www.gov.uk/traffic-commissioner>

⁷ More collisions would result in: increased road infrastructure repair bills (and associated time costs for road users whilst those repairs take place), more emergency service workers, increased property damage from those involved in collisions, decreased fleet capacity for businesses through more repairs needed, more physical and mental health complaints from individuals involved in collisions (also resulting in an increase in healthcare spending), more unproductive time for those who are injured and more legal and other administrative costs from road traffic collisions.

⁸ <https://www.gov.uk/government/publications/rpc-guidance-using-the-precautionary-principle-january-2020> [last accessed 13/02/20]

set out below. This is based on guidance from the United Kingdom Interdepartmental Liaison Group on Risk Assessment (UK-ILGRA)⁹, chaired by the Health and Safety Executive's Chief Scientist.

Stage 1 – Evidence for Harmful Effects

13. **Tyres aged over 10 years are still being used on some vehicles.** We have evidence from DVSA data¹⁰ that since the 2013 guidance was issued, there are still some buses and coaches operating with tyres aged over 10 years so, the current guidance is not completely effective. We believe it is reasonable to assume that this would also be the case for HGVs brought into scope by the 2018 guidance update and that in the absence of regulation, we may not see all operators removing tyres aged 10 years or older from their vehicles. There is also a proportion, estimated by DVSA¹¹ to be 25% of HGVs and 30% of buses, coaches and minibuses that are operated privately and are not subject to Operator licensing and its associated maintenance schedules. The vehicle involved in the second fatal collision was a privately-owned vehicle falling within this subset.
14. **Older tyres may be causing more collisions, injuries and deaths than we are aware of.** We are only aware of two incidents where Coroners concluded that tyre failure due to age was a contributory factor. However, it is possible that there have been more incidents leading to property damage, injury and death where tyre age was not considered, since there is no current legal requirement for tyre age. There is an incomplete evidence base to inform the impact that older tyres have on road safety, since tyre age is not routinely recorded in collision investigation data.
15. **Reason to believe there are negative safety implications in the use of older tyres.** While there is still some uncertainty, collectively, the Department's research, the evidence from the tyres examined from the 2017 HGV crash and the expert opinion provided to the Coroners for both the incidents all suggest that older tyres have negative road safety implications.

Stages 2 and 3 – Irreversible Harmful Effects and Level of Scientific Uncertainty

16. Given our assessment above and the severity of the two fatal collisions where a defective tyre fitted to the steered axle of the vehicle was cited as contributing factor, we consider it is reasonable to assume that, in the absence of legislation, tyres aged 10 years or older fitted to the front axles of in scope vehicles have the potential to cause further fatalities.
17. The severity of the structural failure of the tyres in the two fatal collisions and the effect of these failures on the directional control of the vehicles is clear, however these examples alone cannot provide scientifically robust evidence. The Department's research, together with information from expert witnesses, provides evidence of significant changes to material properties within the structure of a tyre that would be associated with mechanism of failure seen in the two fatal collisions. This evidence is limited and insufficient to support a robust assessment of the risks and likelihood of harm as tyres age, so a precautionary approach is appropriate.

Stage 4 – Review

18. DVSA will continue to record tyre age data of in scope vehicles as part of the annual testing regime. We will review this dataset annually to monitor compliance with this legislation and to improve our evidence base in this area. We have given details of a five year post-implementation review for this policy since this timeframe will permit a valid, statistically significant dataset to be generated.

⁹ <https://webarchive.nationalarchives.gov.uk/20190701152341/https://www.hse.gov.uk/aboutus/meetings/committees/ilgra/pppa.htm> [last accessed 13/02/20]

¹⁰ DVSA provided unpublished 2018 data on annual and roadside inspections (first test and retests) of HGVs, buses, coaches and minibuses. Out of the nearly 2,700 HGVs, 81,000 buses and coaches, and 3,200 minibuses inspections, only a small minority had at least one tyre aged 10 years or above on the front steering axle (0.15%, 0.06% and 0.28% vehicles respectively).

¹¹ Unpublished DVSA data, 75% of HGVs and 70% of buses, coaches and minibuses are operated commercially under Operator licences

19. By creating a legal requirement, we expect tyre age to be collected in road traffic collisions, which may also build our evidence base for this policy.

Policy objective

20. The policy objective is to reduce the number of road traffic collisions resulting from old tyres.

21. Fewer collisions would result in:

- a. Reduced road infrastructure repair bills (and associated time costs for road users whilst those repairs take place),
- b. Fewer physical and mental health complaints from individuals involved in collisions (also resulting in a healthcare spending reduction);
- c. Less unproductive time for those who are injured in collisions;
- d. Reduced property damage from those involved in collisions;
- e. Increased fleet capacity for businesses through fewer repairs needed;
- f. Fewer emergency service workers;
- g. Fewer legal and other administrative costs.

Options considered (including do minimum)

Baseline (Do Nothing)

22. **Option 0 (Do minimum):** This is the counterfactual scenario, where regulations focussing on the use of older tyres are not introduced. It has not been possible to predict the number of collisions that will occur without intervention due to the infrequency of collisions. Instead, for indicative purposes, each policy option considers the 'tipping point', or the number of collisions that would have to be prevented for the policy to be cost neutral.

Legislative Options

23. **Option 1 (Preferred option at consultation):** To **ban the use of tyres aged 10 years or older** on all axles HGVs, heavy trailers, buses, coaches and minibuses, including tyres that have been re-treaded 10 or more years ago. Additionally, we proposed to **prohibit the use of re-treaded tyres of any age on the steered axles** of these vehicle types, in line with the UK tyre industry best practice. This was our preferred option in the consultation but has been discounted following analysis of responses. In our decision not to proceed with this option we recognised the lack of evidence for (a) extending a ban to axles other than the front axle of in scope vehicles and (b) treating re-treaded tyres differently to new tyres. Consultation responses centred around the disproportionate effect this option will have on the re-treaded tyre industry and associated employment and environmental impacts.
24. **Option 2 (Preferred):** To amend The Road Vehicles (Construction and Use) Regulations to **ban** the use of tyres aged 10 years or older on **steering axles** for all HGVs, buses and coaches and on **all axles for minibuses** (where the tyre is fitted in single configuration) only. The view of DfT engineers is that the risk of loss of control of the vehicle, as a result of a failure of a rear tyre in single configuration is higher than when used in twin configuration so it is appropriate to include all tyres in single configuration on minibuses in any legislation, to maximise the road safety benefits. This option provides additional safeguards for minibus drivers, passengers and other road users, without a significant increase in costs, given the relatively low cost of replacing any non-compliant tyres on minibuses. This is our **preferred option** since it is logical to capture the diverse groups that use minibuses, 90% of which are currently not used under an Operator licence and therefore not subject to DVSA maintenance schedules or roadworthiness guidance This ban will apply equally to first life and re-treaded tyres, for re-treaded tyres, their age will be calculated from the date of re-treading. By treating re-treaded tyres equally to first life tyres we will mitigate risk to the UK re-treading industry. This option also allows operators to

source high quality tyres at lower costs than first life tyres, mitigates environmental impact and contributes to Defra's recycling and waste strategy.

Alternatives to regulation considered

25. **Industry and government guidance is not working to the level desired.** Due to the above market failures, we expect older tyres on heavy vehicles to remain fitted at levels higher than that which is socially optimal.
26. Some tyre manufacturers¹² advise users to replace tyres once the 10 year limit is reached. Following the collision in 2012, DVSA roadworthiness guidance was introduced in 2013, which advised bus and coach operators against the use of tyres older than 10 years on front axles. This was updated in 2018 to apply the same rules to HGVs. The Tyre Industry Federation, in association with the Freight Transport Association (FTA) and the Road Haulage Association (RHA) published a Guide to Tyre Management¹³ in 2015 that covered tyres fitted to heavy vehicles in the UK (trucks, trailers, buses and coaches), re-iterating this advice. It was hoped that in the aftermath of the collision, none of these vehicles would be fitted with older tyres on front axles.
27. **Analysis of DVSA annual and roadside testing** (which is explored further in the cost section of this impact assessment) **show that a small proportion of these vehicles** (estimated to be around 0.16%) **are still fitted with tyres aged 10 years and above on the front axle** (6 years after the introduction of the 2013 guidance). Due to a lack of evidence, it has not been possible to analyse how older tyre fitment rates on front axles have changed due to the update of the guidance in 2013. The current data does not allow us to analyse how successful for the 2018 guidance update for HGVs has been.
28. **Given the advisory nature of the published guidance and information, these are not enforceable.** DVSA estimate¹⁴ that approximately 75% of HGVs and 70% of buses, coaches and minibuses are operated commercially under Operator licences and follow the maintenance schedules, reflecting DVSA roadworthiness guidance, that licensing requires. This leaves 25-30% of in-scope vehicles that are not obliged to follow DVSA maintenance regimes and may not be aware of the roadworthiness guidance (DVSA estimate¹⁵ this is up to 90% of all minibuses). For example, the vehicle involved in the second fatal collision (2017) was privately owned and not subject to Operator licensing.
29. **We consider that further intervention is necessary, on a precautionary basis, since there is still a minority of vehicles fitted with tyres aged 10 years or older on front axles.** The DfT and its Agencies are working closely to ensure vehicle operators understand how to maintain the safety and roadworthiness of their vehicles, including their tyres, and to enforce any non-compliance.

Policy specifics and exemptions

30. **A 10-year age limit is appropriate.** In advance of the 2013 update of DVSA's roadworthiness guidance and given the lack of available scientific evidence to define an optimal age limit, the figure of 10 years was chosen on a precautionary basis by the Secretary of State for Transport, in collaboration with industry stakeholders. At least two major tyre manufacturers also recommend replacing tyres aged 10 years or older¹⁶.

¹² <https://www.michelin.co.uk/auto/tips-and-advice/advice-auto/when-to-replace-tyres> [last accessed 13/02/20],

<https://www.blackcircles.com/helpcentre/tyres/age-of-a-tyre> [last accessed 13/02/20],

https://www.mytyres.co.uk/FAQs/Questions_about_our_products_Tyres_Questions_about_tyre_age.html#2963 [last accessed 13/02/20]

¹³ <http://itma-europe.com/wp-content/uploads/CV-Tyre-Management.pdf> [last accessed 13/02/20]

¹⁴ Unpublished DVSA data

¹⁵ Unpublished DVSA data

¹⁶ <https://www.michelin.co.uk/auto/tips-and-advice/advice-auto/when-to-replace-tyres> ; <https://www.continental-tires.com/car/tire-knowledge/tire-damage-age-repair/replacing-tires> [last accessed 13/02/20]

31. The Department was not able to examine the 19 year old tyre involved in the 2012 coach crash, however the 18 year old tyres involved in the 2017 incident were examined and found to have substantial corrosion in the steel cords. This informed the decision to update DVSA roadworthiness guidance in November 2018 to extend the Department's advice against the use of tyres aged more than 10 years old on front axles, to include trucks. The DfT commissioned research project¹⁷ saw material changes in tyre structure began to appear around 8-9 years, although due to limited sample sizes this was not statistically conclusive. Since 2013, industry has continued to support the 10 year age limit and no evidence to support a different limit was received at consultation.
32. Therefore, on balance, given the lack of scientific evidence to determine a specific age limit, the Department has elected to set the limit at 10 years, in keeping with current DVSA roadworthiness guidance, industry advice and its memorability.
33. **We are offering exemptions to certain vehicles**, following the assessment of views from the consultation. These will include agricultural tractors and vehicles of historic interest, providing that they are not operating commercially.

Consultation and other discounted policy options

34. In 2019, The Government consulted¹⁸ on options to ban older tyres on heavy vehicles, including legislation to make it illegal for buses, coaches, heavy goods vehicles, and minibuses to have tyres aged 10 years and older. The consultation closed on 1st September 2019 and received over 1,100 responses.
35. We have considered carefully how to account for re-treaded tyres in any ban. Re-treaded tyres are a key element of the heavy-duty vehicle tyre market (around 30%¹⁹), providing a cost-effective product to operators, an environmentally sustainable solution to recycling worn tyres and employment at UK manufacturing sites. There are different re-treading processes but these in effect replace the tread on worn tyres by removing some of the existing tyre rubber compound, inspecting the tyre carcass and then adding a new layer of rubber and tread. All re-treaded tyres supplied in the UK must comply with specific, international United Nations Economic Commission for Europe (UNECE) Regulations and be tested according to the same load and speed criteria as those used for new tyres. During the re-treading process a new date is imprinted on the tyre, denoting the date of re-treading but there is no requirement in current regulations to retain or record the original date of manufacture of the tyre carcass.
36. **We discounted the proposal to bans the use of tyres which are 10 years or older, and re-treaded tyres of all ages on all axles** of HGVs, heavy trailers, buses, coaches and minibuses. In this option prohibiting the use of re-treaded tyres of any age is the only way to guarantee, under current regulations, that every element of a re-treaded tyre was below 10 years old. This is not the desired outcome of our policy as all re-treaded tyres supplied in the UK must comply with UNECE Regulations, testing them to the same load and speed criteria as new tyres, regardless of age. We discounted this option in advance of consultation. The costs of this option were estimated at £479m, as detailed in Option 1 in the consultation stage IA²⁰.
37. As our consultation proposal, but to **allow tyres 10 years and older on heavy trailers**. This option (option 3 in the consultation stage IA²¹) would permit older tyres on trailers but not on any other locations and would also ban re-treaded tyres of any age from the front axles. We have discounted this option following analysis of consultation responses, using the same rationale as for discounting Option

¹⁷ <https://www.gov.uk/government/publications/tyre-ageing-its-effect-on-material-properties-and-structural-integrity> [last accessed 13/02/20]

¹⁸ <https://www.gov.uk/government/consultations/banning-tyres-aged-10-years-and-older> [last accessed 13/02/20]

¹⁹ <https://btmauk.com/wp-content/uploads/2018/03/Retread-brochure-jan18.pdf> [last accessed 13/02/20]

²⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/811054/banning-old-tyres-impact-assessment.pdf [last accessed 13/02/20]

²¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/811054/banning-old-tyres-impact-assessment.pdf [last accessed 13/02/20]

1 above, recognising the lack of evidence for (a) extending a ban to axles other than the front axle of in scope vehicles and (b) treating re-treaded tyres differently to new tyres.

38. To **ban the use of tyres which are 10 years or older from front axles only** of all in-scope vehicles, with re-treaded tyres treated equally to new (first life) tyres. We have discounted this option following analysis of consultation responses to provide additional safeguards for minibuses drivers as per our discussion of our preferred Option 2 above.

Enforcement

39. We are working with DfT legal colleagues to develop this approach and plan to use the same provisions for non-compliance to those in place for contravention of the legal minimum tread depth requirement. In these cases, the driver and/or the vehicle owner/operator can be fined, or subject to Magistrate Court proceedings. For Court prosecution the sanctions available are fines, driving licence penalty points or, in severe cases, disqualification from driving. The maximum fine is Level 5 for offences for goods vehicle, minibuses or buses. This means in England and Wales the fines are unlimited whereas in Scotland and Northern Ireland the fine is a maximum £5000.

2. Costs and Benefits

40. This section outlines the transition and annual costs which build the total cost of each option. The costs borne in replacing non-compliant tyres in the initial year, as well as a familiarisation cost to operators, are treated as transitional costs, as they are one-off. The recurring costs to replace tyres which turn 10 years of age annually are treated as annual costs. The costs in this section result from central estimate tyre costs being applied. The low and high tyre cost estimates are as per the published consultation stage impact assessment²², which when applied result in the high and low transitional, annual average and total cost estimates presented in the summary sheets of this impact assessment.

Option 0: Baseline

41. There are no direct costs associated with Option 0, as there are no changes to currently set requirements regarding tyre use. Option 0 is the baseline against which all other options are compared.

Appropriateness of baseline

Will factors (exogenous to the policy) that influence road safety be implemented?

42. In the baseline scenario, it is assumed that no further policy interventions are implemented. I.e. we currently do not expect any other policy interventions relevant to the safety of old age tyres over the 10 year appraisal period. We have used a standard 10 year appraisal period in line with Green Book²³ guidance.

How many collisions and injuries may occur in the absence of regulation?

43. The Coroner's inquest to the collisions in 2012 and 2017, concluded that it was tyre age that caused the tyres at fault to fail. In addition, results from DfT commissioned research into the effects of ageing on tyre integrity (and therefore safety), concluded that tyres start to degrade when older, making them subject to corrosion and cracking, which compromises safety. These two points together suggest that the use of older tyres have negative road safety implications, which can result in collisions.

²² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/811054/banning-old-tyres-impact-assessment.pdf [last accessed 13/03/20]

²³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf [last accessed 13/03/20]

44. Given that older tyres compromise road safety and alternatives to regulation to remove such tyres has not been completely successful, it is possible further collisions due to the age of tyres could occur in future.
45. The two collisions mentioned are the only two the Department is aware of which are specifically concluded to be due to older tyre age. As such, there is no further empirical evidence available to help suggest a baseline trend in collisions due to old tyre age. In the baseline, the introduction of guidance may have reduced the risk of further collisions, but it is clear from DVSA checks that older tyres are still in use presenting an ongoing risk.
46. It requires significant investigative work and resources to identify where tyre age is the factor that caused a collision. In two specific cases, it was possible for the Coroner to identify that it was the tyre age that caused the collision. However, in many other cases it would not be possible to identify this, if the collision was such that the tyre was too damaged to analyse, or if the tyre experienced other damage that meant that the Coroner could not conclude definitively that the tyre age was the cause of the incident. It is possible that older tyres were involved in other collisions that led to injuries or death, but that these have not been identified during the collision investigation or by the Coroner's court.
47. Additionally, there may be many other collisions resulting in property damage or injury, imposing a cost we cannot capture as tyre age is not routinely collected in collision reports.
48. At consultation, views were received that challenged our use of our counterfactual (where 8 fatalities were assumed to occur as a result of older tyres over the next 10 years), given the existence of the DVSA roadworthiness guidance and the high compliance observed by DVSA enforcement teams. This guidance was introduced in 2013 following the first collision in 2012. Additionally, no evidence is available from previous decades, meaning determining specific probabilities is not possible.
49. As an alternative approach, we now present tipping point analysis to consider how many lives the regulation would have to save to be cost neutral.

Costs Policy Option 1

50. The costs of policy Option 1 consist of the following direct costs to operators:
 - a. Cost of replacing tyres aged 10 years or older on all axles
 - b. Cost of replacing re-treads on steering axles
 - c. Cost of disposal of discarded tyres
 - d. Familiarisation cost
 - e. Enforcement cost (cost falls on operator and DVSA)

Prevalence of tyres aged 10 years or older on all axles

51. A breakdown of the number of tyres assumed by axle configuration is included in Table 1. It is assumed that the steering axles on the tractor units are fitted with single tyres, whilst the other axles are fitted with twin tyres. This only applies to 2 and 3 axle tractor units. 4 axle vehicles are assumed to have two steering axles (fitted with single tyres) and two rear axles (fitted with twin tyres). All trailer units are assumed to be fitted with single tyres. The number of axles on trailers for rigid HGVs have not been given, so it has been assumed these are equal to the tractor unit. As a simplifying assumption, trailers with 4 or more axles are assumed to have 4 axles.

Table 1: Number of tyres by axle configuration

Axle configuration	Number of tyres excluding trailers	Number of tyres including trailers
Rigid Vehicles		
2 Axle & 2 axle trailer	6	10
3 Axle & 3 axle trailer	10	16
4 Axle & 4 or more axle trailer	12	20
Articulated Vehicles		

2 Axle Tractor Unit & 2 axle trailer	6	10
2 Axle Tractor Unit & 3 axle trailer	6	12
2 Axle Tractor Unit & 4 or more axle trailer	6	14
3 Axle Tractor Unit & 2 axle trailer	10	14
3 Axle Tractor Unit & 3 axle trailer	10	16
3 Axle Tractor Unit & 4 or more axle trailer	10	18

52. In order to estimate the average number of tyres for this option, the number of tyres presented above has been weighted by the corresponding number of vehicles in the fleet (sourced from DfT vehicle licensing statistics, table VEH0524). This is shown in Table 2.

Table 2: Weighted average number of tyres (incl. trailers)

Axle configuration	Weighting	Number of tyres
Rigid: 2 Axle	47%	10
Rigid: 3 Axle	12%	16
Rigid: 4 Axle	9%	20
Articulated: 2 Axle Tractor Unit & 2 axle trailer	2%	10
Articulated: 2 Axle Tractor Unit & 3 axle trailer	3%	12
Articulated: 2 Axle Tractor Unit & 4 or more axle trailer	1%	14
Articulated: 3 Axle Tractor Unit & 2 axle trailer	0%	14
Articulated: 3 Axle Tractor Unit & 3 axle trailer	26%	16
Articulated: 3 Axle Tractor Unit & 4 or more axle trailer	0%	18

Weighted average number of tyres (incl. trailers)	13
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53. From the above, it has been estimated that the weighted average number of tyres on a HGV including trailers is **13**²⁴. It is assumed that buses, coaches and minibuses do not tow trailers. It is assumed that buses and coaches are 2 axle units, with the steering axle being fitted with single tyres, and the other axle being fitted with twin tyres, resulting in **6** tyres per vehicle. It is assumed that minibuses are 2 axle units fitted with single tyres, resulting in **4** tyres per vehicle.

54. Table 3 suggests that 44 buses and coaches (assumed to scrap and replace 6 tyres), 254 minibuses (assumed to replace 4 tyres) and 781 HGVs (assumed to scrap 13 tyres) are initially affected. This implies 11,656 tyres would need to be scrapped and replaced.

Table 3: Expected number of HGVs, buses, coaches and minibuses with tyres aged 10 years or older in initial year

	Total number of licensed vehicles (2018) ²⁵	Expected number with tyre(s) aged 10 years or older
Buses and coaches	73,832	44
Minibuses	89,080	254
HGVs	526,744	781
Total	689,656	1,078

Prevalence of re-treaded tyres on steering axles

²⁴ The weighted average number is around 13.3 tyres

²⁵ Source DfT statistics: <https://www.gov.uk/government/organisations/department-for-transport/about/statistics> [last accessed 13/02/20]

55. Based on BTMA figures²⁶ we can assume that re-treaded tyres make up around 30% of all tyres in use. And based on a survey by Aecom Arup²⁷, we estimate that 14% of tyres on steering axles are re-treaded tyres and would need to be replaced.

Table 4: Number of re-treaded tyres on steering axles likely to be replaced

	Total number of re-tread tyres	Likely to be replaced
Buses and coaches	131,680	18,570
Minibuses	105,917	14,937
HGVs	2,081,127	293,492
Total	2,318,724	326,999

Cost of disposal

56. We received no information on disposal cost from the consultation. Tyres cannot go to landfill but have to be processed and recycled. Discussion with an industry expert provided us with an estimated processing and recycling cost of £10-£20 per tyre. We use £10 for the low cost, £15 for the central and £20 for the high cost scenario. The high and low-cost estimates are based on a range of disposal costs and a range of tyre prices as included in the consultation stage impact assessment²⁸.

Table 5: Discounted cost of replacing tyres under Option 1 (£,2019 prices, nominal)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Low	1,178,159	285,205	279,585	273,032	266,633	260,130	253,785	247,595	241,556	235,665
Central	42,457,705	489,875	480,223	468,968	457,976	446,806	435,908	425,276	414,904	404,784
High	83,733,738	694,357	680,676	664,722	649,143	633,310	617,863	602,794	588,091	573,748

Familiarisation cost

57. Most vehicles in scope of this regulation are already under the Operator licence regime, which means they should be familiar with the guidance not to fit tyres aged 10 years or older to steering axles. However, the requirement to not fit re-treads to steering axles would be new and the requirement not to fit tyres aged 10 years or older to non-steering axles would also be new. Therefore, we have to assume that a familiarisation cost would be imposed on all operators. We estimate this at £1.89 per vehicle (10 minutes at the minimum wage rate of £8.72²⁹ per hour, plus 30% non-wage labour cost), with a total cost of **£1,302,990** in the first year only.

58. At consultation, the costs associated with the logistics to administer this change, including vehicle downtime and maintenance costs and the labour cost incurred for changing tyres, to ensure their compliance to this proposed change in legislation were identified as potential additional costs. Views from consultees was that these would be significant for the proposal included in the consultation, we estimate that these will be much lower if our preferred option is implemented, since only tyres on front axles (of HGVs, buses and coaches) and on all axles on minibuses will need to be checked, and since re-treaded tyres are now treated as first life tyres.

²⁶ <https://btmauk.com/wp-content/uploads/2018/03/Retread-brochure-jan18.pdf> [last accessed 13/02/20]

²⁷ Source: DfT commissioned report to be published alongside the consultation response

²⁸ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/811054/banning-old-tyres-impact-assessment.pdf [last accessed 13/02/20]

²⁹ <https://www.gov.uk/national-minimum-wage-rates> [last accessed 14/02/20]

Enforcement cost

59. Following discussions with DVSA we estimate that each MOT test will take one minute longer than it currently does once our preferred option (Option 2) is introduced, given that testing technicians are already inspecting the condition of tyres on vehicles, so checking the age of front axle tyres is not expected to add significant time to a test duration. We have assumed the cost imposed by this is one minute per owner/operator plus one minute per MOT technician involved. We estimate their wage rates of £8.72³⁰ and £9.40³¹, respectively per hour, plus 30% of non-wage employment costs. This adds a cost of £0.39 per MOT inspection for all vehicles and a total cost of £270,760 in the first year. To account for an increase in the number of vehicles in line with GDP growth, we have increased this annual cost estimate slightly over the following nine years, based on HMT's GDP deflator³², before discounting it. We did not receive any data during the consultation to inform this analysis. We recognise that there is scope for the enforcement costs for Option 1 to be an underestimate but we have not performed sensitivity analysis since this is not our preferred option.

Table 6: Discounted cost of enforcement under Option 1 (£, 2019 prices, nominal)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total	270,759	267,881	265,034	262,350	259,694	257,064	254,461	251,884	249,334	246,809

Total cost of Option 1

60. In total, the above discounted costs add up as shown in Table 7:

Table 7: Discounted total costs under Option 1 (£, 2019 prices, nominal)

	TOTAL	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Low	6,106,617	1,448,918	553,086	544,619	535,383	526,327	517,194	508,246	499,480	490,890	482,474
Central	50,370,685	44,031,454	757,757	745,257	731,318	717,670	703,870	690,369	677,160	664,237	651,593
High	93,326,702	85,307,487	962,238	945,710	927,073	908,836	890,374	872,324	854,678	837,425	820,557

Costs Policy Option 2 (preferred)

61. This option seeks to replace all tyres which are 10 years of age and above on steering axles for HGVs, buses and coaches and on all axles for minibuses. Re-treaded tyres are treated as first life tyres.

62. The costs of policy Option 2 consist of the following direct cost items to operators:

- a. Cost of replacing tyres aged 10 years or older on steering axles for buses, coaches and HGVs
- b. Cost of replacing tyres aged 10 years or older on all axles for minibuses
- c. Disposal cost
- d. Familiarisation cost
- e. Enforcement cost (cost falls on operator and DVSA)

Number of vehicles affected in initial year

63. DVSA provided data for 2018 on annual and roadside inspections (first test and retests) of HGVs, buses, coaches and minibuses. Out of the nearly 2,700 HGVs, 81,000 buses and coaches, and 3,200

³⁰ <https://www.gov.uk/national-minimum-wage-rates> [last accessed 14/02/20]

³¹ https://www.payscale.com/research/UK/Job=Automobile_Mechanic/Hourly_Rate [last accessed 14/02/20]

³² <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-december-2019-quarterly-national-accounts> [last accessed 13/02/20]

minibuses inspections, only a small minority had at least one tyre aged 10 years or above on the front steering axle (0.15%, 0.06% and 0.28% vehicles respectively). It is assumed that these samples are representative of all HGVs, buses, coaches and minibuses. A further key assumption is that all tyres on a vehicle are around the same age, and so if one is 10 years or older, the others are likely to be. We have also assumed, based on DVSA estimates³³, that 25% of HGVs and 30% of buses, coaches and minibuses are outside the Operator licensing regime.

Total discounted cost of replacing tyres under Option 2 including disposal

64. The same number of vehicles are in scope as under Option 1, however fewer tyres need to be replaced. Under this policy option, all re-treaded tyres are treated as first-life and no re-treaded tyres with a re-treading date less than 10 years ago need to be replaced, which means most of the costs of Option 1 are not incurred.
65. Tyres aged 10 years or older have to be replaced on steering axles for HGVs, buses and coaches, and tyres aged 10 years or older have to be replaced on all axles on minibuses. The high and low-cost estimates are based on a range of disposal costs and a range of tyre prices³⁴.

Table 8: Discounted cost of replacing tyres under Option 2 (£, 2019 prices, nominal)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Low	222,784	51,376	48,661	45,913	43,321	40,835	38,492	36,283	34,201	32,239
Central	378,503	87,509	82,884	78,204	73,789	69,555	65,564	61,801	58,255	54,912
High	533,357	123,460	116,935	110,333	104,103	98,129	92,499	87,191	82,188	77,472

Familiarisation cost

66. The majority of vehicles in scope of this regulation are already under the Operator licence regime and are required to follow DVSA roadworthiness guidance not to fit tyres aged 10 years or older on steering axles. The DVSA currently conducts annual and roadside checks for Operator licensed HGVs, buses, coaches and minibuses, which involves checking aspects of the tyres, including tyre age. Unlike for policy Option 1, nothing changes for these operators in Option 2 except that the guidance becomes legally binding. The policy will be introduced following a suggested 3 month implementation period from the date of any legislation.
67. We consider that it is reasonable to assume that any familiarisation costs only fall on those vehicle owners who are not currently subject to the Operator licence regime. DVSA estimate³⁵ that 25% of HGVs and 30% of buses, coaches and minibuses are privately owned and not subject to Operator licensing. The familiarisation cost is calculated as before but as it only affects a smaller number of operators, the total cost estimate is **£341,137** in the first year only.

Enforcement cost

68. Following discussions with DVSA we estimate that each MOT test will take one minute longer than it currently does, given that testing technicians are already inspecting the condition of tyres on vehicles, so checking the age of front axle tyres is not expected to add significant time to a test duration. We have assumed the cost imposed by this is one minute per owner/operator plus one minute per MOT

³³ Unpublished DVSA data, 75% of HGVs and 70% of buses, coaches and minibuses are operated commercially under Operator licences

³⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/811054/banning-old-tyres-impact-assessment.pdf [last accessed 13/02/20]

³⁵ Unpublished DVSA data, 75% of HGVs and 70% of buses, coaches and minibuses are operated commercially under Operator licences

technician involved. We estimate their wage rates of £8.72³⁶ and £9.40³⁷, respectively per hour, plus 30% of non-wage employment costs. The enforcement cost is estimated to be **£70,888** in the first year, taking into account the increased duration of MOT tests to allow the age of tyres to be checked, for those vehicles currently outside of the Operator licence regime. DVSA currently check the age of tyres fitted to steering axles of vehicles subject to Operator licensing. To account for an increase in the number of vehicles in line with GDP growth, we have increased this annual cost estimate slightly over the following nine years, based on HMT's GDP deflator³⁸ before discounting it.

Table 9: Discounted cost of enforcement under Option 2 (£, 2019 prices, nominal)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total	70,888	70,134	69,389	68,718	68,055	67,397	66,746	66,101	65,462	64,830

Total cost of Option 2

69. In total, the above costs add up as shown in Table 10 for policy Option 2

Table 10: Discounted total costs under Option 2 (£, 2019 prices, nominal)

	TOTAL	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Low	1,612,964	634,809	121,511	118,050	114,632	111,376	108,232	105,238	102,384	99,664	97,069
Central	2,029,834	790,528	157,644	152,273	146,923	141,843	136,952	132,309	127,902	123,717	119,742
High	2,444,523	945,382	193,594	186,324	179,051	172,158	165,526	159,244	153,292	147,650	142,301

Business Impact Target Calculations

Heavy vehicles by ownership

70. The ban on older tyres proposed is universal and applies to all vehicle owners/operators. In presenting the costs, it is important to separate out those costs borne to private individuals and those to businesses. This is necessary to establish a robust equivalent annualised net direct cost to business (EANDCB). The breakdown of heavy vehicles by ownership is included in Table 11. As can be seen, the majority of these vehicles are company owned, however a significant proportion of minibuses are owned privately.

Table 11: Business Owners

	Company	Private
Bus / coach (non mini)	94%	6%
Minibus	70%	30%
Heavy Goods vehicles over 3.5t	91%	9%
Weighted average	89%	11%

Source: DfT/DVLA statistics (unpublished)

³⁶ <https://www.gov.uk/national-minimum-wage-rates> [last accessed 14/02/20]

³⁷ https://www.payscale.com/research/UK/Job=Automobile_Mechanic/Hourly_Rate [last accessed 14/02/20]

³⁸ <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-december-2019-quarterly-national-accounts> [last accessed 13/02/20]

Total cost to business of replacing tyres early Policy Options 1 and 2

71. The options are valued over a 10-year appraisal period, with a 2019 base year and a 3.5% discount rate. The equivalent annual direct cost to business is discounted to 2019 in 2019 prices. For the purposes of the Business Impact Target, to compare policies equally across this Government, 2019 prices are discounted to 2016 prices.
72. Apart from enforcement costs falling on DVSA, all costs are allocated 89% - 11% to business and non-business owners respectively based on Table 11 above.

Table 12: Cost Impact to Business (£m)

	Business Net Present Value	EANDCB	BIT Score
Option 1	-38	4.4	n/a
Option 2 (preferred)	-1.2	0.1	n/a

Benefits and Break-Even Analysis

Option 0 – Do nothing

73. There are no benefits associated with Option 0 as this is the baseline against which all other options are compared. Over the past 10 years, there have been two collisions for which tyre age was concluded as a contributory factor (the vehicles at fault in the 2012 and 2017 collisions had tyres aged 19 and 18 years respectively). In total, there were 8 fatalities. There is no evidence available to the Department of other collisions that have occurred as a result of the failure of older tyres.
74. In recent years, guidance regarding the use of older tyres has been introduced. However, around 0.16%³⁹ of vehicles are still observed to have tyres older than ten years on their steering axle. It is not clear what the counterfactual risk of a fatal collision is. Therefore, we have decided to assess how many collisions would need to be avoided to make the policy cost neutral.

Options 1 and 2

75. The total discounted cost to society of Option 1 is assessed to be £50.4m. Using the average value of prevention per fatality per road collision (£2.2m⁴⁰), in order to be cost neutral, this **option would need to prevent 23 fatalities** over the next ten years to be cost neutral. The total discounted cost to society of Option 2 is assessed to be £2.1m. Applying the same logic, this policy **option would need to prevent 0.9 fatalities** over the next ten years to be cost neutral.
76. There are other potential benefits that also have not been monetised. There may be other collisions caused in full or in part by older tyres on HGVs, buses, coaches and minibuses causing monetary damage and injury that have not resulted in high profile inquests and as such are not factored in here.

³⁹ DVSA provided unpublished 2018 data on annual and roadside inspections (first test and retests) of HGVs, buses, coaches and minibuses. Out of the nearly 2,700 HGVs, 81,000 buses and coaches, and 3,200 minibuses inspections, only a small minority had at least one tyre aged 10 years or above on the front steering axle (0.15%, 0.06% and 0.28% vehicles respectively).

⁴⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/755698/rrcgb-2017.pdf [last accessed 13/02/20]

77. Additionally, there has been no quantification of the benefits associated with a reduction in other costs of a collision. These would include: the cost of replacement vehicles, road repairs, time costs due to closed carriageways and emergency and hospital services.
78. There are further potential non-monetised benefits that should be recognised in Option 1. The Coroner's report identifies that older tyres were a causal factor in tyres failing on the steering axle. This option bans the use of older tyres on all axles, implying there may be fewer tyre failures on these axles, compared to the counterfactual. Tyre failures are likely to cause issues in steering control, and can contribute to collisions. Therefore, it is expected that banning tyres from all axles may reduce the number of collisions. As we do not have evidence or examples of cases where the failure of a rear axle tyre led to a collision, it is not possible to monetise these impacts.

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

79. This policy aims to remove tyres aged 10 years and above on all HGVs, buses, coaches and minibuses in use in Great Britain. Using latest figures⁴¹, this is around 690,000 vehicles. However as only a small minority of these vehicles – around 1100 or 0.16% based on 2018 DVSA data⁴² - are estimated to have older tyres fitted to steering axles, a proportionate level of analysis has been conducted in this impact assessment.
80. Evidence from the two fatal collisions of 2012 and 2017 concluded that the age of the tyre, which were over 10 years old in both cases, contributed to tyre failure. There has been publicly available information online⁴³ advising operators to replace tyres by the 10 year point, as well as the DVSA roadworthiness guidance⁴⁴ for buses, coaches and HGVs. Given that a minority of vehicles are still fitted with tyres aged 10 years or older, evidence suggests that operators of these vehicles are not self-regulating tyre use to the socially optimal level. As such, government intervention is necessary, justifying the use of an impact assessment to outline the impacts of such intervention.

Impact on Owners of Vehicles of Historic Interest

81. The lack of assessment of costs to historic vehicles was raised by consultees. Given the exemption these vehicles when not operating commercially and that we are only applying the ban to front axle tyres we do not consider that it is proportional to perform an assessment of costs for these tyres, since we consider the costs to be small.

3. Risks, assumptions and unintended consequences

Risks

82. As highlighted elsewhere in the IA, the evidence on the risk from old tyres is circumstantial and not conclusive. This creates a risk that the policy may not improve road safety. However, it would have

⁴¹ <https://www.gov.uk/government/organisations/department-for-transport/about/statistics> [last accessed 13/02/20]

⁴² DVSA provided unpublished 2018 data on annual and roadside inspections (first test and retests) of HGVs, buses, coaches and minibuses. Out of the nearly 2,700 HGVs, 81,000 buses and coaches, and 3,200 minibuses inspections, only a small minority had at least one tyre aged 10 years or above on the front steering axle (0.15%, 0.06% and 0.28% vehicles respectively).

⁴³ <https://www.kwik-fit.com/tyres/information/tyre-age> [last accessed 13/02/20], <https://www.theaa.com/driving-advice/safety/tyre-life-and-age> [last accessed 13/02/20], <https://www.michelin.co.uk/auto/tips-and-advice/advice-auto/when-to-replace-tyres> [last accessed 13/02/20], <https://www.blackcircles.com/helpcentre/tyres/age-of-a-tyre> [last accessed 13/02/20]

⁴⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785463/guide-to-maintaining-roadworthiness-commercial-goods-and-passenger-carrying-vehicles.pdf, Section 5.2. [last accessed 13/02/20]

prevented the two collisions (and 8 deaths) considered, and it is reasonable to assume it will benefit road safety.

83. If there is non-compliance with the policy there is a risk that it will not achieve its objectives. The maximum punishment for non-compliance is far in excess of the cost of replacement tyres (£5000) and the regulations will become part of the MOT test, ensuring all owners/operators are aware of the regulation.
84. There is also a risk that drivers may replace their tyres for the period of the monitoring process (annual testing), but revert back to their older tyres after this. This would result in the policy objective not being met, as essentially no change is made compared to the baseline scenario. The likelihood of this is expected to be very low: there is little incentive for operators to do this, and the existence of roadside checks increases the probability of being penalised.
85. If the scope of the policy was as per Option 1 (affecting all tyres on all axles with a ban on re-treaded tyres of any age on the front axle) there is a risk that the waste and disposal services are unable to handle the additional tyre disposals borne from the policy leading to significant environmental costs. This does not prevent the policy from meeting its objective of improved road safety, but may increase the costs and worsen health outcomes. Given that our preferred option only applies to a small proportion (0.16%) of the HGV, bus, coach and minibuses tyre market this risk is much smaller and impacts on the waste and disposal services will be minimal.
86. A potential risk is whether imposing a tyre age limit could lead to unintended consequences around the quality of tyres. Such consequences could include firms no longer designing tyres to last longer than 10 years or tyre quality (in how it extends the lifetime of a tyre) no longer featuring in the consumers decision making process. This risk is unlikely to materialise as all tyres on the UK market must meet UNECE international regulations on tyre construction (UNECE regulations 30⁴⁵ & 54⁴⁶, 108 & 109⁴⁷). As such, there is no low-high quality differential, as all must meet a set international standard.
87. There is a risk that this has a cost on international hauliers entering the UK, who will not be subject to these conditions in their country of origin. However, we believe the risk to be minimal since international hauliers are highly likely to be covering sufficient distances to replace their tyres well before the 10 year limit.

Assumptions

88. In order to calculate the average number of tyres on a HGV, it has been assumed that steering axles are fitted with single tyres and rear axles are fitted with twin. It has been assumed that all trailer axles are fitted with single tyres. It has been assumed that all minibuses have 4 tyres and all buses and coaches have 6 tyres. These assumptions have been made in lieu of robust appropriate data detailing the average number of tyres by vehicle type. No challenge to this or further data was presented at consultation.
89. The total number of HGVs, buses, coaches and minibuses are assumed to increase in line with GDP growth over the 10 year appraisal period, we have increased annual cost estimates slightly over the following nine years, based on HMT's GDP deflator⁴⁸, before discounting it.

⁴⁵ <https://www.unece.org/trans/main/wp29/wp29regs21-40.html> [last accessed 13/02/20]

⁴⁶ <https://www.unece.org/trans/main/wp29/wp29regs41-60.html> [last accessed 13/02/20]

⁴⁷ <https://www.unece.org/trans/main/wp29/wp29regs101-120.html> [last accessed 13/02/20]

⁴⁸ <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-december-2019-quarterly-national-accounts> [last accessed 13/02/20]

90. It has been assumed that bus and coach tyre prices are the same as HGVs, and those for minibus tyres are the same as for van tyres. This is because bus and HGV tyre prices tend to be listed together⁴⁹, as do minibus and van tyre prices. A tyre industry stakeholder confirmed the validity of these assumptions at consultation.
91. Our tyre cost assumptions were included in the published consultation stage Impact Assessment⁵⁰. The analysis assumes that real tyre prices do not change over time. This has been assumed, due to a lack of information regarding tyre price forecasts. Constructing a tyre price forecast at this stage may be disproportionate given the proportion of old tyres explored in this assessment. Data to challenge the assumption that real tyre prices do not vary significantly over time was sought at consultation, but the tyre industry response outlined the difficulty in generating this forecast. They highlighted that tyres are supplied to the UK from all over the world in a competitive market, with multiple, unpredictable factors influencing their prices.
92. The analysis assumes that old tyres reach the end of their lifetime when they are aged around 13 years. This is based on DVSA data; it is assumed this is around when the tyres will be scrapped, in lieu of available data. The data is focused on fitted tyres, rather than the age at which old tyres are scrapped. This age is therefore likely to be an underestimate. This does not influence the policy objective, but may alter the overall costs; sensitivities have been run to test this. The data gathered by DVSA on the tyre demographic was based on the front steering axles of vehicles and made no distinction between first life tyres and re-treads.
93. Consultation responses did not provide any cost estimates for tyre disposal costs. Discussion with an industry expert during the consultation provided the information that the disposal of an old tyre for recycling costs the owner between £10 and £20 per tyre. For the cost estimates in this impact assessment we have used this range with a central estimate of £15 per tyre. This cost was not included in the consultation stage IA.
94. The costs presented are likely to be overestimates. In the analysis, it is assumed that an individual will buy a new tyre if they are required to replace an old-aged tyre. In reality, an individual may purchase a second-hand tyre instead. This does not affect the policy objective, but could result in the true cost being much lower than what is presented in this assessment.
95. As explained above, enforcement costs are estimated based on discussions with the DVSA enforcement team and assume that each MOT test will take one minute longer than it currently does once our preferred option is introduced, given that testing technicians are already inspecting the condition of tyres on vehicles, so checking the age of front axle tyres is not expected to add significant time to a test duration. Enforcement cost makes up around 30% of the total of preferred option. Issues raised at consultation focussed on the potential costs to operators in meeting the requirements of a ban on tyres aged 10 years or older on all axles and on the visibility of date markings. These issues are no longer applicable in our preferred option.

4. Wider impacts

Small and Micro Business Assessment (SaMBA)

96. This policy will apply to small and micro businesses. It is likely that costs to business will fall primarily on small and micro businesses or private individuals because we expect large businesses will not operate

⁴⁹ <https://www.bigtyres.co.uk/HGV-tyres-bus-tyres.html>, <https://www.maxxis.co.uk/tyres/heavy-HGV-and-bus>, <https://www.snapdeal.com/products/HGV-bus-tyres?sort=plrty>, <https://www.apollotyres.com/cv/tyre-finder/tyres/> [all last accessed 13/02/20]

⁵⁰ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/811054/banning-old-tyres-impact-assessment.pdf [last accessed 13/02/20]

the 0.16% of vehicles using tyres over 10 years old. The majority of vehicles covered by this legislation are owned by companies:

	Company	Private
Bus / coach (non minibus)	94%	6%
Minibus	70%	30%
Heavy Goods vehicles over 3.5t	91%	9%

Source: DfT/DVLA statistics (2019)

97. These companies tend to be in industries dominated by small and micro businesses⁵¹:

494 Freight transport by road and removal services (HGVs)

All employers	20,720	250	27,395	100.0	100.0	100.0
Micro (1 - 9 employees)	17,055	57	5,438	82.3	22.8	19.9
Small (10 - 49 employees)	3,035	61	7,343	14.6	24.4	26.8
Medium (50 - 249 employees)	555	52	6,311	2.7	20.8	23.0
Large (250 or more employees)	75	79	8,303	0.4	31.6	30.3

493 Other passenger land transport (buses, coaches and minibuses)

All employers	7,955	220	16,241	100.0	100.0	100.0
Micro (1 - 9 employees)	5,900	23	1,456	74.2	10.5	9.0
Small (10 - 49 employees)	1,715	35	1,727	21.6	15.9	10.6
Medium (50 - 249 employees)	270	26	1,335	3.4	11.8	8.2
Large (250 or more employees)	70	136	11,723	0.9	61.8	72.2

98. Consultation responses did not yield any data on the proportion of small firms that operate HGVs, buses, coaches or minibuses with tyres 10 years or older. Following discussions with industry stakeholders, the majority of large fleet operators use commercial tyre management contracts and replace their tyres well before 10 years, with 6 years being a more common cut off point. So, it is reasonable to assume that medium and large businesses usually have no tyres aged 10 years or older, so in terms of implementation cost, we estimate that this policy affects almost exclusively small and micro businesses. We have assumed that close to 100% of the total cost to business falls on small and micro businesses.

99. As the policy objective is to improve road safety, we do not consider alternative approaches to regulation for these firms a viable option, or that an exemption is appropriate. Because most of the tyres affected will be fitted to vehicles operated by small and micro businesses or private individuals, an exclusion would largely undermine the policy.

100. However, some vehicles (agricultural and historic) have been excluded where they are not operating commercially.

Trade Impact: is this measure likely to impact on trade and investment?

101. We do not consider that a 10-year age limit as per our preferred option will present a technical barrier to trade, for example, by preventing HGVs from other countries from driving on Great Britain's roads⁵² if fitted with tyres aged 10 years or older on the front axle. The likelihood that vehicles that cover cross-continental distances will have tyres aged 10 years or older is small. This same point is likely to hold for GB exports delivered to the EU by GB HGVs. Consultees were unable to provide data on the age

⁵¹ <https://www.gov.uk/government/statistics/business-population-estimates-2018> [last accessed 13/02/20]

⁵² As a proposed ban on tyre age would apply in GB only (under the Road Traffic Act), separate measures would be needed for Northern Ireland. The Department for Infrastructure (DfI) in Northern Ireland wish to ensure legislative alignment on this important safety matter and plan to consult on this separately, in due course.

profile of tyres from non-GB registered vehicles operating in GB. In order to assess whether vehicles entering GB are compliant, the date of the tyres will need to be examined, meaning the date code will have to be visible. The date code is required by an international standard so this will not impose a barrier. We intend to notify the EU of our intention to change this technical standard giving member states the opportunity to comment on our proposal.

Competition Assessment

102. The competitiveness of certain firms may be affected by this policy. Businesses operating old tyres, who are now faced with the costs of replacement may become less competitive. Given the low number (0.16%) of old tyres observed from DVSA data and the existing roadworthiness guidance advising against the use of tyres aged 10 years or older we anticipate this impact to be small. Tyre sellers who in the absence of regulation would sell tyres aged 10 years and above will not be able to. We are not aware of any evidence to suggest that there is a market for the sale of tyres aged 10 years or older for use on the front axles of in-scope vehicles, so do not expect this to be significant issue.
103. Furthermore, significant negative impacts are expected under policy Option 1 (which included a ban for re-treaded tyres of any age from the front axles) for companies producing and trading in re-treaded tyres. These have not been considered in detail since this is not the preferred option.

Environmental Assessment

104. A number of consultees raised the potential environmental impact associated with the disposal of any non-compliant tyres. Based on the option included in the consultation (Option 1), which would apply to a much larger population of tyres than our preferred option (Option 2), the tyre industry estimated that this could lead to a 40% increase in the number of tyres requiring end-of-life recovery. The industry stated that there is a shortfall in UK recovery capacity and estimated 30% of end-of-life tyres are currently exported to developing countries, typically for incineration in cement kilns or pyrolysis with uncertain environmental consequences. Industry consider that these exported tyres represent a loss of opportunity for higher-value recovery in the UK with better environmental outcomes (increased resource efficiency, reduced CO2 emissions, improved air quality, etc). End of life tyres recovered in the UK can be used for artificial sports pitches, running tracks, playground surface, alternative fuel in the cement and steel industries and in concrete reinforcement⁵³.
105. By amending our proposal, compared to the consultation option (Option1), to allow re-treaded tyres to be treated equally to first life tyres, we are recognising the important contribution that the recycling of tyre carcasses to produce re-treaded tyres makes to the environment. Also, as mentioned in the discussion of options above, we have included the disposal costs of tyres to strengthen our analysis, informed by views from consultees.

5. Post Implementation Review

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

<input type="checkbox"/>	Sunset clause	<input type="checkbox"/>	Other review clause	<input type="checkbox"/>	Political commitment	<input checked="" type="checkbox"/>	x	Other reason	<input type="checkbox"/>	No plan to review
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⁵³ <https://tyrerecovery.org.uk/know-tyre-waste/responsible-retailing/> [last accessed 13/02/20]

Since we are proceeding with legislation on a precautionary basis, we recommend a five year post-implementation review period for this policy since this timeframe will permit a valid, statistically significant dataset to be generated.

2. Expected review date (month and year, xx/xx):

1	1
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2	5
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Five years from when the Regulations come into force

3. Rationale for PIR approach:

Circle the level of evidence and resourcing that will be adopted for this PIR (see Guidance for Conducting PIRs):

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

Will the level of evidence and resourcing be low, medium or high?

We expect the level of evidence we can collect to be low and the resourcing associated with this to be low, since we will be using existing enforcement mechanisms to track compliance.

- **What forms of monitoring data will be collected?**

Data from DVSA and MOT annual and roadside tests will be used to monitor the effectiveness of this legislation.

We expect close stakeholder engagement to reveal any unintended consequences of the policy.

By creating the legal requirement, tyre age will be collected in road traffic collision data, which may also build our evidence base

- **What evaluation approaches will be used?**

We will track the compliance rates annually and publish a review five years after the regulations have come into force.

- **How will stakeholder views be collected?**

We will work with industry stakeholder groups (as part of our ongoing engagement) to collate views on this new legislation.

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?
To improve road safety by limiting the age of tyres fitted to the front axles of HGVs, buses and coaches and from all axles	Are there any further collisions due to tyre age? If yes, is this due to an increase in the number of collisions, or an increase in reporting due to awareness caused by the regulation?	Two fatal collisions where the age of tyres was a contributory factor. DfT research Compliance rates are available from the DVSA and will be monitored throughout.	No. Data from DVSA and MOT annual and roadside tests will be used to monitor the effectiveness of this legislation