

<b>Title:</b> Revision of REACH to address asbestos derogation <b>IA No:</b> DEFRA1067  <b>Lead department or agency:</b> Defra  <b>Other departments or agencies:</b>	<b>Impact Assessment (IA)</b>
	<b>Date:</b> 29 October 2013
	<b>Stage:</b> Final
	<b>Source of intervention:</b> EU
	<b>Type of measure:</b> Secondary legislation
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<b>Summary: Intervention and Options</b>	<b>RPC Opinion:</b>
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Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2009 prices)	In scope of One-In, Two-Out?	Measure qualifies as
£510m	£300m	£-29.540m	No	Not applicable

**What is the problem under consideration? Why is government intervention necessary?**  
In 2009, the former Marketing and Use restrictions on harmful substances were replaced by the EU Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). This had an unintended effect of increasing the scope of restrictions on the sale and use of second-hand articles containing asbestos. Under REACH, these now had to be disposed of or have the asbestos content removed if placed on the market, creating potential health risks from disturbing otherwise safe asbestos as well as imposing unnecessary costs on business and others. The UK government alerted the EU to this unintended and unhelpful consequence, and successfully negotiated a derogation from the restriction under specific conditions. The proposal is to amend the UK REACH Enforcement Regulations 2008 to enact the derogation

**What are the policy objectives and the intended effects?**  
- to mitigate wide-ranging and costly implications that the restriction on placing on the market asbestos-containing articles could have for the UK, particularly in the transport, heritage and museum sectors;  
- to enable trade in asbestos-containing articles to take place subject to more proportionate controls, which would not be permitted without derogation.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**  
Policy Option 1 (Baseline): Do nothing; the restriction remains in force without derogation  
  
Policy Option 2: Take up the derogation which allows for continued placing on the market of asbestos-containing articles provided there are conditions to ensure a high level of protection of human health.  
  
Policy Option 2 is the preferred option. It provides legally robust uptake of the derogation, while avoiding unnecessary burdens on British businesses and the public.  
  
The derogation cannot be implemented without legislation so there is no alternative to regulation under this option.

**Will the policy be reviewed?** It will not be reviewed. **If applicable, set review date:** Month/Year

Does implementation go beyond minimum EU requirements?			No		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	<b>Micro</b> Yes	<b>&lt; 20</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)			<b>Traded:</b> n/a	<b>Non-traded:</b> n/a	

*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: \_\_\_\_\_ de Mauley \_\_\_\_\_ Date: 16 November 2013

# Summary: Analysis & Evidence

# Policy Option 1

**Description:** Do nothing; the restriction remains in force without derogation.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2013	PV Base Year 2013	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: 0	High: 0	Best Estimate: 0

<b>COSTS (£m)</b>	<b>Total Transition</b> (Constant Price) Years	<b>Average Annual</b> (excl. Transition) (Constant Price)	<b>Total Cost</b> (Present Value)
<b>Low</b>	0	0	<b>0</b>
<b>High</b>	0	0	<b>0</b>
<b>Best Estimate</b>	0	0	<b>0</b>

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

This is the baseline option that would apply without further action, so there are no additional costs or benefits. Costs arising from the disposal or removal of asbestos from second-hand articles placed onto the market, which would be avoided under the derogation, are assessed as *cost savings* under Policy Option 2.

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

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

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

This is the baseline option so there are no additional costs and benefits.

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

Key assumptions/sensitivities/risks	Discount rate (%)	n/a
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## BUSINESS ASSESSMENT (Option 1)

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>In scope of OIOO?</b>	<b>Measure qualifies as</b>
Costs: n/a	Benefits: n/a	Net: n/a	No	Not Applicable

# Summary: Analysis & Evidence

# Policy Option 2

**Description:** Take up the derogation to allow for continued placing on the market of asbestos-containing articles in the UK, under specific conditions.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2013	PV Base Year 2013	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: £390	High: £690	Best Estimate: £510

<b>COSTS (£m)</b>	<b>Total Transition (Constant Price) Years</b>	<b>Average Annual (excl. Transition) (Constant Price)</b>	<b>Total Cost (Present Value)</b>
<b>Low</b>	0	0.004	<b>0.038</b>
<b>High</b>	0	0.004	<b>0.038</b>
<b>Best Estimate</b>	0	0.004	<b>0.038</b>

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

The cost of applying for exemption certificates is estimated at around £16,000 to businesses and a further cost of processing applications is estimated at £23,000 to Government (issuing authorities) over the 10 years appraisal period in present value terms. This is equal to £1,800 equivalent annual cost to businesses and £2,600 equivalent annual cost to Government, which is small relative to the scale of cost savings (see below).

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

Following previous HSE experience, enforcement costs to public authorities are expected to be small and easily absorbed into other general inspection and enforcement effort. We assume that there is no adverse health impact from continuing to use the articles that contain asbestos due to the requirement to attach conditions to ensure a high level of protection of human health and the scientific consensus as indicated in para 96

<b>BENEFITS (£m)</b>	<b>Total Transition (Constant Price) Years</b>	<b>Average Annual (excl. Transition) (Constant Price)</b>	<b>Total Benefit (Present Value)</b>
<b>Low</b>		41	<b>390</b>
<b>High</b>		74	<b>690</b>
<b>Best Estimate</b>		54	<b>510</b>

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

The derogation is expected to result in estimated equivalent annual cost saving to:

- railways sector (rolling stock, London Underground, and heritage railways) of £16 million;
- road transport sector of £10 million to business (who account for 30% of sales), and a further £24 million to private individuals (who account for 70% of sales);
- acetylene cylinders industry of £4 million

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

- This option would reduce or delay the potential health costs from any increases in exposure to asbestos from disposal of second-hand articles which would not be necessary under a derogation.
- Societal use and enjoyment of asbestos-containing articles would be continued under the derogation. It has not been possible to quantify this in terms of avoided loss of cultural heritage, recreational value and revenue from tourism-related events, as well as loss of existence and recreational value to private owners.

Key assumptions/sensitivities/risks	<b>Discount rate (%)</b>	3.5
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Assumptions are made with respect to individual and business behaviour (regarding disposing of asbestos-containing articles and having the asbestos content replaced), unit costs of replacement and disposal of asbestos content. While we believe we have assessed the most significant sectors, there are likely to be additional potential benefits to other business or domestic uses from the derogation. We assumed no changes in UK trade patterns for this IA. Range of benefit is informed by sensitivity analysis of parameters.

## BUSINESS ASSESSMENT (Option 2)

<b>Direct impact on business (Equivalent Annual) £m:</b>	<b>In scope of OIOO?</b>	<b>Measure qualifies as</b>
<b>Costs:</b> 0.002	No	Not Applicable
<b>Benefits:</b> 35		
<b>Net:</b> -34.548m		

## Evidence Base (for summary sheets)

### Problem under consideration

1. The EU Regulation on the Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) regulates the way chemicals are made, imported, sold and used throughout Europe. It aims to ensure a high level of protection for human health and the environment from hazardous substances while ensuring the efficient functioning of the internal market.
2. In June 2009, REACH repealed the Marketing and Use Directives, which had established a system of restrictions on how certain chemicals could be sold and used in the EU. The individual substance restrictions – including that for asbestos - were introduced into Annex XVII of the new Regulation.
3. While the intent was for the scope of the individual restrictions to remain unchanged, a combination of some of the definitions within REACH and the unique drafting of the asbestos restriction has subsequently widened the scope affecting the sale and use of second-hand articles containing asbestos. The placing on the market<sup>1</sup> of asbestos-containing articles, by both business and by members of the public, is prohibited.<sup>2</sup>
4. REACH defines certain terms – in a very broad manner – that had not been defined in the Marketing and Use Directives:
  - i. *‘placing on the market’* applies to any transfer of custody, rather than to first-hand sale. It includes leasing as well as permanent sale, and payment does not have to be involved;
  - ii. an *‘article’* is an object that is given a special shape, surface or design during production, which determines its function to a greater degree than its chemical composition.
5. The asbestos restriction is the only one in REACH Annex XVII to apply generically to all *‘articles’* and uses, rather than to specific types of article or use. The very broad REACH definitions of *‘placing on the market’* and *‘article’*, combined with the unique nature of the asbestos restriction, has resulted in a substantial and unintended increase in the scope of the restriction from the previous situation under the Marketing and Use Directive.
6. Subsequently, after the Health and Safety Executive (HSE) on behalf of the UK brought this problem to the attention of the European Commission, Annex XVII of REACH has been amended to allow EU Member States to arrange for exemptions from the restrictions under certain conditions, in order to reduce adverse impacts on a range of sectors, while continuing to ensure protection of human health. The provision is not time limited.

### Rationale for intervention

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<sup>1</sup> REACH definition of placing on the market: means supplying or making available, whether in return for payment or free of charge, to a third party. Import shall be deemed to be placing on the market;

<sup>2</sup> The manufacture of articles containing asbestos has been banned in the UK since 1999, so the REACH restriction on placing on the market refers to the supply of second-hand articles. Because ‘import’ comes under the definition of placing on the market, any asbestos-containing articles manufactured outside of the UK where asbestos is not banned cannot be sold for the first time in the UK.

7. Asbestos was a widely used material in the UK until its final ban in 1999.<sup>3</sup> Until the potential health risks from exposure to asbestos fibres were fully understood, it was considered a highly effective material due to its strength, heat resistance, insulating properties and affordable price, and as such, it is still to be found in a substantial amount of articles that are placed on the market.
8. The established policy position based on up-to-date understanding of the risks is that as long as the asbestos is in good condition and properly managed, it is safer to leave it in situ than require mandatory removal of all asbestos content. However, full application of the restriction to second-hand articles would encourage vendors to attempt to remove asbestos from the articles to allow a sale to go ahead and would increase the potential risk of damage to health.
9. In many cases, the asbestos may be inaccessible or structural; to remove the asbestos now may provoke disproportionate health risks from exposure; to remove the asbestos now may not be cost effective; or the asbestos may be integral to the article's purpose, and therefore the mandatory removal of the asbestos (as a consequence of the restriction if the article were to be placed on the market) would be likely to result in the article being disposed of before the end of its service life.
10. Government intervention is necessary to enable conditional trades to take place, which would not be permitted without derogation. Derogation is a way of reducing market barriers imposed by general regulation in cases where externalities in particular situations are not material, whilst maintaining the general regulatory principle.
11. In view of representations made by professionals and relevant stakeholders wishing to continue placing asbestos-containing articles on the market, the UK is planning to take up this derogation.

### **Policy objective**

12. There are two overarching policy objectives:
  - To avoid unnecessary costs on business and the public by unduly disposing of valuable articles or disrupting legitimate markets; and
  - To reduce any potential detrimental impacts on health from unnecessary disposal or treatment of existing products containing asbestos.

### **Description of options considered**

#### *Policy Option 1 (Baseline): Do nothing*

13. Policy Option 1 is the baseline option. If the UK takes no action regarding the derogation opportunity, then the REACH restrictions on placing asbestos-containing articles on the market will continue to apply.

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<sup>3</sup> Usage began to decline in the 1970s and blue asbestos (crocidolite) had a voluntary ban in 1970. Blue and brown (amosite) asbestos were banned by law in 1985; uses of white asbestos (chrysotile) were banned in 1999.

14. In this Impact Assessment, we assume the baseline year to be the current year (2013), from which the asbestos content of all articles<sup>4</sup> must be removed and potentially replaced with asbestos-free content before they can be placed on the market.
15. Any other options will be compared against this baseline.

*Policy Option 2: Take up the derogation to allow for conditional placing on the market of asbestos-containing articles in the UK.*

16. The UK Government proposes to enact the negotiated derogation, allowing named authorities to issue exemptions from the REACH restrictions on asbestos, so that certain asbestos-containing articles to be placed on the market, subject to specific conditions ensuring a high level of protection of human health. This will be achieved by amending the REACH Enforcement Regulations 2008 to grant authorities such as HSE the power to issue conditional exemptions from the restrictions.
17. Applications for exemptions would be scrutinised by the authority applied to and consulted upon with affected parties, and if granted would be subject to conditions that ensure there is no additional risk of exposure to any asbestos fibres.
18. Any exemptions will be granted via a certificate in writing and will be time-bound. Applicants will need to submit a business case justifying why an exemption is required, and conditions will be attached which ensure a high level of protection of human health. In this way, the UK can promote the interests of UK business and society by allowing the managed placing on the market of asbestos-containing articles.
19. HSE and Defra legal advisors have confirmed that a minimal legislative amendment is necessary to take full advantage of the derogation opportunity.
20. These objectives are in line with Defra's overarching objectives<sup>5</sup>.

### **Monetised and non-monetised costs and benefits**

21. Costs and benefits have been quantified and monetised where possible.
22. A number of assumptions have been made to reflect the inherent uncertainties about the impacts of the derogation. In the majority of cases (where indicated), these assumptions have been informed by extensive informal consultation with industry and other stakeholders, and revised where possible to reflect responses gathered during formal consultation. These assumptions are detailed where appropriate as well as in the Risks and Uncertainties section (paragraphs 123 - 130).

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<sup>4</sup> Advice from the Commission Legal Service concludes that as REACH belongs to the realm of Union legislation on free movement of goods, buildings do not constitute articles so long as they remain fixed to the land on which they stand. This means that buildings are outside the scope of this restriction.

<sup>5</sup> Defra's objectives are:

1. to promote the interests of the British people by making full use of derogations in EU requirements where it benefits the UK;
2. to avoid creating unnecessary burdens on UK business;
3. to safely and proportionately manage the legacy of asbestos usage in the UK.

## General assumptions

23. Costs and benefits are assessed over 10 years (2013-2022 inclusive) as the affected articles that have an active service life (such as rail rolling stock) would have been manufactured before 1999 (when the complete ban on new asbestos usage in the UK came in to force). Therefore, they could be expected to reach the end of their service life by around 2020. Articles that have a passive service life (such as museum pieces) have a potential of decades of years of service life left and a selection of a longer appraisal period would be arbitrary. Therefore, a 10 year-appraisal period has been chosen in accordance with the general advice in the Better Regulation Executive Impact Assessment toolkit.
24. A price base year of 2011 is adopted for all impacts. A discount rate of 3.5% is used for costs and cost savings, in line with the HM Treasury<sup>6</sup> guidance.
25. All costs and benefits are calculated for the United Kingdom (Great Britain and Northern Ireland).
26. Wage data is taken from the Office for National Statistics' Annual Survey of Hours and Earnings (ASHE) 2011.<sup>7</sup>

### Policy Option 1 (Baseline): Do nothing

#### *Background*

27. Policy Option 1 (Baseline) is the situation that would arise if no action were taken (status quo). If the UK takes no further action (no derogation), the full EU restriction is in force with all its unintended consequences, and the placing on the market of any article that contains asbestos is prohibited.
28. In many cases (examples of which can be found in the following analysis), the service life of the article is such that if the article is restricted from being placed on the market (due to its asbestos content), it will either need to have all the asbestos removed and potentially replaced with asbestos-free content, or it will need to be disposed of before the end of its service life.
29. Costs and benefits of other options are compared against this baseline. Therefore, there are no *additional* costs or benefits resulting from Policy Option 1; the costs arising from the restriction that would be avoided under derogation (relating to the removal of asbestos or disposal of second hand items to be placed on the market) are assessed under Policy Option 2.

### Policy Option 2: Take up the derogation to allow for continued conditional placing on the market of asbestos-containing articles in the UK.

30. Under this option there would be overall cost savings as compared to the baseline.
31. There would also be additional costs to duty holders in applying for exemption certificates and responsible authorities in processing and issuing the exemption certificates. However, these costs are small relative to the benefits to business.

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<sup>6</sup> [http://www.hm-treasury.gov.uk/data\\_greenbook\\_index.htm](http://www.hm-treasury.gov.uk/data_greenbook_index.htm)

<sup>7</sup> This has been updated from ASHE 2010 from the consultation-stage impact assessment in order to ensure consistency with the 2011 price base year.

32. We do not expect any additional exposure to asbestos fibres and associated detrimental health effects, as the derogation will reduce the incentive to unnecessarily disturb and remove asbestos fibres. Exemptions can only be granted if they are accompanied by specific conditions to ensure a high level of protection of human health. In addition provisions in the Control of Asbestos Regulations regarding safe risk management of asbestos will continue to apply.
33. The costs and cost savings that this policy option could present to the main affected groups are summarised below; more detailed analysis can be viewed in the relevant annexes.

### **Affected Groups**

34. Due to its versatility as a manufacturing material, asbestos can be found in a large and varied range of articles. It is impossible to list them all so a selection of sectors has been included in this assessment, which represents and best illustrates the significance of this restriction. The main affected groups analysed in this impact assessment are:
  - Railways
  - Road transport
  - Industry
  - Museums
35. Responses to the formal consultation identified several additional sectors as being affected by the restriction and hence by the proposed derogation:
  - Defence and aerospace sector
  - Agricultural and industrial machinery
  - Antiques and auction trade
  - Special interest historical groups that use or display equipment which contains asbestos
36. In the interest of proportionality, we do not investigate these groups further. We consider that the sectors analysed in detail provide an indication of the potential magnitude of cost savings from the derogation. Cost savings to the additional industries listed above could also be large, such that total cost savings (and total net benefits) could be somewhat higher if they were included.

### **Consultation responses**

37. Prior to formal consultation, an extensive informal consultation was undertaken to inform this impact assessment. This covered a wide range of stakeholders, including trade associations, membership bodies, other industry representatives and representatives of SMEs.
38. All the stakeholders consulted were asked to provide estimates of full unit costs of replacing any asbestos-containing parts as well as full unit costs of potentially disposing of the asbestos-containing articles. This including cost of material, labour, disposal and any other appropriate costs. Within these estimates, there may be an element of social desirability and/or biased answers (e.g. inflated costs to ensure the UK take the derogation) – where possible, industry estimates have been validated against estimates from other respondents and publically available information.



39. A four-week public consultation was carried out from 18<sup>th</sup> July 2013 to seek views on the proposals and analysis undertaken for the consultation-stage impact assessment<sup>8</sup>. A total of 27 responses were received from a range of sectors. A large majority of respondents were in favour of the UK adopting the derogation. A summary of responses and Government response to consultation is published alongside this Impact Assessment.
40. There was a mixed response to the question of whether the sectors which may be affected by the REACH restriction on asbestos had been properly identified. Most respondents agreed that their own sector had been correctly identified, but could not comment on others'. Respondents suggested that the defence and aerospace sector, certain types of agricultural and industrial equipment, the antiques and auction trade, and special interest historical groups would also be affected by the REACH restriction.
41. Most respondents agreed with the assumptions that had been made in the Impact Assessment with respect to their own sectors. The largest disagreement came from the museums and heritage sector, which felt that the Impact Assessment did not adequately cover the range of asbestos-containing items which can be found in the sector.
42. Most respondents agreed that the Impact Assessment gave an accurate representation of the costs and benefits of the impact that implementing this derogation may have. Some commented that the costs and benefits were conservative.
43. There was a mixed response to the question of whether the estimated costs associated with applying for an exemption certificate were valid representations of (1) the time taken, and (2) the managerial position of the applicant. Whilst responses were equally split between those who agreed and those who disagreed, a number of respondents from the museum and heritage sector commented that the exemption process in general would be too expensive for the sector.
44. Where appropriate, the present analysis has been updated to reflect responses to the formal consultation. Further details are provided in the relevant section where estimates have been revised.

## **BENEFITS (COST SAVINGS)**

45. Cost savings will accrue to organisations and individuals who gain an exemption under Option 2, as they do not incur the costs of removing asbestos from a second-hand article before placing on the market or in certain cases disposing of the article before the end of its service life (i.e. they avoid costs that would occur in the 'do nothing' case without

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<sup>8</sup> [www.consult.defra.gov.uk/food/reach\\_amendment](http://www.consult.defra.gov.uk/food/reach_amendment)

derogation).<sup>9</sup> There will also be avoided loss of the value associated with the article, in terms of cultural heritage, recreational value and revenue from tourism-related events, where articles would be damaged from asbestos removal or scrapped under the ‘do nothing’ scenario (Policy Option 1). Due to the challenges in deriving heritage and recreational values, estimated cost-savings in this analysis are based entirely on the avoidance of costs associated with stripping asbestos from items that remain in service, or disposal costs from items that are scrapped.

46. The main drivers of these costs savings are the number of items that would be placed on the market in the restriction (base) case, and asbestos removal / scrappage costs. Given the existence of asbestos across a wide range of articles and sectors, informational requirements for this impact assessment are extremely high and, as a result, estimates are necessarily based on a large number of assumptions, derived from extensive consultation with relevant stakeholders and policy experts. As a result, they are subject to a considerable degree of uncertainty. Where possible, low, high and best estimates have been provided, based on corresponding low, high and best assumptions, in order to take some account of this uncertainty.
47. Considering that stakeholder responses to the formal consultation indicated broad agreement with the analysis and assumptions and, in most cases alternative estimates were not provided, we consider that this analysis provides a reasonable indication of the potential magnitude of cost savings from the derogation. Furthermore, given we have not investigated some additional sectors affected by the restriction in this assessment, and, moreover, that we have not accounted for the potential loss of intangible value of heritage articles under the baseline scenario, which could be vast, we expect that total cost savings provided in this impact assessment more likely represent an under- than an overestimate.

## Railways

48. The railways sector is affected since many trains contain asbestos and these trains are made available (via leasing or sale) on a regular basis. The railway sector has been split into three subgroups for analysis. These are: (1) the national rolling stock of trains, (2) London Underground trains and (3) heritage trains.

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<sup>9</sup> Strictly, the additional cost from disposing of an article before the end of its service life under the restriction is the cost of *early* disposal, considering that articles would be disposed of (with associated costs) at the end of their service life under the derogation case. In other words, it is the additional cost of disposing now rather than later, in *present value* terms, that is avoided under the derogation. However, given that disposal/scrappage of articles has only been considered in the present analysis for heritage / museum items, we have not taken account of later disposal costs in our estimates for the following reasons:

- i. The nature of heritage items (as discussed in paragraph 23) suggests the majority will not be scrapped – if at all - until after the end of the appraisal period (2022).
- ii. In any case, for heritage/museum items that may not otherwise be disposed until several decades from now, the effect of discounting would substantially reduce the present value (cost) of disposal in the future. For example, applying the HM Treasury Long Term Discount Rates (see [Green Book](#)), disposal in 20 years would represent only 50% of the cost of disposal now in present value terms, falling to 20% for disposal in 50 years, and only 5% for disposal in 100 years.

For these reasons – and, in addition, considering that the analysis does not quantify avoided loss of value of a disposed items (e.g. cultural heritage and recreational value), among other cost savings, which are potentially very large – we consider that it is more likely that cost savings relating to disposal have been under- rather than overestimated in this impact assessment.

### Cost savings if exemption is granted from the restrictions for the national rolling stock of trains

49. Nationally there are around 4500 asbestos-containing trains being leased. In order to continue in operation, the trains would require the asbestos content removed and replaced at a cost of approximately £14,000 per vehicle<sup>10</sup>, resulting in a total one off cost of approximately £63 million (occurring in the first year of the appraisal period). These costs would be avoided under the derogation (Policy Option 2). Detailed calculations can be found in Annex 1.

### Cost savings if exemption is granted from the restrictions for the London Underground (LU) trains

50. Estimates provided by LU suggest there is an active request for purchase of approximately 30 asbestos-containing trains<sup>11</sup> (equalling 180 cars) currently owned by LU within the next year. Costs to remove the asbestos-containing parts and replace with suitable substitutes are approximately £7,500 per car as indicated by LU. In addition to the removal costs, there are also transport costs for moving the vehicle to a suitable workshop for the removal work to be carried out, which have the potential to add £10,000 per train.
51. LU estimate that the time taken to replace the asbestos-containing parts would be approximately 3 years due to limited capacity of the asbestos removal contractor to undertake the necessary activity. The total cost savings are estimated to be approximately £1.6 million in present value terms over the first three years of the appraisal period (low estimate £1.5 million, high estimate £1.8 million). These costs would be avoided under the derogation and would be cost savings under Policy Option 2
52. We assume that there would be no further demand for the remaining trains (around 250 trains) to be placed on the market, as the removal costs are disproportionate. The active service life of the remaining trains is coming to an end so they would be disposed of regardless of the REACH restriction. Therefore, there would be no cost savings associated with disposing of these remaining trains under the Policy Option 2.
53. Detailed calculations can be found in Annex 2.

### Cost savings if exemption is granted from the restrictions for the heritage railway

54. Heritage railways are active railways as the vehicles are leased, which means they are within scope of the restriction. In addition, many vehicles are loaned for events which also count as placing on the market in the terms of the REACH definition. To continue to be placed on the market so the activities can continue, asbestos-containing vehicles would have to have the asbestos content removed and replaced with an asbestos-free alternative.
55. There are around 840 steam locomotives, 1000 diesel locomotives, 300 diesel multiple units, 2100 coaches and 4200 wagons. This number is based on Heritage Railway Association (HRA) figures and also includes an assumed 10% additional vehicles

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<sup>10</sup> A unit cost of £14,000 is based on information gathered during informal consultation with stakeholders. A further response to the formal consultation suggested that £14,000 is conservative, and that the true cost could be higher, at around £21,000. For the purposes of the analysis, £14,000 is used as the central estimate, while £21,000 is adopted as a higher estimate.

<sup>11</sup> These trains have a potential service life of a further 7 years active use, making it cost effective to remove the asbestos content to allow placing on the market.

belonging to non-HRA members. Due to the age of the vehicles, for the purposes of this Impact Assessment it is assumed that all heritage rail vehicles contain some asbestos.

56. An estimate has been made of the likely proportion of vehicles which would be disposed of before the end of their service life compared to those that may have the asbestos content replaced. Taking this proportion and the unit costs for disposal and replacement for the different types of vehicles (discussed in Annex 3), the total cost of the restriction including HRA and non-HRA members is estimated to be around £77 million (low estimate £51 million, high estimate £88 million).
57. As discussed in paragraph A32 (Annex 3), heritage trains tend to be leased on a fixed-lease basis. Having spread the total cost equally over the 10 year appraisal period, the total net present value cost is equal to around £66 million.
58. This cost would be avoided under Policy Option 2.

### **Total cost savings for Railways sector**

59. Total cost savings for the railways sector (national rolling stock, London Underground and heritage rail) are estimated to be around £130 million over the 10-year appraisal period (low estimate £109 million, high estimate £172 million). These cost savings are seen as conservative as they do not include the savings which would result from avoiding the disruption to operators and customers (e.g. increased journey time, inconvenience) which would happen while vehicles are taken out of service for asbestos removal.

### **Road transport**

#### Cost savings if exemption is granted from the restrictions for preserved buses, coaches, trolleybuses and trams

60. A representative umbrella body for road transport museums and collections - National Association of Road Transport Museums (NARTM)<sup>12</sup> - has provided information and data on the likely impacts on the sector. This is analysed below. A further major UK stakeholder has also provided information about the impacts of the restriction and it broadly supports the information provided by the umbrella body.
61. Under Policy Option 1 (Baseline) if an asbestos-containing vehicle is to be placed on the market, it would have to have all asbestos content removed and replaced. The alternative would be that sales or leases could no longer take place.
62. The number of vehicles that are being placed on the market and would fall under the restriction requirements is assumed to be around 1,000 per year. This estimate is based on stakeholder internal database records.
63. According to the stakeholder, an additional rate of disposing of about 40% is assumed to take place as a result of the restriction (over and above the estimated current rate of scrapping of around 10%).

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<sup>12</sup> NARTM has 99 member organisations and collections. These include national museums such as the Science Museum, publicly funded museums such as the London Transport Museum, Milestones (Hampshire CC), Beamish, Black Country Museum, museums run by charities, private collections, commercial operators of vintage buses and groups or societies of individual members such as the British Bus Preservation Group and the Leyland National Group.

64. Based on the above assumptions, there are estimated to be around 400 vehicles that will be scrapped<sup>13</sup> at a cost of £3,000 per vehicle. This gives a total annual cost of disposing of vehicles before the end of their service life of around £1.1 million.<sup>14</sup>
65. There would remain around 500 vehicles (50% of the total 1,000 vehicles), which would have the asbestos content removed and replaced with an asbestos-free alternative at a unit cost of around £15,000 per vehicle. This gives a total annual cost of removal and remediation of around £7.5 million.
66. Therefore, the total annual cost of either disposing of vehicles before the end of their service life or of replacing the asbestos content, which would result from the restriction, is estimated to be around £8.7 million.<sup>15</sup>
67. The annual rate of turnover (1,000 vehicles per year) is not expected to be static, as a proportion of buses containing asbestos would get scrapped each year, decreasing the total fleet of such buses year by year. A rate of 10% decrease of the 1,000 annual turnover has been suggested by the stakeholder and adopted throughout the appraisal period. Therefore, the present value of the disposing of and replacement cost over the 10 year appraisal period is estimated to be around £43 million (low estimate £39 million, high estimate £48 million).
68. Under Policy Option 2, this sector could apply for an exemption from the restriction: therefore the costs presented would be avoided, meaning an expected best estimate of £43 million cost savings over the 10 year appraisal period (low estimate £39 million, high estimate £48 million).
69. More detailed analysis and calculations can be found in Annex 4 as well as analysis on wider socio-economic and welfare impacts.

#### Cost savings if exemption is granted from the restrictions for cars

70. Under the terms of the REACH restriction, cars qualify as articles and are therefore required to have any asbestos-containing parts removed and replaced with an asbestos-free part if the vehicle is to be placed on the market, i.e. when being sold, donated to a museum or loaned between museums, charitable organisations and individual enthusiasts.
71. According to research published by the Federation of British Historic Vehicle Clubs (FBHVC) in 2011<sup>16</sup>, around 60,000 heritage cars<sup>17</sup> change hands annually and would therefore be subject to the restriction.
72. The total combined cost of disposal before the end of their service life of asbestos-containing vehicles and of the replacement of asbestos-containing parts associated with heritage cars that are expected to be placed on the market is estimated to be around £60 million in the first year of the appraisal period. The total cost of the restriction (early disposal and replacement) in present value terms is £306 million over the 10 year appraisal period.

<sup>13</sup> 1,000 annual turnover of vehicles times the mid estimate of the additional rate of disposing of around 40%

<sup>14</sup> This number is slightly smaller due to rounding

<sup>15</sup> This is slightly higher than the sum of the presented disposal and replacement cost due to rounding.

<sup>16</sup> [http://fbhvc.co.uk/files/2008/12/FBHVC-report\\_final-revised.pdf](http://fbhvc.co.uk/files/2008/12/FBHVC-report_final-revised.pdf)

<sup>17</sup> Any car manufactured prior to 1981 falls into the category of being a heritage vehicle

73. These costs are total cost to society. According to FBHVC, around 70% of owners buy their cars privately. On this basis, total costs to businesses are expected to be around 30% of the total cost to society, or £92 million in present value terms over the appraisal period. Cost to individuals are therefore around £214 million (70% of the total cost to society), in present value terms over the 10 years appraisal period.
74. These costs would be avoided under Policy Option 2.
75. More detail and explanation can be found in Annex 5.

### **Industry**

76. The insulating properties of asbestos mean it was historically used in a wide range of industrial applications, from precision articles (gaskets, rope seals, electrical switchgear etc.) to general all purpose filling (lagging, fireproofing etc.)
77. For the present Impact Assessment we looked at the acetylene cylinders market as a case-study. This is a sector where we have evidence that the impact of the restriction is significant; it is not anticipated that there are many other industrial sectors which will be affected so intensely. This case-study provides an illustration of likely impacts and cost implications where a whole sector is concerned; for other industrial applications the number of articles affected are likely to be less.

#### *Case-study: acetylene cylinders*

78. The stakeholder indicated that they have a total of around 140,000 to 175,000 cylinders containing asbestos in service that are regularly leased. The cylinders would be subject to replacement under the restriction if the systems are to remain in service, estimated to cost around £23 million for the stakeholder. This cost is based on unit cost of replacing the cylinder along with associated costs: the cost of pallets needed for cylinder transportation, changing the supply hoses and cylinder filling rigs (in both cases because the new asbestos-free cylinders will be of a different size) and training cylinder test personnel.
79. This cost would be expected to be fully passed on, partly or wholly, to users in increased product prices. This might lead to indirect costs such as the end users reconsidering the use of acetylene cylinders and opting for a different gas where it was available, which would result in the decrease in the demand and profits to the acetylene industry, though these could be expected to be negated by a corresponding increase in demand and profits in producers of substitute fuels and products. If there was no sufficient substitute to the acetylene, the end users such as welders might reconsider the viability of their operations with the associated possible losses of profit and loss of jobs.
80. These costs and negative secondary impacts would be avoided under Policy Option 2. For more detailed analysis, please see Annex 6.

#### *Other affected industries*

81. Responses to the formal consultation identified impacts on other sectors and industries. In the defence and aerospace sectors, there is high potential for asbestos to have been built into long life cycle equipment, especially in old equipment that may still have a use or value within the sectors.

82. Additionally, agricultural and industrial machinery, for example older second hand farm machinery such as tractors, trailers and plant equipment and machinery, may contain small amounts of asbestos (e.g. in brake linings).
83. More widely, industrial machinery has historically been made with asbestos-containing parts. These machines - which range from airplane engines to turbo-generators - have long service lives. Many have been exported but many remain in service within the UK.
84. While costs to these sectors from the restriction could be considerable, we believe that the case studies presented in this impact assessment provide an adequate illustration of the potential magnitude of cost savings from the derogation, and therefore we do not assess these additional sectors further.

## Museums

### *Background*

85. Asbestos-containing articles make up a substantial proportion of some museums' collections, and their cultural value is extremely difficult to quantify.
86. Museum collections represent an unrivalled source of enjoyment, a study of the historical and technological development of their subject matter, as well as illustrating aspects of the economic, social and cultural life of citizens of the UK and of the world. Due to the comparatively recent prohibition on the use of asbestos<sup>18</sup>, articles both currently in and also desired for collections are likely to be affected by the restriction.
87. Museums in general have a mission of stimulating learning, engagement and enjoyment, while also conserving the collections. Museums are driven by the needs of both existing and target audiences, and aim to create innovative and stimulating cultural programmes that are relevant and reflect the most up-to-date best practice. To restrict what articles can be collected would severely hamper this mission.

### *Restriction*

88. The restriction on placing asbestos-containing articles on the market has two-fold implications for this sector:
  - i.* museums cannot acquire or loan out (or have returned) items currently in their collections for special events or exhibitions,
  - ii.* substantial detriment to museums' reputations, as important items of heritage interest would have to be destroyed (to avoid warehousing costs where items are only owned so they can be lent out) rather than preserved for future generations. The restriction prevents museums from acquiring new articles that contain asbestos for their permanent collections, which restricts their mission and ability to lead the "market".
89. The cost of no longer being able to acquire, lend, borrow or return asbestos-containing articles is difficult and not proportionate to quantify as this has impact upon gallery development, potential donors and sponsors, national public opinion, local economy and international relations.

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<sup>18</sup> Usage began to decline in the 1970s and blue asbestos (crocidolite) had a voluntary ban in 1970. Blue and brown (amosite) asbestos were banned by law in 1985; uses of white asbestos (chrysotile) were banned in 1999.

90. It should also be noted that museums currently holding loans are unable under the restriction to return any articles that contain asbestos. In such cases the museum would be financially liable to continue managing the article on their premises, and may be liable to pay the owner compensation.
91. It would be disproportionate to attempt to quantify the effect of the restriction on the museums sector. A survey of all or a selection of representative museums would be burdensome, it could at best only reduce the uncertainty about how many items might contain asbestos, and could not accurately reflect future behaviour either in staging exhibitions or in the museum-going public.
92. Nevertheless, a range of case studies is presented in Annex 6 which attempt to qualitatively assess the effect the restriction could have on this sector and provide an illustration of the order of magnitude the restriction would have.
93. As can be judged from the case studies, the effect of the restriction would be significant. It is important to note there would be potentially many more museums affected across the UK and therefore the potential effect of the restriction is even greater.
94. Under Policy Option 2 this negative impact on museums could be avoided via the issuing of an exemption certificate.
95. More detailed analysis can be found in Annex 7.

### **Avoided health detriments**

#### *Exposure risk*

96. The UK Government policy position, based on international scientific consensus, is that asbestos in good condition is best managed in situ so as to protect workers and wider society from inadvertent exposure during removal.<sup>19</sup> It is only when asbestos materials are damaged or disturbed that they can release dangerous fibres so the placing on the market of articles with encapsulated asbestos content presents no additional exposure risk. By contrast, if an article could only be placed on the market on condition that the asbestos was removed first it would force the unnecessary disturbance of asbestos fibres that are currently safe and would increase the risk of exposure to dangerous fibres. This risk would be particularly great amongst members of the public who would not have the knowledge or expertise to carry out the task safely.

#### *Restriction in force*

97. The restriction in REACH requires the removal of the asbestos content prior to placing articles on the market. This may result in potential exposure to asbestos fibres for workers and members of the public whilst undertaking the removal work.
98. Training is a legal requirement for workers who are liable to be exposed to asbestos, but not for members of the public who may undertake removal work without the necessary skills and equipment.
99. In addition to the risks of exposure to asbestos fibres whilst carrying out removal works, there is also a range of other potential health and safety risks that may result from the

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<sup>19</sup> The ultimate concern surrounding exposure is asbestosis, a chronic inflammatory and fibrotic medical condition affecting the parenchymal tissue of the lungs caused by the inhalation and retention of asbestos fibres.



requirement to removal asbestos content from articles before they are placed on the market: working at height or in tight areas, manual handling, slips and trips, electrical risk removing asbestos from wiring, etc. This is particularly relevant for heritage items where disposal is often not intended.

*Exemption from restriction*

100. Any exemptions that are granted from the restrictions will have conditions attached to ensure a high level of protection of human health. These conditions may mirror the requirements of the current Control of Asbestos Regulations and will mean that there will be no additional health risks from leaving in place asbestos which is safely encapsulated.
101. The health detriments associated with Policy Option 1 would be avoided under the Policy Option 2. It is not possible to quantify them; however, it is likely that they will be substantial, as the scope of the restriction and the consequential enforced asbestos removal work would affect many sectors as analysed in this impact assessment.

## **COSTS**

102. The proposal is that businesses or individuals affected by the restriction could apply for a certificate granting them exemption. Exemption certificates would only be granted by the relevant authority (e.g. the Health & Safety Executive) after careful consideration. There would be costs associated with such applications to both the applicants and the issuing authority, e.g. administrative resource to apply for and process applications.
103. The draft legal framework in the UK has been designed in such a way as to reduce the burden to a minimum. The intention of the legislation is that an exempting authority may exempt:
- a person or a class of persons;
  - an activity of a class of activities;
  - an asbestos-containing article or class of such articles.

### **Cost of applying for an exemption certificate**

#### *Background*

104. The draft regulations provide for several exempting authorities, depending on the sector. However, for most sectors, HSE would have the responsibility for issuing exemptions and the following illustrative indications of costs are based on their procedures. The process is outside the scope of the decision to proceed with the derogation, although the costs to applicants will remain an important consideration in finalising the arrangements.
105. Once an applicant has decided to request an exemption from the restriction, there is a potential 9-stage process:
1. initial screen
  2. coordination
  3. legal advice
  4. policy input
  5. health and safety text
  6. external consultation
  7. HSE decision
  8. applicant response
  9. internal review
106. There is a range in the complexity of what an application for an exemption certificate may entail. For more basic, one-off, requests<sup>20</sup> the resource implications are reduced whereas for a generic, industry wide request<sup>21</sup> the resource required is more extensive. However, it is important to note that although the total cost of a “class exemption” will be greater the costs for the individual businesses or persons covered by, it will be considerably less than the cost of the sum of individual applications across the “class”.
107. The legal text of the EU derogation stipulates that there should be ‘specific conditions ensuring a high level of protection of human health’. For generic exemption certificates, this will require consultation with experts and industry, e.g. to determine whether the existing requirements of the Control of Asbestos Regulations are sufficient.

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<sup>20</sup> For example, the importation of a piece of machinery for maintenance works so it can be returned to the owner to continue its service life.

<sup>21</sup> For example, one allowing the placing on the market of all museum pieces so museums can exchange asbestos-containing items in their collections for special exhibitions

108. These estimates are derived from resource considerations under an existing exempting regime.

#### *Costs to issuing authority – administration*

109. A request for a one-off certificate for a specific article to be placed on the market may take on average 7 hours of HEO grade time to administer, with 1 hour of oversight from a Grade 7 manager. It would also require 3 hours of Grade 6 lawyer's time and 1 hour of Grade 5 (Senior Civil Service) time to sign into force. The resource implication for the issuing authority to grant such a certificate is therefore estimated to be around £600 per certificate.

110. A certificate issued for a class of activities and applicable to an entire sector would be more complicated to process. A "class exemption" may take 20 hours of HEO grade time to administer, 3 hours of oversight from a Grade 7 manager, 6 hours of contribution from a Grade 7 specialist occupational hygienist inspector, 5 hours of Grade 6 legal time to draft, and 1 hour of Grade 5 (SCS) time to sign in to force. The resource implication for the issuing authority to grant such a certificate is therefore estimated to be around £1,700 per certificate.

111. It is expected that the costs will vary between sectors depending on the cost of staff<sup>22</sup> time in the relevant issuing authority.

#### *Cost to applicant – administration*

112. For the applicant, a basic exemption certificate is likely to take 4 hours for drafting the business case application and a further 2 hours in consultation with the issuing authority. Applications are likely to be made by senior managers<sup>23</sup>. This process would cost industry an estimated £350 per certificate.

113. A class exemption certificate would need to address a range of scenarios and as a result is likely to take 8 hours of time drafting the business case application, with a further 8 hours spent in data collection to support the application. There would be 7 hours of meetings and consultations with the issuing authority to agree conditions. Applications are likely to be made by senior managers. This process would cost industry an estimated £1,300 per certificate, although in these cases the costs would be divided between a number of beneficiaries of the exemption.

#### *Expected demand*

114. The issuing authorities expect to grant 5-6 class exemption certificates in the first year, (as a number of sectors are likely to apply for a blanket certificate, in particular those considered in depth in this Impact Assessment) and then 1 class exemption certificate

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<sup>22</sup> Full economic cost of time (based on hourly wage rate and additional non-wage relate costs) for HSE staff is based on HSE's internal Ready Reckoner 2010-2011, which is the most up-to-date source. The following estimates are used:

HEO grade administrative- around £36/hour;  
Grade 7 administrative- around £58/hour;  
TSol grade 6 (solicitor)- around £72/hour;  
HEO grade administrative- around £36/hour;  
Grade 5 SCS- around £83/hour;  
Grade 7 Occupational Hygienist- around £54/hour

<sup>23</sup> Full economic cost of time of a senior manager is estimated at around £57/hour. It is based on £44/hour wage rate (ASHE 2010 SOC:111 Corporate managers and senior officials) grossed up by 30% to reflect non-wage costs.

every 3 years over the 10 year appraisal period to account for new sectors. The number of one-off exemption certificates, for cases not covered by a class exemption, is expected to be around two certificates per year. These assumptions are uncertain and the numbers could be different. However, the cost of applying and processing an application is relatively small and, as such, we do not expect total cost and net benefit estimates to be sensitive to changes in the number of certificates issued.

115. This gives an estimated net present value cost of around £16,000 to businesses and a further estimated £23,000 to Government (issuing authorities) over the 10 years appraisal period. This is equal to £1,800 equivalent annual value cost to businesses and £2,600 equivalent annual value cost to Government.
116. While a number of respondents to the consultation supported the cost estimates above, several indicated that the costs of applying for an exemption certificate could be higher. For example, respondents from the museums and heritage sector indicated that the lack of a single coordinating body for sector to negotiate class exemptions could lead to protracted discussions and therefore greater costs. In addition, a respondent from industry cited a number of reasons why costs may be greater, including previous experience applying for exemptions under the previous UK Asbestos Regulations, and variability of costs across articles. However, these responses did not provide alternative cost assumptions.
117. Given that costs associated with applying for an exemption certificate are extremely small relative to cost savings from the derogation, total net benefits of the proposal will not be sensitive to changes in exemption costs and therefore we do not assess this further. The costs of applying for an exemption may vary for a number of reasons, and exempting authorities will seek to engage with the relevant sectors to ensure that costs to applicants are minimised.

#### *Costs to competent authorities – enforcement*

118. Costs may arise attributed to enforcing the certificate conditions. As is consistent with the established Enforcement Policy, the approach to enforcement of the competent authorities will be informed by the principles of proportionality in applying the law and exemption conditions, and in securing compliance. This generally means relating enforcement action to the risks to health incurred by non-compliance. These added costs are estimated to be minimal and will be easily absorbed into other general inspection and enforcement effort.

#### **Total costs and benefits and the net benefit**

119. Total costs of Policy Option 2 are estimated to be around £38,000<sup>24</sup>, with
- i. £16,000 to industry, and
  - ii. £23,000 to government,
- in present value terms over the 10 year appraisal period.
120. The total quantifiable benefits (cost savings) are estimated to be around £500 million, with
- iii. £300 million to industry, and
  - iv. £200 million to individuals,
- in present value terms over the 10 year appraisal period.

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<sup>24</sup> Differences due to rounding error

121. The total quantifiable net benefit is estimated to be around £500 million, with  
v. £300 million to industry, and  
vi. The remaining to individuals,  
in present value terms over the 10 year appraisal period.

122. The details can be found in the table presented below. The numbers presented are rounded to two significant figures (may not add up due to rounding).

**Table 1. Total costs, benefits and net benefit.**

<b>COSTS</b>	<b>Best Estimate</b>	<b>Minimum Estimate</b>	<b>Maximum Estimate</b>
<b>Costs to Industry</b>			
Costs of applying for exemption certificates	£16,000	£16,000	£16,000
<b>Total Costs to Industry</b>	<b>£16,000</b>	<b>£16,000</b>	<b>£16,000</b>
<b>Costs to Government</b>			
Costs of issuing exemption certificates	£23,000	£23,000	£23,000
<b>Total Costs to Government</b>	<b>£23,000</b>	<b>£23,000</b>	<b>£23,000</b>
<b>TOTAL COST</b>	<b>£38,000</b>	<b>£38,000</b>	<b>£38,000</b>
<b>BENEFITS</b>			
<b>COST SAVINGS</b>			
<b>Cost Savings to Industry</b>			
Cost savings to buses sector	£43,000,000	£39,000,000	£65,000,000
Cost savings to cars sector	£92,000,000	£64,000,000	£130,000,000
Cost savings to trains sector	£130,000,000	£110,000,000	£170,000,000
Cost savings to acetylene cylinders sector	£32,000,000	£28,000,000	£35,000,000
<b>Total Cost Savings to Industry</b>	<b>£300,000,000</b>	<b>£240,000,000</b>	<b>£400,000,000</b>
<b>Cost Savings to Individuals</b>			
Cost savings to cars sector	£210,000,000	£150,000,000	£290,000,000
<b>Total Cost Savings to Individuals</b>	<b>£210,000,000</b>	<b>£150,000,000</b>	<b>£290,000,000</b>
<b>TOTAL COST SAVINGS</b>	<b>£510,000,000</b>	<b>£390,000,000</b>	<b>£690,000,000</b>
<b>NET BENEFIT</b>			
<b>To Industry</b>	<b>£300,000,000</b>	<b>£240,000,000</b>	<b>£400,000,000</b>
<b>TOTAL NET BENEFIT</b>	<b>£510,000,000</b>	<b>£390,000,000</b>	<b>£690,000,000</b>

## **Risks, assumptions, rationale and evidence that justify the level of analysis used in the IA (proportionality approach)**

123. In this Impact Assessment we have known unknowns, i.e. we have identified the sectors affected and we know that under the restriction terms they would need to have the asbestos content removed and potentially replaced with an asbestos-free alternative if an article is to be placed on the market; however, we do not know for sure what proportion of affected articles would have the asbestos content replaced and what proportion would be disposed of before the end of their normal service life. The stakeholders we have consulted can only estimate how people would behave in the future under the restriction conditions. In addition, although the stakeholders might know the current content of their stock, it is difficult for them to predict what proportion of asbestos-containing articles might be affected by the restriction in the future as many transfers, e.g. loans in a museum, are not planned far in advance. Therefore, we have made indicative assumptions based on sector experts' opinion and the information provided by the stakeholders during the extensive informal consultation exercise and responses to the formal consultation. We have attempted to reduce the uncertainty by varying the best estimate and having a range of maximum and minimum estimates, which are presented in the total costs and benefits section.

### *Buses*

124. The numbers and the associated costs presented illustrate the magnitude of costs. They are based on the UK's restored and preserved vehicle fleet based on NARTM buses. There may be more preserved buses that are not owned by members of NARTM, e.g. operators who specialising in commercial operations such as sightseeing fleets in London or other historic cities such as Bath, Glasgow, etc. There are also operators who have built their business on classic buses and coaches and make their collection available for hire while at the same time operating the vehicles on registered bus services, e.g. Cumbria Classic Bus. Some of these operators also specialise in providing vehicles for film and TV work, though it has not been possible to obtain information on this for the assessment.
125. It is important to note that these are businesses – not just preservationists who are running their restored vehicles for their own pleasure and entertainment. Therefore, the numbers presented could be higher and the cost savings could be also higher. It is has not been possible to obtain additional information through the formal consultation in order to refine estimates; therefore, the analysis and estimates presented should be seen as indicative of the potential magnitude of cost savings.

### *Additional affected sectors*

126. We do know there are other sectors and activities affected by the restriction (i.e. the potential sale of domestic appliances with asbestos-containing parts); however, due to the prevalence of former asbestos usage identifying all potential activities and sectors is impossible.
127. Responses to the formal consultation identified several additional sectors as being affected by the restriction and hence by the proposed derogation:
- Defence and aerospace sector
  - Agricultural and industrial machinery
  - Antiques and auction trade

- Special interest historical groups that use or display equipment which contains asbestos

128. In the interest of proportionality, we do not investigate these groups further. We consider that the sectors analysed in detail provide an indication of the potential magnitude of cost savings from the derogation. Cost savings to the additional industries listed above could also be significant, such that total cost savings (and total net benefits) could be higher if they were included.

*Accuracy of the data and views provided by the stakeholders*

129. It is possible that there might be a degree of bias in the data provided by the stakeholders. This would not be the case for certain estimates, such as the number of vehicles affected as most of the stakeholders, e.g. cars and buses, keep databases of the vehicles that their members own and information about date of manufacture.

130. Certain unit cost estimates (i.e. unit cost to replace asbestos-containing parts in a heritage train) are likely to have higher uncertainty and possible bias around them, where the stakeholders did not have hard evidence of the likely unit costs and provided a judgement-based estimate. The stakeholders would bear the costs of restriction and therefore they might have had an incentive to present the cost higher than they actually would be in order to make a stronger case for an exemption. Where possible, we have critically assessed the estimates provided by cross checking the information provided by different stakeholders in order to mitigate any biases.

**Direct costs and benefits to business calculations (following OITO methodology)**

131. Taking the figures in Table 1, Policy Option 2 offers a Best Estimate of Costs and Savings to business as follows:

Costs	£16,000
Cost Savings	£297,400,000
Net Cost Savings	£297,384,000

These total Costs and Savings are calculated over a 10 year period resulting in an Equivalent Annual Net Saving to Business of £29,539,800.

132. This deregulatory measure is **out of scope** of One-In-Two-Out because the reduction in regulatory burdens is as a result of a reduction in EU obligations. 'Outs' can only be sourced from the removal of 'gold-plating' of EU legislation from an existing regulation, or from a voluntary curtailment of an existing derogation.

**Wider Impacts**

**Small Firms Impact Test**

133. The restriction and hence the derogation would affect different sections of society - individual enthusiasts, commercial dealers, small and big museums, businesses and charitable organisations. For example, the ownership of historic vehicles in public and charitable sector museums is almost equally divided between three main categories – the museum itself, private individuals and others (companies, societies and other charities).

134. Overall, the unit cost of disposing of a vehicle or replacing asbestos-containing parts is likely to be fixed and would not be expected to change with the size of a firm or for private individuals. The total cost of scrapping or replacement would therefore vary with the number of vehicles affected and the size of the organisation/business (the larger the organisation, the more vehicles in scope, and therefore the higher the total costs). However, it is possible that in some cases the unit cost could increase for SMEs due to lack of economies of scale or reduced purchasing power. For example, the cost of replacement of asbestos-containing parts in a steam locomotive is estimated to be around £20,000 to a small heritage railways operator compared to £10,000 to 17,000 to a bigger organisation.
135. Smaller firms also have smaller operating budgets. Therefore, whilst a large firm might be able to absorb the costs in the medium and longer term a small firm might not be able to meet the cost. If this is coupled with an inability to pass the costs onto consumers, they might face the risk of going out of business. For example, a small heritage railways organisation that leases its vehicles on an annual basis may simply not have enough funds to replace asbestos-containing parts in its vehicles (even if it does not have many such vehicles in operation) due to high costs of removal and replacement parts, which might threaten it to close down. If they cannot afford to warehouse the vehicle with the knowledge they will never be able to lease it out, they may choose the cheaper option of disposing of their asbestos-containing vehicles; reducing the attraction to customers would also impact on profits.
136. On this basis and given the fact that the historic or heritage activities involving asbestos-containing articles tend to represent more niche markets with smaller businesses - it seems that SMEs would bear the costs disproportionately and therefore would benefit more than large organisations should the derogation be taken up and the costs associated with the restriction avoided (Policy Option 2).
137. The only cost associated with the derogation (Policy Option 2) is the cost of applying for exemption certificates. As regards generic, industry-wide cases, relevant umbrella bodies and industry associations would apply for blanket exemption certificates covering the whole industry and bear the associated costs. SMEs would be covered by such certificates and therefore would incur minimal costs (if any at all).

### **Wider Environmental Issues Impact Test**

138. There are no wider environmental impacts resulting from the proposed policy (Policy Option 2) as under the derogation the sectors that receive exemptions would not need to take any action with regard to any asbestos-containing articles they are proposing to place on the market.
139. If the restriction remains in force (Policy Option 1), however, – requiring the removal of any asbestos before the article can be placed on the market – then there will be considerable environmental consequences.
140. Asbestos is defined as hazardous waste and must go to specialist waste recycling sites. Recent figures from the Environment Agency indicate that c.340,000 tonnes of waste containing asbestos is dealt with annually; this figure is likely to increase if articles are stripped or disposed of to comply with the restriction. Sites for disposal of hazardous waste may not be able to cope with the extra waste which would lead to environmental costs from transport over greater distances.



141. In addition to the costs of disposing of the asbestos as hazardous waste, there will also be environmental impacts from transporting the larger articles (like rail vehicles and aircrafts) to specialist removal contractors.
142. Removing substantial quantities of asbestos and replacing it with non-asbestos alternatives would require energy consumption across the affected sectors and therefore generate green house gases. It is not considered proportionate to estimate the size of this impact.

### **Summary and preferred option with description of implementation plan**

143. Taking advantage of the derogation allows the UK to manage the legacy of asbestos and ensure that society and businesses are not unduly affected by restrictions that were not in place before REACH and have such far-reaching consequences.
144. Enforcement of the restriction would have a substantial impact upon trade and upon the management of asbestos-containing articles. There would be high financial costs associated with taking no action under Policy Option 1, along with wider intangible costs from the inevitable loss of articles of social and cultural importance.
145. As indicated, the preferred option is to take up the derogation (Policy Option 2) to allow UK named authorities to issue exemptions from the asbestos restrictions in Annex XVII of REACH.
146. Once the regulations are in force Defra ministers will instruct the exempting authorities to proceed with issuing certificates. The exempting authorities will be expected to enter into proactive discussion with the sectors where class certificates will be appropriate, including those identified in this Impact Assessment. These discussions will be used to determine the precise scope of the class exemptions and the conditions that are to apply in order to ensure a high level of protection of human health.
147. There will not be proactive discussion with regard to exemptions for one-off occurrences of placing on the market that are outwith the class certificates. This is because they will by definition only come to view when such a transaction is contemplated. However, the exempting authorities will be expected to publicise the power to issue exemptions along with advice to applicants on the procedures they need to follow.

## Annex 1

### Cost calculations for National Rail rolling stock of trains

#### *Background*

- A1. During the extensive informal consultation, stakeholders provided costs for the replacement of asbestos-containing parts (including cost of replacement materials, labour costs, disposal of waste etc) and the cost of disposing of asbestos-containing articles. Additional information was received in response to the formal consultation. The calculations below have been based on these figures.
- A2. Asbestos was prohibited as a construction and manufacturing material in Great Britain in 1999 so vehicles manufactured prior to this may contain asbestos.
- A3. Due to a major asbestos removal and maintenance programme (which happened before rail privatisation), all British Rail vehicles were subject to a major asbestos removal and maintenance programme. As a result of this, all remaining asbestos in such vehicles is in places inaccessible to untrained persons, and would incur substantial costs to remove and replace with an asbestos-free alternative. A considerable amount of the remaining residual asbestos may require dismantling the vehicles in question.

#### *Baseline fleet of vehicles containing asbestos*

- A4. Evidence provided by the Association of Train Operating Companies indicates that there are three major mainline leasing companies, each with comparable market share. One of these companies estimates that 26% of the 5,800 vehicles they lease to UK train operators do (or may) include asbestos-containing materials.
- A5. In the absence of full information, we have assumed that the remaining two companies would lease a similar amount of asbestos-containing trains to UK Train Operators. Applying a comparable market share assumption and ratio of asbestos containing rolling stock across the 3 leasing companies, suggests that there are around 4500 asbestos-containing vehicles being leased nationally.<sup>25</sup>

#### *Cost saving if exemption is granted from the restrictions*

- A6. The company contacted during the informal consultation estimated that it would cost £21 million to strip the asbestos from their vehicles. This is based on a cost of approximately £14,000 per vehicle for the 1500 vehicles the operator manages. An additional response to the formal consultation indicated that this estimate is conservative, and true costs may be approximately £21,000 per vehicle. For the purposes of the analysis, we have adopted £14,000 as a central estimate and £21,000 as a high estimate. This gives a total cost over 1,500 vehicles of £21 million (or £32 million using the higher unit cost estimate).
- A7. It has not been possible to obtain information as to the extent that train operators will choose to remove the asbestos content of their current vehicle stock and replace it with an asbestos-free alternative, and to what extent they will elect to dispose of the vehicles before the end of their normal service life. However, if operators remove and replace the asbestos content from all of their trains, the total one-off cost would be approximately £63 million (3 major mainline leasing companies multiplied by £21 million cost each), or

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<sup>25</sup> We did not receive information via formal consultation on which to refine these assumptions, so we have retained them for the final analysis.

£95 million using the higher unit cost estimate.<sup>26</sup> For this Impact Assessment, we assume that all operators will choose to have the asbestos removed and replaced (so the affected vehicles can remain in service). This may represent an overestimate where trains are nearing the end of their service life, as operators may choose to scrap rather than incur asbestos removal and replacement costs. However, responses to the formal consultation did not provide additional information on which to revise this assumption.

- A8. Stripping the asbestos content would be the only way to allow a vehicle to continue being leased until the end of its service life; therefore, any removal activity would occur in year one (2013).
- A9. The estimated £63 million (best-estimate) would be avoided if the derogation were taken up (Policy Option 2).

#### *Further considerations*

- A10. Train Operators may also take this opportunity to undertake other refurbishment activities that may improve the efficiency and / or extend the service life of their vehicles. Given the complexity in identifying potential for improving the efficiency of current vehicles, it is not deemed proportionate to quantify or monetise the costs and benefits associated with this.
- A11. The costs of removing the asbestos content from these vehicles may not be fully borne by the train operators as, given that the price elasticity of demand for train travel is relatively in-elastic, costs could be passed on to the fare payer. Costs may also be covered using franchise subsidies and thus be covered by the general tax payer.
- A12. Further business costs and costs to the wider community would result from the disruption to train services while vehicles are removed for asbestos removal. These costs have not been estimated but avoiding them would contribute further to the business benefits attributable to Policy Option 2.
- A13. Additional cost savings could be generated at the end of the service life. There may be demand from a variety of organisations for commercial or cultural use (i.e. heritage railways, museums, research establishments). Under Policy Option 2 an exemption certificate may be granted allowing the articles to be placed on the market for such activities. It has not been possible to obtain data on which to estimate these savings, and given that they are expected to be small relative to other costs, we do not attempt to estimate them further.

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<sup>26</sup> Differences due to rounding.

## Annex 2

### Cost calculations for London Underground

A14. Transport for London (TfL) provided information on the affected fleet of trains and costs for asbestos replacement (materials, labour, disposal etc). The analysis and cost saving estimates presented below are based on the information provided.

#### *Background*

A15. After their use by London Underground, trains may be placed on the market for a range of reasons: they may be sold to be used by other train operators; they may be transferred to museums as heritage items; or sold as collectors' items.

#### *Baseline fleet of vehicles containing asbestos*

A16. Transport for London surveys indicate that 45% of trains in service (around 620) on the London Underground (LU) contain asbestos. This is approximately 280 trains (2000 individual cars).

#### *Case study: Sales-related cost savings if exemption is granted from the restrictions*

A17. The unit costs presented below have been provided by London Underground and are based on labour costs, replacement materials and waste disposal.

A18. London Underground has identified an active request for approximately 30 asbestos-containing trains (equalling 180 cars) to be placed on the market within the next year. These trains have six years of service life left.

A19. The cost of removing the asbestos is approximately £7,500 per car. In addition, there is a transport cost for moving the vehicle to a suitable workshop, which potentially adds £10,000 per train.

A20. Total costs would therefore be in the region of £1.7 million.<sup>27</sup> These costs would be avoided under the Policy Option 2.

A21. London Underground estimates that, due to limited capacity of the removal contractor, it will take approximately 3 years to remove the asbestos from the fleet of trains and replace it with an asbestos-free alternative. Therefore, the cost savings would be spread over the first three years of the appraisal period, with a net present value of £1.6 million.

#### *Disposal of LU trains*

A22. The active service life of the remaining trains is coming to an end within the first year of the appraisal period. Since they are not being sold on, they would be disposed of as waste. This would happen regardless of the restriction and therefore does not create an additional cost associated with it. Consequently, there would be no cost savings under Policy Option 2 associated with disposing of the trains.

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<sup>27</sup> 180 cars having asbestos-containing parts replaced at a unit cost of 7,500 pounds per car (1,350,000 pounds) plus the cost of taking 30 trains to the replacement place at a unit cost of approximately 10,000 pounds per train (300,000 pounds).

### *Further considerations*

- A23. It is possible that removal costs would be transferred to those purchasing the train, who would be expected to gain a revenue from the train fares over the next 6 years to cover these costs. It is likely that the price elasticity for London Underground trains demand is such that the train operators would be likely to transfer the cost of replacement of asbestos-containing parts to the train customers via increased fares.
- A24. Given the increase in costs from asbestos removal, it is likely that the market for enthusiasts and collectors will be affected. It is expected that the increased costs may price some collectors out of the market or London Underground may withdraw from the market and opt to scrap trains at the end of their service life.
- A25. In the interests of proportionality, we have not attempted to estimate these effects further.

## Annex 3

### Cost calculations for heritage rail

A26. Informal consultation provided information on the affected fleet of trains and costs for asbestos replacement (materials, labour, disposal etc).<sup>28</sup>

#### *Background*

A27. Heritage railways are active railways, primarily used for tourism rather than passenger transport. The vehicles are leased from a variety of sources (museums, Train Operators, private collections). To continue to be placed on the market, asbestos-containing vehicles would have to have the asbestos content removed and replaced with an asbestos-free alternative.

A28. Given the age of the vehicles, it is reasonable to assume that all heritage rail vehicles contain some asbestos.

#### *Baseline fleet of vehicles containing asbestos*

A29. The Heritage Rail Association (HRA) represents approximately 60% of railways above 50" gauge (but in actuality nearly all the major players). A stock check in 2008<sup>29</sup> catalogued approximately 770 steam locomotives, 990 diesel locomotives, 270 diesel multiple units, 1900 coaches and 3900 wagons.

A30. HRA data suggests that organisations which are not members of HRA contribute an additional 10% to vehicle numbers<sup>30</sup>. This translates to an additional 80 steam locomotives, 100 diesel locomotives, 30 diesel multiple units, 190 coaches and 390 wagons.

#### *Vehicles affected by the restriction*

A31. It is assumed that all vehicles will be placed on the market at some point over the 10 year appraisal period and, for simplification, it is assumed that this is equal throughout the period.

A32. Heritage rail vehicles tend to be leased on a fixed-period lease and extant leases may expire at any point during the appraisal period. In the absence of information to the contrary, we have assumed an even distribution of renewal of leases (10%) during the appraisal period.

#### *Unit costs of disposing of and replacement*

A33. It is unlikely that the heritage railways would have the same buying power as major leasing companies for stripping out the asbestos, so unit costs are likely to be higher than the £14,000 per vehicle (central estimate) estimated for the national rolling stock.

A34. We are aware of one preserved coach that was stripped in the last two years at an exceptionally high cost of £100,000; however most asbestos removal work is likely to be

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<sup>28</sup> No specific information was provided in response to the formal consultation on which to refine the assumptions in this section.

<sup>29</sup> We have assumed these figures remain accurate, with minor variable for a small number of vehicles being scrapped in the intervening years but a comparable small number of vehicles being added to the collection.

<sup>30</sup> These organisations are likely to be mainly SMEs

£10-20,000 per item (with the best-estimate being about £17,000 to reflect the reduced buying power of these smaller operators).

- A35. It is assumed that asbestos stripping will cost more in diesel locomotives and steam locomotives compared to wagons and coaches due to the size of the vehicles and the complexity of the structures. For diesel locomotives, steam locomotives and diesel multiple units we estimate the cost between £10-20,000.
- A36. In the absence of better data, this estimate is halved (£5-10,000) for wagons and coaches.
- A37. It is assumed that the cost of scrapping will be greater for diesel locomotives and steam locomotives compared to wagons and coaches due to the size of the vehicles. For diesel locomotives, steam locomotives and diesel multiple units we estimate the cost to be approximately £7,000. Due to the uncertainty surrounding this estimate, sensitivity analysis (10% above and below) has been used to provide a range of impact.
- A38. In the absence of better data, the above estimates are halved for wagons and coaches.

*Breakdowns of how vehicles may be affected by restriction*

- A39. It has not been possible to obtain accurate information on the number of vehicles that would be replaced; it depends on a number of parameters, such as the value of the vehicle and warehousing costs. In the absence of data, we have made a number of assumptions, so final estimates are subject to a high degree of uncertainty. However, given that we did not receive information contrary to these assumptions during the formal consultation period, it seems reasonable to assume that they provide a reasonable indication of the potential magnitude of cost-savings.
- A40. Rather than adopting a high level assumption of proportion of vehicles that may be disposed of before the end of their service life versus those that may have the asbestos content removed for *all* the heritage vehicles affected, an assumption has been made for *groups* of vehicles. This is because the pressures that drive behaviour are expected to be very different for various types of heritage vehicles.
- A41. We expect that diesel and steam locomotives and coaches are likely to have a greater value compared to other vehicles and, in the absence of data, have assumed that 80% of them would be stripped of their asbestos content. The remaining 20% would be disposed of before the end of their service life (they are owned to be leased; this activity is now prohibited by the restriction so they would incur warehousing costs for the owner without any future benefit).
- A42. We estimate that in the region of 70% of diesel multiple units would be stripped of their asbestos-containing parts (with the remaining 30% of the vehicles disposed of before the end of their service life), and 55% of wagons stripped of their asbestos content (with the remaining 45% disposed of before the end of their service life).

## *HRA members vehicles*

### *Cost savings under option 2 (disposal)*

- A43. The total cost of disposing of asbestos-containing diesel and steam locomotives is approximately £2.5 million<sup>31</sup>.
- A44. The total cost of disposing of asbestos-containing coaches is approximately £1.3 million<sup>32</sup>.
- A45. The total cost of disposing of asbestos-containing diesel multiple units is approximately £0.6 million<sup>33</sup>.
- A46. The total cost of disposing of asbestos-containing wagons is approximately £6.1 million<sup>34</sup>.
- A47. Therefore, the total cost of disposing of all the affected heritage trains before the end of their service life is estimated to be around £10 million (with a range of £9 million to £11 million using low and high assumptions respectively). This is a cost saving under Policy Option 2.

### *Cost savings under option 2 (removing asbestos so vehicle may be placed on the market)*

- A48. The total cost of removing the asbestos content of diesel and steam locomotives is approximately £24 million<sup>35</sup>.
- A49. The total cost of removing the asbestos content of coaches is approximately £13 million<sup>36</sup>.
- A50. The total cost of removing the asbestos content of diesel multiple units is approximately £3.2 million<sup>37</sup>.
- A51. The total cost of removing the asbestos content of wagons is approximately £18 million<sup>38</sup>.
- A52. Therefore, the total cost of removing the asbestos content of affected heritage trains is estimated to be around £58 million (with a range of £34 million to £69 million using low and high assumptions respectively).<sup>39</sup> This is a cost saving under Policy Option 2.
- A53. Therefore, the total additional cost of disposal and removal is around £69 million (with a range of £44 million to £80 million using low and high assumptions respectively). This would be a cost saving under Policy Option 2.

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<sup>31</sup> Around 350 (20% of the total of 1760) steam and diesel locomotives being scrapped at an average cost of £7,000 per vehicle.

<sup>32</sup> Around 380 (20% of the total of 1900) coaches being scrapped at an average cost of £3,500 per vehicle.

<sup>33</sup> Around 80 (30% of the total of 270) diesel multiple units being scrapped at an average cost of £7,000 per vehicle.

<sup>34</sup> Around 1800 (45% of the total of 3,900) wagons being scrapped at an average cost of £3,500 per vehicle.

<sup>35</sup> Around 1,400 (80% of the total of 1,760) steam and diesel locomotives being replaced at an average cost of £17,000 per vehicle.

<sup>36</sup> Around 1,500 (80% of the total of 1900) coaches being replaced at an average cost of £8,500 per vehicle.

<sup>37</sup> Around 190 (70% of the total of 270) diesel multiple units being replaced at an average cost of £17,000 per vehicle.

<sup>38</sup> Around 2,100 (55% of the total of 3,900) wagons being replaced at an average cost of £8,500 per vehicle.

<sup>39</sup> The sum of all the components, may not add up to the exact number due to rounding.



### *Non-HRA members' vehicles*

- A54. We estimate an additional 80 steam locomotives, 100 diesel locomotives, 30 diesel multiple units, hundred and 190 coaches and 390 wagons that are not members of HRA.
- A55. The same assumptions regarding the proportion of vehicles disposed of early versus those that have the asbestos content removed has been applied as for the HRA members.
- A56. Non-HRA members are more likely to be SMEs and have less buying power than HRA members. To reflect this, high unit costs assumptions from paragraphs A34 to A37 for removal and early disposing have been adopted as follows:
- A57. £20,000 unit cost of removal and replacement, £7,700 unit cost for disposing of for diesel locomotives, steam locomotives and diesel multiple units, and £10,000 unit cost of removal and replacement and £3,900 unit cost of disposing of for a coach or a wagon.
- A58. The burden imposed is estimated to be in the region of £1.2 million (around £0.3 million from disposing of diesel and steam locomotives<sup>40</sup>, £0.1 million from disposing of coaches<sup>41</sup>, £0.06 million resulting from disposing of diesel multiple units<sup>42</sup> and £0.7 million from disposing of wagons<sup>43</sup>) in total.
- A59. The additional cost of removing the asbestos content is estimated to be around £6.8 million (around £2.8 million resulting from disposing of diesel and steam locomotives<sup>44</sup>, £1.5 million resulting from disposing of coaches<sup>45</sup>, £0.4 million resulting from disposing of diesel multiple units<sup>46</sup> and £2.1 million from disposing of wagons<sup>47</sup>).
- A60. Therefore, the total additional cost of disposing of and removal is estimated to be around £8 million. This would be a cost saving under Policy Option 2.

### *Total costs saving if exemption is granted from the restrictions*

- A61. The total cost of the restriction (both early disposal and removal costs) including HRA and non-HRA members is therefore in the region of £77 million (with a range of £52 million to £88 million using low and high assumptions respectively), with a net present value of £66 million (£45 million to £76 million).

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<sup>40</sup> Around 35 (20% of the total 180 diesel and steam locomotives) being scrapped at an average cost of £7,700 per vehicle.

<sup>41</sup> Around 40 (20% of the total of 190) coaches being scrapped at an average cost of £3,900 per vehicle.

<sup>42</sup> Around 8 (30% of the total of 30) diesel multiple units being scrapped at an average cost of £7,700 per vehicle.

<sup>43</sup> Around 170 (45% of the total of 390) diesel multiple units being scrapped at an average cost of £3,900 per vehicle.

<sup>44</sup> Around 140 (80% of the total 180 diesel and steam locomotives) being scrapped at an average cost of £20,000 per vehicle.

<sup>45</sup> Around 150 (80% of the total of 190) coaches being scrapped at an average cost of £10,000 per vehicle.

<sup>46</sup> Around 20 (70% of the total of 30) diesel multiple units being scrapped at an average cost of £20,000 per vehicle.

<sup>47</sup> Around 210 (55% of the total of 390) diesel multiple units being scrapped at an average cost of £10,000 per vehicle.

## Annex 4

### Road transport

#### Buses, coaches, trolleybuses and trams

A62. A representative umbrella body for road transport museums and collections – The National Association of Road Transport Museums (NARTM) - has provided information and data on the likely impacts on the sector. A further major UK stakeholder – The Confederation of Passenger Transport - has also provided data about the impacts of the restriction.<sup>48</sup>

*Cost saving if exemption is granted from the restriction – replacement of asbestos containing parts for all of the fleet of vehicles (maximum estimate)*

A63. NARTM advised that component replacement and labour costs have been generated from separate discussions with three experienced maintenance and restoration experts and are likely to be around £15,000 per vehicle on average. This cost includes the labour cost to replace the parts likely to contain asbestos (e.g. brake linings, clutch friction plates), the cost of the alternative parts as well as the cost of management time and unforeseen problems related to the replacement.

A64. Details on how the costs have been derived are shown below (this has been provided by the stakeholder):

*Detailed information on how the unit cost of asbestos content replacement has been derived*

A65. As indicated by the stakeholder, the following parts found in a preserved bus typically contain or are made from asbestos:

- Brake linings
- Clutch friction plates
- Cylinder head gaskets
- Exhaust manifold and exhaust joint gaskets
- Exhaust heat shields
- Lagging for heater water pipes
- Lagging around exhaust heaters
- Fire barriers around engine compartments – on older vehicles where the driver has a separate cab both alongside the engine and between the engine and passenger compartment; on underfloor- or rear-engined vehicles asbestos has been used under the floor or between the rear engine bay and passenger compartment
- Carburettor drip trays (petrol engines)
- Fuel pipe heat shields (petrol engines)

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<sup>48</sup> Additional information was sought during formal consultation, but no specific information was received on which to refine the assumptions and analysis in this section.

- Noise insulation under floors
- Anti-squeal bands on brake drums
- Floor treads on entrance steps, platforms, gangways and stairs

REPLACEMENT COSTS FOR ASBESTOS CONTAINING COMPONENTS IN HISTORIC BUSES AND COACHES

Component	Replacement unit cost	No.	Total			Labour cost £	Sub- contract cost £	Total cost £		Used until	Notes
			parts cost £	Man hours	Rate			excluding VAT			
Brake linings	40.00	8	320.00	16	45.00	720.00	150.00	1190.00	2000		
Clutch	350.00	1	350.00	15	45.00	675.00	100.00	1125.00	2000		
Head gaskets	100.00	2	200.00	16	45.00	720.00		920.00	1980		Replacements will need to be manufactured
Exhaust manifold and system inc gaskets	500.00	1	500.00	10	45.00	450.00		950.00	1980		Will probably require replacement of much of exhaust system - cost included
Exhaust heat shields	100.00	1	100.00	3	45.00	135.00		235.00	1970		
Heater pipe lagging	4.00	30	120.00	24	45.00	1080.00		1200.00	1960		
Exhaust heater lagging	75.00	1	75.00	2	45.00	90.00		165.00	1975		
Engine bay removable panels	75.00	3	225.00	24	45.00	1080.00		1305.00	1965		Will require repainting of lower parts of cab - cost included
Passenger compartment bulkhead	75.00	2	150.00	40	45.00	1800.00		1950.00	1960		Will require major removal and rebuilding of bulkhead panels with destruction of authenticity
Carburettor drip tray (petrol engines)	30.00	1	30.00	2	45.00	90.00		120.00	1940		
Fuel pipe heat shield (petrol engines)	30.00	1	30.00	2	45.00	90.00		120.00	1940		
Noise deadening insulation (underfloor)	120.00	3	360.00	16	45.00	720.00		1080.00	1960		
Anti squeel bands on brake drums	200.00	4	800.00	2	45.00	90.00		890.00	1960		
Floor treads (entrance steps on single deck)	20.00	5	100.00	2	45.00	90.00		190.00	1960		} low end of range
Floor treads (platform and stairs on double deck)	20.00	40	800.00	16	45.00	720.00		1520.00	1955		} high end of range
<b>Sub-total (excluding VAT)</b>			4160.00	190		8550.00		<b>12105.00</b>			Total takes average of low and high end options for floor treads
Management, unforeseen problems						2992.50		2992.50			Management 10%, unforeseen problems 25%
VAT								3019.50			
<b>Total</b>								<b>18117.00</b>			

A66. These costs include an allowance of 10% of the labour costs for the management time involved in sourcing materials and fixings, ensuring replacement materials are of sufficient performance, training operatives in removal and disposal of asbestos material, and an allowance of 25% of the labour costs for overcoming defects and problems encountered when trying to disassemble and re-assemble old vehicles.

A67. Some of the parts' costs depend on batch production. For example the head gasket prices are based on known unit costs for manufacturing 50 gaskets. For particularly rare vehicles the cost of an individual gasket will be many times this amount.

A68. Since VAT is a transfer cost, it has been excluded from the unit cost estimate in the present impact assessment, so the cost of replacement of asbestos containing parts per vehicle is around £15,000 on average.

### *Baseline fleet of vehicles containing asbestos*

- A69. The stakeholder provided a best estimate of the total number of historic buses and coaches in preservation<sup>49</sup> being some 7,000 vehicles. This number is based on internal stakeholder databases.
- A70. The stakeholder has further provided a breakdown of preserved vehicles by period of manufacture, based on internal databases, and the likely proportion of parts which would contain asbestos. This allows us to calculate an estimated cost of asbestos-containing parts removal and replacement with asbestos-free parts.
- A71. There are about 2,900 pre-1960s vehicles (which make around 41% of the total fleet of preserved vehicles). All parts of these vehicles are likely to contain some asbestos. The total one off removal cost is estimated to be around £43 million<sup>50</sup>.
- A72. There are about 1,500 1960s vehicles (which make around 22% of the total fleet of preserved vehicles). These vehicles are likely to contain asbestos in half their parts. The total one off removal cost is estimated to be around £12 million<sup>51</sup>.
- A73. There are about 2,600 post-1970s vehicles (which make around 37% of the total fleet of preserved vehicles). These vehicles are likely to contain asbestos in a quarter of their parts. The total one off removal cost is estimated to be around £9.8 million<sup>52</sup>.
- A74. The total cost of replacing all asbestos-containing parts in the entire fleet of vehicles is estimated to be around £65 million. Under Policy Option 2, these costs would be avoided and therefore there would be an estimated £65 million one-off cost savings.
- A75. Replacement of asbestos-containing parts is unlikely to occur to the entire fleet of vehicles at a single point in time, since the placing on the market (and hence the requirement to replace such parts) of such vehicles occurs over a period of time
- A76. Also, such high costs of replacement are substantially above the value of many un-restored vehicles. Therefore, it is likely that not all the vehicles would have the asbestos content replaced; some would remain with the owner until they are defined as waste, and a proportion would be disposed of before the end of their potential service life as a consequence of the restriction. This is analysed below as a more realistic scenario, which gives us our best estimate of cost savings under Policy Option 2. Therefore, the £65 million one-off cost is a maximum estimate.

### *Cost savings if exemption is granted from the restrictions – disposal and replacement of vehicles over the appraisal period (best estimate)*

- A77. As stated in the previous section, it is unlikely that the entire fleet of vehicles would have the asbestos-containing parts replaced as (depending on length of service life remaining) it could be cheaper to scrap the vehicles.

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<sup>49</sup> restored, under restoration and awaiting restoration

<sup>50</sup> 2,900 pre-1960 vehicles times the unit cost of replacement of all the parts in the vehicle of around £15,000

<sup>51</sup> 1,500 1960s vehicles times the unit cost of £15,000 times 0.5 to account for only half of parts being replaced (it is unknown what the particular composition of parts that will require replacing is, hence it is assumed that half of the number of parts equates to 50% of the cost)

<sup>52</sup> 2,600 post-1970 vehicles times the unit cost of £15,000 times 0.25 to account for only quarter of the parts being replaced per vehicle. (again, it is unknown what the particular composition of parts that will require replacing is, hence it is assumed that a quarter of the number of parts equates to 25% of the cost)

- A78. The unit cost of disposal depends on the value of scrap metal; when the value for scrap metal is high the cost of disposal is low, and vice versa. The scrap metal market is highly volatile, so the cost of disposal can vary considerably. The cost also varies with other factors, such as the proximity of an available scrap yard and the type and age of a vehicle. The stakeholder consulted suggested that it is likely to be between £2,000 to £4,000 per vehicle. This estimate is adopted for the current analysis. However, as recognised by the stakeholder, the volatility in the scrap market is such that when the value of scrap metal is particularly high, the owner of the vehicle could receive a payment from a scrap metal merchant.
- A79. Only the vehicles placed on the market would be affected by the restriction. For the purposes of this Impact Assessment, we are using the current rate of annual turnover of vehicle ownership (including lease transfers), which is around 1,000 vehicles per year on average, as indicated by the stakeholder.<sup>53</sup>
- A80. The number of preserved vehicles placed on the market declines as a proportion of vehicles are getting scrapped by an equivalent of around 10%-15% of the number of vehicles placed on the market each year (as indicated by the stakeholder). This is the situation not taking account of the restriction. Under the restriction terms, more vehicles are expected to be disposed of as it may be a more cost-beneficial option than replacement of asbestos-containing parts. This would decrease the total fleet of vehicles by an assumed equivalent of 40%-60% of the numbers placed on the market each year (as indicated by the stakeholder). However, this Impact Assessment only considers the additional costs that would result because of the restriction, over and above the baseline. Therefore, the total fleet of vehicles would decrease by an equivalent of an additional 30%-45% of the numbers placed on the market per year. Given the uncertainty over the precise rate, the midpoint of this range has been used in the analysis as the best estimate.
- A81. The remaining fleet of vehicles (i.e. vehicles that are not going to be scrapped - 40%-60%) is assumed to undergo removal and replacement of asbestos-containing parts. Given the uncertainty over the precise rate, the mid point of 50% is used to provide the best estimate of costs.
- A82. A minimum cost estimate can be derived on the basis that all vehicles that are likely to be placed on the market are instead disposed of before the end of their service life (a 100% rate of scrappage). However, this is likely to be an unrealistic option: the economic value of many historic vehicles exceeds any costs associated with replacement of asbestos containing parts, and in addition owners derive significant intangible benefit from such vehicles. This has been confirmed by the stakeholder. Therefore, the minimum cost estimate is not calculated.
- A83. Based on the above assumptions, there are estimated to be around 380 vehicles that will be disposed of before the end of their service life<sup>54</sup> at a cost of £3,000 per vehicle (mid estimate of £2,000- £4,000 likely unit cost of disposal). This gives a total annual cost of disposal of around £ 1.1 million.
- A84. Accordingly, around 500 vehicles would remain (50% of the total 1,000 vehicles placed on the market per annum<sup>55</sup>), which would have their asbestos-containing parts replaced

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<sup>53</sup> Internal records indicate "Over the last 3 years the average rate of change of ownership has been 90/month which equates to 1080 per year"

<sup>54</sup> 1,000 annual turnover of vehicles times the mid estimate of the additional rate of disposing of, which is 38% (mid point of 30% and 45%)

<sup>55</sup> It is assumed that the same vehicle is not sold more than once per year.

at a unit cost of around £15,000 per vehicle, as discussed in paragraph A68. A maximum unit cost is being used as the age distribution of vehicles in the 500 vehicles estimate is not clear. This estimate therefore might be an overestimate, though we did not receive specific information through formal consultation on which to refine our assumptions. This gives a total annual cost of replacement of around £7.5 million.

- A85. Therefore, the total annual cost combining both early disposal and removal of asbestos content, which would result because of the restriction, is estimated to be around £8.7 million<sup>56</sup>.
- A86. The annual rate of vehicle turnover (1,000 vehicles placed on the market per year) is not expected to be static, since a proportion of buses would get scrapped each year. This means that the total fleet of buses would decrease each year by the number of vehicles scrapped. Therefore, it is reasonable to assume that the number of buses placed on the market each year would also decrease. This has been confirmed by the stakeholder; a cumulative 10% reduction of the annual turnover of 1,000 vehicles has been suggested and adopted for each year throughout the appraisal period. This means that in year 2 of the appraisal period only 900 buses would be placed on the market and affected by the restriction, in year 3, 800 buses would be placed on the market, and so on for the rest of the appraisal period. This assumption is uncertain, though no additional information was provided in response to the formal consultation on which to refine estimates.
- A87. Therefore, based on the above assumptions, the present value combining costs from both early disposal and removal of asbestos content over the 10 year appraisal period is estimated to be around £43 million (with a range of £39 million to £48 million using low and high assumptions, respectively). The choice of the 10 year appraisal period is explained in paragraph 23 (General Assumptions section).
- A88. Under Policy Option 2, this sector would be eligible for an exemption from the restriction. The costs presented would be avoided, meaning an expected best estimate of £43 million cost savings over the 10 year appraisal period (with a range of £39 million to £48 million using low and high assumptions, respectively).

#### *Avoiding cost of loss of historic vehicles and wider socio-economic effects*

- A89. Industry knowledge indicates ownership of vehicles in public and charitable sector museums is almost equally divided between three main categories – the museum itself, private individuals and others (companies, societies and other charities).
- A90. For a number of museums, storage costs for vehicles not currently on display are substantial. In order to avoid such high storage costs, vehicles are often leased to other museums for display. The restriction on leasing vehicles to other museums could result in a number of vehicles being disposed of as waste before reaching the end of their service life, so the owner can avoid unaffordable storage costs. There would be costs associated with disposal of the vehicles, but it is expected to be a cheaper option for the owners than the cost of keeping them.
- A91. If the vehicles are scrapped or not remediated to allow for placing on the market for wider viewing, there would be an associated intangible cost of loss of cultural heritage. It is difficult to quantify or place a monetary value on this.

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<sup>56</sup> Is slightly higher than the sum of the presented disposing of and replacement cost due to rounding.

## *Events*

- A92. Industry provided data indicating that there are currently some 500 events per year nationwide that involve the leasing of old buses, coaches, trams and trolleybuses. Events such as exhibitions and rides on old buses are estimated to attract around 1,000 people per event as indicated by the stakeholder.
- A93. There would be a loss of welfare and intangible value if the quality of the displays were affected by the restriction, with consumers less willing to attend and enjoy such events and exhibitions.
- A94. Events such as heritage vehicle exhibitions etc, generate substantial economic activity, including: expenditure on transport getting to and from an event and further spending on refreshments, in museum shops, or on entrance fees (if charged), etc. It is recognised that whilst some of this economic activity would simply be transferred elsewhere, there would nevertheless still be some associated loss of economic surplus. Again it has not been possible to quantify such losses.

## *Further considerations*

- A95. The Confederation of Passenger Transport has indicated that there are dozens of dealerships specialising in acquiring large numbers of redundant vehicles from operators and re-selling them both as public service vehicles (PSV) and for other uses – e.g. as promotional and exhibition vehicles. Working alongside the dealerships, there are also a number of specialised restorers in the UK who make their living from restoring and refurbishing such vehicles to sell on for a profit. The restriction would have serious consequence for such businesses and their ability to be competitive and relevant.
- A96. Owners of heritage vehicles frequently exchange them to refresh their collections and to maintain the interest and excitement for their target audience. This is indicated by the high turnover rates, and the impact of the restriction on this activity is disproportionately difficult to quantify.
- A97. The stakeholder has also indicated that a healthy export market has existed for many years of redundant British buses and coaches – particularly the traditional British double deck vehicle. Such activities fall within scope of placing on the market and are restricted under REACH – unless the vehicles have been remediated and the asbestos-content removed. In such cases, the costs associated with removing the asbestos content and replacing it with asbestos-free content may be passed on to the purchaser, substantially driving up the price of the vehicles perhaps to the detriment of the market.

## Annex 5

### Cars

#### *Baseline fleet of vehicles containing asbestos*

- A98. As with the other modes of road transport detailed above cars would have to have any asbestos-containing parts removed and potentially replaced with asbestos-free parts if the vehicles are to be placed on the market, i.e. when being sold, donated to a museum or loaned between museums, charitable organisations and individual enthusiasts.
- A99. According to research published by the Federation of British Historic Vehicle Clubs (FBHVC) in 2011<sup>57</sup>, around 70% of owners buy their cars privately. The restriction therefore mainly affects individual enthusiasts, who would have to bear the costs of replacement of asbestos-containing parts if they want to place their vehicle on the market. Alternatively individuals who want to purchase a vehicle may have to pay a higher price to cover the cost of the removal. The remaining 30% of vehicle sales in the preserved car market are assumed to be made by businesses (museums, charitable organisation, dealers, etc.). For the purposes of this Impact Assessment, it is assumed that 100% of all historic vehicles included in the FBHVC data include asbestos parts.
- A100. A stakeholder approached in this information gathering exercise (FBHVC) indicates that c.60,000 cars (covering the period from 1900s to 1980s, and thereafter referred to as 'historic') undergo a change of ownership on an annual basis, meaning they would fall into scope of the restriction under Policy Option 1. This is based on 5 previous years' data and is therefore considered to be a robust estimate.
- A101. The annual rate of ownership change is not expected to be static, since a proportion of cars would get scrapped each year, decreasing the total fleet of cars year by year. This would likely be exacerbated as a result of the restriction since commercial dealers would be less likely to engage in buying and selling cars if they had to have the asbestos content replaced, thereby reducing their ability to make profits on sales. An annual cumulative rate of decrease of 10% of the 60,000 annual change in ownership has been suggested by the stakeholder and adopted throughout the appraisal period, meaning that in year two only 54,000 cars would change hands, and so on over the appraisal period.
- A102. This is the figure that is used in the present analysis, rather than the total number of historic cars in the UK (which as indicated by the research is approximately half a million cars).
- A103. Historic cars are defined as those cars manufactured before the 1980s, so they are not necessarily valuable. The value of such cars might increase as a result of any reduction in supply, other things being equal. This would be likely to happen if such cars were being scrapped. There may also be corresponding impacts on the market for spare parts for such cars. However, it is not considered proportionate to estimate the size of these secondary effects for the purposes of this impact assessment.
- A104. For the purposes of the present analysis, the total stock of historic cars has been split into a number of groups according to the period when they were manufactured. This will allow a more accurate reflection of their different characteristics (with respect to scrappage and replacement of asbestos containing parts) and therefore the potential effect the restriction may have on them.

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<sup>57</sup> The British Historic Vehicle Movement 'A £4 Billion Hobby' research report published by the Federation of British Historic Vehicle Clubs in collaboration with The Historic Vehicle Research Institute, December 2011.



A105. An average unit disposal cost of around £250 has been adopted for all historic cars affected, based on stakeholder information (the stakeholder has contacted several dealers for a likely quotation for disposal of a historic car). This estimate nonetheless has a degree of uncertainty around it as it depends on the state of the scrap market and the value of spare parts. In the absence of additional information, it is assumed that car owners would have to pay to have the car safely disposed of (i.e. the costs of disposal will be greater than the value of scrap metal), as they have hazardous content.

A106. The FBHVC research (2009)<sup>58</sup> indicates that around 60% of historic vehicles were manufactured before 1960. A database analysis by the Heritage Vehicle Association indicates that 15% of historic vehicles were manufactured between 1960 and 1970, and 25% were manufactured between 1970 and 1980.

A107. For the purposes of this assessment, an assumption has been made that the percentage of pre-1960 cars that undergo a change of ownership each year is the same as for the entire fleet of historic cars (i.e. 60%). The same is true for 1960-70 and 1970-80 cars.

A108. The annual rate of vehicle turnover (the number of vehicles placed on the market per year) is not expected to be static, since a proportion of cars would be scrapped each year regardless of the restriction. This means that the total fleet of cars would be decreasing each year by the number of vehicles scrapped. Therefore, it is reasonable to assume that the number of cars placed on the market each year would also decrease. A cumulative 10% reduction of the annual turnover of vehicles placed on the market has been assumed.

#### *Pre-1960s cars*

A109. Due to the different manufacturing processes used in the past, there are understood to be no adequate substitute parts to meet the requirements of current safety standards, such that a 0% replacement rate of asbestos-containing parts for pre-1960s cars has been applied. This may lead to a substantial decline in the placing on the market of such cars.

A110. In the absence of an ability to place such cars on the market, private enthusiasts, who make up the largest group of historic car owners, are likely to try to keep their cars for as long as possible rather than scrap them, since they will continue to derive an intangible value from owning the vehicle. In accordance with advice from sector experts, there is therefore assumed to be only an additional 5% to 15% disposal rate, meaning that around 3,600<sup>59</sup> pre-1960 cars which would otherwise be placed on the market each year are being disposed of before the end of their service life. This assumption is uncertain, so 5% and 15% disposal rates have been used as low and high estimates respectively.

A111. This gives an estimated £0.9 million<sup>60</sup> cost of early disposal as a consequence of the restriction for pre-1960 cars in the first year of the appraisal period. The disposal costs are likely to occur in the first year of the appraisal period as non-private enthusiasts (i.e. dealers) will immediately be unable to place their vehicles on the market as a result of the restriction. Instead, it will be necessary to scrap them or incur storage and maintenance

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<sup>58</sup> The Historic Vehicle Movement in the United Kingdom 'Maintaining Our Transport Heritage' research report published by the Federation of British Historic Vehicle Clubs, 2009.

<sup>59</sup> 10% average rate of additional disposal times the total number of 36,000 pre-1960s cars being placed on the market per year

<sup>60</sup> 3,600 of pre-1960s cars being disposed of per year times £250 unit cost of disposal.

costs for vehicles which essentially hold no saleable value. This is true for all historic cars.

A112. As discussed in paragraph A108, the annual number of cars placed on the market (3,600) is likely to decrease by a cumulative 10% in subsequent years. Therefore, over the 10 year appraisal period, the present value of the disposal cost for pre-1960 cars is estimated to be around £4.5 million .

### *1960s cars*

A113. A unit cost of replacement of around £2,500 been assumed. This cost has been based on information provided by the stakeholder on the cost of new vehicle parts needed to replace the asbestos-containing parts.

A114. Sector experts have provided an assumption that all the gaskets would have been already replaced during any maintenance work carried out since 1970 as they are easiest to reach and replace.

A115. The cost of replacing some vehicle parts was not known to the stakeholder, so the previously used unit cost (£2,500) of materials was increased by 30% to account for uncosted parts. The full cost of material is around £3,200 per replacement of asbestos-containing parts in a vehicle (with £2,300 and £4,200 used as low and high estimates respectively to reflect uncertainty).

A116. As stated in paragraph A99, 70% of historic vehicles are thought to be owned privately. FBHVC research suggests the maintenance work (including replacement of asbestos-containing parts) on these vehicles is likely to be undertaken by their owners. For the remaining 30% the hire of professional workers has been assumed.

A117. A weighted average of the labour cost of replacement has been calculated at about £2,200 per car. It is based on £45/hour economic cost of time of a professional worker<sup>61</sup> and a £14/hour<sup>62</sup> opportunity cost of time of an individual carrying out replacement work in their own time. The number of hours needed to replace each part is based on the preserved buses information (see the table in paragraph A65).

A118. The full cost of replacing asbestos-containing parts of a car manufactured between 1960 and 1970 has been calculated at about £5,500<sup>63</sup> per car (£3,200 full cost of material plus £2,200 weighted cost of labour).

A119. It has been assumed that on top of the baseline the restriction will cause an additional rate of scrapping of c.40% out of the total of around 9,000 1960s cars that change hands annually. This is equal to around 3,400 cars. This has been based on the additional rate of disposal before the end of service life as used for preserved buses because we do not

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<sup>61</sup> This is based on information provided by the preserved buses stakeholder, which was felt to be applicable to the cars sector.

<sup>62</sup> In accordance with HM Treasury guidance (an average of a) out of work individual's effective return to labour of household activities (grossed up) and b) in work individual's mean gross hourly rate (grossed up)

<sup>63</sup> Is slightly higher due to previous rounding of parts of this cost.

have specific information on cars.<sup>64</sup> The remaining cars (around 60%, around 4,500 cars<sup>65</sup>) are assumed to undergo the replacement of asbestos-containing parts.

A120. Having applied the unit costs of disposal (£250), the cost of disposing of the 1960s cars is estimated to be around £0.8 million<sup>66</sup> in the first year of the appraisal period.

A121. Having applied the removal and replacement unit cost, the total cost of replacement is estimated to be around £25 million<sup>67</sup> in the first year of the appraisal period.

A122. The total cost of replacement and disposal of 1960s cars due to the restriction is therefore estimated to be around £26 million<sup>68</sup> in the first year of the appraisal period.

A123. As discussed in paragraph A108, the annual number of cars placed on the market each year (4,500 cars) is likely to decrease over time. Having applied the decreasing rate of 10%, the total cost of disposing of and replacing cars is estimated to be around £130 million over the 10 year appraisal period.

### *1970s cars*

A124. The stakeholder indicated that the cost of parts needed to replace asbestos-containing parts in such vehicles would be slightly cheaper for 1970s cars compared to cars from the previous decade. Therefore, we assume a unit cost of replacement of the asbestos-containing material that is 70% of the equivalent unit cost for 1960s cars, i.e. around £2,300 per car. The labour cost is assumed the same as for the 1960s cars (around £2,200), giving the full weighted unit cost of replacement of around £4,500 per car.

A125. The same assumption about the percentage of vehicle owners who, proposing to place their vehicle on the market, will opt for early disposal rather than removal and replacement of asbestos-containing parts is applied as for the 1960s cars (additional 40% rate of disposal and about 50% replacement rate (the remaining 10% are assumed to be scrapped anyway, regardless of the REACH restriction). This means 5,600 cars are placed on the market per year but then disposed of (40% disposal rate times 15,000 1970s cars placed on the market per year, as discussed in paragraph A106).

A126. This gives the estimated cost of disposal before the end of their service life for the 1970s cars of around £1.4 million<sup>69</sup> in the first year of the appraisal period.

A127. For the 1970s period 7,100 cars would be placed on the market and undergo asbestos removal and part replacement each year (15,000 1970s cars placed on the market each year times 50% replacement rate per year). The cost of replacement is estimated to be around £32 million<sup>70</sup> in the first year of the appraisal period.

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<sup>64</sup> It is possible that under the restriction case, a large number of vehicle owners would decide to hold onto their vehicles rather than incur the high asbestos removal / replacement costs required place them on the market. In this case, the total replacement costs stated here would be overestimated. However, there would still be significant costs in the form of the forgone consumer and producer surplus from the trade of the vehicle (i.e. the mutual gains from trade that are not realised).

<sup>65</sup> The remaining cars (about 1,000 per annum) are assumed to be scrapped anyway, regardless of the REACH Regulations.

<sup>66</sup> £250 unit cost of disposal times 1960-70s 3,400 cars being placed on the market per year and being disposed of

<sup>67</sup> £5,500 unit cost of replacement times 4,500 1960-70s cars being placed on the market per year and being replaced

<sup>68</sup> £25 million replacement cost plus £0.8 disposal cost per year

<sup>69</sup> 5,600 cars times £250 cost of disposal

<sup>70</sup> 1970s-1980s 7,100 cars that are placed on the market and undergo replacement per year times £4,500 cost of replacement per car.

A128. The total cost of replacement and early disposal of 1970s cars due to the restriction is therefore estimated to be around £33 million<sup>71</sup> in the first year of the appraisal period.

A129. As discussed in paragraph A108, the number of cars that change hands each year is likely to decrease over time. Having applied the decreasing rate of 10%, the total cost of the restriction requiring either the disposal of historic vehicles before the end of their service lives or the removal of their asbestos-containing parts is estimated to be around £170 million over the 10 year appraisal period.

#### *1980-1999 cars*

A130. It is understood that cars manufactured between 1980 and 1999 could potentially contain asbestos, particularly in the brake linings.

A131. It has not been possible to obtain data on the possible number of cars from this period that are being placed on the market, nor the estimated unit cost of replacing the asbestos parts. We are unable therefore to make any further analysis on this group of cars but expect that the restriction would have cost implications for this sector also.

#### *Total costs of disposing of and replacement for cars up to 1980*

A132. The total cost of the restriction associated with the historic cars over the period covering 1900 to 1980 is estimated to be around £60 million<sup>72</sup> in the first year of the appraisal period.

A133. As discussed in paragraph A108, a declining rate of change of ownership of 10% is assumed over the 10 years appraisal period.

A134. Having applied the declining rate, the total cost of the restriction in present value terms is therefore £300 million over the 10 year appraisal period. This translates to an equivalent annual value of around £35 million.

A135. These costs are total costs to society. As discussed in paragraph A99, 70% of historic vehicles are in private hands and 30% in business hands. It has not been possible to obtain data on the percentage of cars that are in private/business hands according to their age distribution. We have assumed that 70% of costs associated with the restriction would be borne by individuals and 30% by businesses.

A136. Given the number of assumptions, total estimated costs savings are subject to a large degree of uncertainty. To reflect this, low, high and best estimates are presented, based upon corresponding low, high and best estimates of assumptions. Total costs to businesses are expected to be around £90 million (30% of the total cost to society) in present value terms over the appraisal period (low estimate £60 million, high estimate £130 million). This translates to an equivalent annual value of around £10 million. Costs to individuals are therefore around £210 million (70% of the total cost to society) in present value terms over the 10 years appraisal period (low estimate £150 million, high estimate £290 million). The equivalent annual value is around £24 million.

A137. These costs would be avoided under Policy Option 2.

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<sup>71</sup> May be slightly lower due to rounding of the previous costs.

<sup>72</sup> £0.9 cost of disposal and replacement of pre-1960s cars plus £26 million cost of disposal and replacement of 1960-70s cars plus £33 million cost of disposal and replacement of 1970-80s cars. Amy not add up due to rounding.

*Avoiding cost of loss of historic vehicles and wider socio-economic effects*

- A138. As demonstrated by the projected turnover of vehicle ownership, the restriction will substantially undermine the movement of historic vehicles due to the high costs of replacing asbestos-containing parts. This in turn is expected to result in high numbers of historic cars being disposed of as waste before the end of their service life. This would have negative implications on preserving cultural heritage as well as undermining the economic activity associated with historic cars.
- A139. There are 150 transport museums in the UK, attracting 5 million visitors annually according to the research by FBHVC. It is disproportionate to estimate the effect the restriction could have on the operations of these museums and the corresponding visitor numbers but it can be expected to be negative.
- A140. According to research published by the Federation of British Historic Vehicle Clubs (FBHVC) in 2009 historic vehicle related activity is worth over £3 billion to the UK annually and export trade is worth over £300 million. If vehicle numbers are reduced as a consequence of the restriction on placing on the market, and if the export trade is limited, then this activity will diminish.
- A141. Further impacts would be felt by those who earn some or all of their living serving in the historic vehicle sector (over 27,000 people in the UK), and by the more than 2,500 businesses in the UK offering goods, services and products to the historic vehicle sector. It is disproportionate to estimate the precise effect the restriction would have on these sectors, but it could be expected that some people may lose their jobs and some companies and organisations may be forced out of business.
- A142. It would not be proportionate to attempt to quantify this effect as it is difficult to identify all the audience affected and even if identified, knowledge will be very uncertain about future effects on trade and export under the restriction.

## Annex 6

### *Case-study: acetylene cylinders*

- A143. The stakeholder contacted during the informal information gathering exercise accounts for about 70% of the acetylene cylinders industry. The estimates used in this case-study have been provided by the stakeholder.
- A144. According to the stakeholder, acetylene is a fuel gas used in a wide range of industries. Most is used with oxygen to produce a very high temperature flame. This very high temperature cannot be matched by the use of other fuel gases and thus it is indispensable for flame cutting of substantial steel components or for welding of steel. It has been a common, globally used industrial gas for a century. Other minor uses, apart from cutting and welding, exist in certain types of analytical processes.
- A145. Acetylene gas is transported in cylinders which contain asbestos. These cylinders are refilled with the gas around 4 times per year and are rented out to the users of the gas. This brings the cylinders into the scope of the restriction under the Policy Option 1 (Baseline).
- A146. Under the restriction, all asbestos would have to be removed and replaced with asbestos-free masses (which have been used in cylinders instead of asbestos from around 1990).
- A147. The stakeholder indicated that they have a total of around 140,000 to 175,000 cylinders containing asbestos in service. These would be subject to replacement under the restriction.
- A148. The unit cost of replacement with a new cylinder was estimated to be around £130<sup>73</sup> and the cost of disposal of asbestos around £13 per cylinder. There is also a cost of around £5 associated with the transport and labelling of the cylinder, since the manufacturer is based outside of the UK.
- A149. The stakeholder estimated that around 150 pallets would be needed to transport the cylinders at an average cost of £100 per pallet. The costs of replacing asbestos-containing cylinders are likely to be spread over 3 years as the manufacturer would not have the capacity to carry the procedure out in one year and also because of the associated disruption of services dependent on the availability of the cylinders. Therefore re-use is assumed in estimated cost of the pallets.
- A150. There would also be a one-off cost of around £84,000 of changing the supply hoses and the cylinder filling rigs. This is because the new cylinders will be a different size so the supply hoses and filling rigs will need to be changed both for the gas company and for the customer. Another one off cost would be training for the cylinder test personnel, which was indicated to be around £63,000.
- A151. All the costs have been provided by the stakeholder.

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<sup>73</sup> 150 Euros unit cost has been provided by the stakeholder and an exchange rate of 0.8398 has been used (Reuters, as on 27/01/2012.

<http://uk.reuters.com/business/currencies/quote?srcAmt=1.00&srcCurr=EUR&destAmt=&destCurr=GBP&historicalDate=>). This applies to all the costs presented in this section.

- A152. The total cost associated with the replacement of asbestos-containing acetylene cylinders is therefore estimated to be around £23 million (with a range of £20 million to £25 million using low and high assumptions respectively).
- A153. The estimated cost to the industry is likely to be around £33 million, based on extrapolating the known stakeholder data up to 100% (the stakeholder accounts for around 70% of the industry).
- A154. This cost is a one off cost that would be incurred over the first 3 years of the appraisal period. This is because of the capacity limitations of the cylinders supplier (it would not have the resource to carry out the necessary task in one year) and also because of the associated disruption of supply. It translates into a Net Present Value of around £32 million over the first 3 years of the appraisal period.
- A155. It is expected that the cost would be passed fully onto customers in increased product costs. This might lead to the end users reconsidering the use of acetylene cylinders and opting for a different gas if it was available. Although this would result in a decrease in demand and profits for the acetylene industry, there would be a corresponding increase in substitute markets, and the net effect to society is unclear.
- A156. In this case, estimated replacement costs above may represent an overestimate, as users would switch to alternative fuel sources where the cost of doing so is lower than the additional costs of acetylene cylinders (which in the case above have increased due to asbestos removal costs). An assessment of this response of users would require an estimation of the price elasticity of demand for acetylene gas cylinders, which is not considered proportionate for this analysis. In the absence of this additional analysis, the estimates presented above are considered a reasonable indication of the potential magnitude of costs.
- A157. If there was no sufficient substitute to the acetylene, the end users such as welders might reconsider the viability of their operations with the associated possible losses of profit and jobs.

#### *Other potential industries*

- A158. Historically industrial machinery has been made with asbestos-containing parts. These machines - which range from airplane engines to turbo-generators - have long service lives, and are particularly relevant to the defence and aerospace sectors. There was a significant export market but many also remain in service within the UK.
- A159. The manufacturers of turbogenerators (steam turbine electric generators used to generate electricity) estimate 80% of 462 machines known to contain asbestos are still in service. Specialist equipment is needed to repair and refurbish the machines to allow their service life to continue. This manufacturer anticipates receiving approximately 2 to 4 units per year into the United Kingdom for rework, with a total expected revenue for this work being about £1 million per annum. With the restriction in place, this activity is prohibited unless the asbestos content is removed and potentially replaced with asbestos-free content prior to the article being transferred in custody to the company for refurbishment.
- A160. Responses to the formal consultation also indicated that some agricultural machinery, such as tractors and trailers, is likely to contain asbestos (e.g. in brake linings),

A161. We consider that the sectors analysed in this impact assessment provide an indication of the potential magnitude of cost savings arising from the derogation. Therefore, in the interests of proportionality, we do not assess these additional industries further. If these were included, it is likely that total cost savings and net benefits from the proposal would be higher.



## Annex 7

### Museums

#### *Removal*

A162. The removal of asbestos content from an article can be extremely damaging in some cases, as it may destroy the structural and historical integrity of the article. In other cases, there may not be a suitable substitute allowing the article to be rendered complete or useful once the asbestos content has been removed.

A163. Museums are required by the National Heritage Act 1983 to “secure that the objects are exhibited to the public ..... that the objects are available to persons seeking to inspect them in connection with study or research”, and “to care for, preserve and add to the objects in (its) collections”<sup>74</sup>. Museums are therefore committed to ensuring that the items in their care are displayed, made accessible and stored in a safe and sustainable way, without compromising their physical, historical and technological integrity. The presence of asbestos in an article is not sufficient reason under the Act to destroy such articles.

#### *Management*

A164. Museums that are part of the National Museums of Science and Industry (NMSI) Group operate an assumptive asbestos policy, which assumes that articles will contain asbestos unless there is clear evidence to the contrary. Under this policy, there are standard operating procedures in place to ensure articles are managed accordingly and the risks assessed. There is a similar policy in place to make sure that loaned items with asbestos content are safely and appropriately managed.

A165. This policy means that museums in the NMSI Group apply a selective filter for acquisitions and loans and that any articles that match the selection criteria are considered of key importance to the museum’s mission.

#### *Indicative costs and benefits*

A166. Although in this Annex the cost savings which would result from Policy Option 2 are indicated for three individual museums, figures for the museums sector are not included in the total costs, benefits and net benefits set down in Table 1 of the main Evidence Base. This treatment is designed to avoid double counting with the figures included in Table 1 for the heritage transport sectors.

### Case-study: National Railway Museum (NRM) at York

#### *Background*

A167. NRM is the most visited museum in England outside of London. In 2007 an assessment was carried out on its impact on the economy of York, commissioned from the Yorkshire Tourist Board in 2007<sup>75</sup>. It concluded that annually:

- the NRM brought approximately 390,000 additional visitors into York;

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<sup>74</sup> National Heritage Act 1983, Chapter 47, Section 10, 1(c, d and a)

<sup>75</sup> Yorkshire Tourist Board, *An estimation of the National Railway Museum’s impact on the tourism economy of York*, November 2007

- the NRM generated approximately £32 million of additional expenditure in the city, 7% of which was spent in the museum, 93% in other businesses;
- the number of full-time equivalent jobs in the local economy supported by the visitor spend was about 690 of which 93% were outside the museum.

In 2010–2011 the NRM's York site welcomed 630,000 visitors, with 690,000 forecast to visit in 2011-2012.

### *Events*

A168. Objects that contain asbestos are particularly important to the National Railway Museum, because the rail vehicles are key attractions. Locomotives and rolling stock are regularly cited in visitor surveys as 'favourites'. For example, in 2010–2011, 69% of visitors saw the Duchess of Hamilton streamlining exhibition, which contains a small amount of encapsulated asbestos. 72% of visitors saw the royal trains exhibition; five of the seven vehicles in this display contain appropriately managed asbestos. 19% of visitors cited the royal trains as their favourite vehicles<sup>76</sup>.

### *Loans*

A169. Between 2005 and 2011, the NRM loaned out around 640 objects. About 60 of these, mainly rail vehicles, contained asbestos or are believed to contain asbestos sealed within their structures. Some of these loans involved vehicles visiting several venues, while others were renewals of existing loan agreements. NRM estimates that the cost for the total removal of asbestos from these objects is £3.1 million, or an average of £51,000 per vehicle.

A170. Using these estimates as the basis for projected outward loans over the next 10 years, we assume NRM will loan out about 10 vehicles containing asbestos per annum.<sup>77</sup> In order to comply with the restriction, this would involve an associated cost of £511,000 per annum over the 10-year appraisal period to remove the asbestos content from the vehicles to allow them to be placed on the market.<sup>78</sup>

A171. Over the same time period (2005-2011), the NRM borrowed 144 objects for exhibition. About 12 of these, all rail vehicles, contained asbestos or were believed to contain asbestos sealed within their structures. The estimated cost for the total removal of asbestos from these objects is £430,000, or an average of £36,000 per vehicle.

A172. Using these estimates as the basis for projected inward loans over the next 10 years, we assume NRM will borrow about two vehicles containing asbestos per annum.<sup>79</sup> In order to comply with the restriction, this would involve an associated cost of £72,000 per annum over the 10-year appraisal period to remove the asbestos content from the vehicles to allow them to be placed on the market.<sup>80</sup>

<sup>76</sup> 2010 – 2011 NRM Visitor exit survey

<sup>77</sup> Based upon 60 vehicles loaned out over the six year period 2005-2011. Of course, the costs of removing asbestos under the restriction in the base case may deter the museum from loaning objects, meaning that removal costs will be lower here. However, there would be significant additional costs from the forgone benefits in terms of profits and amenity benefits where items are no longer loaned for exhibition.

<sup>78</sup> Ten vehicles loaned per year multiplied by a £51,000 unit cost for removal of asbestos.

<sup>79</sup> Based upon 12 vehicles loaned out over the six year period 2005-2011.

<sup>80</sup> Two vehicles borrowed per year multiplied by a £36,000 unit cost of removal of asbestos.

## *Acquisitions*

A173. Over the six year period 2005-2011, the NRM acquired 4,382 objects, many of them archive items; 22 new acquisitions were identified as containing asbestos, or likely to contain asbestos. 16 of these were rail vehicles, some containing multiple occurrences of asbestos in a variety of forms. The estimated cost for completely removing asbestos from these vehicles or other artefacts is £685,000, or an average of £31,000 per vehicle.<sup>81</sup> Restrictions on acquisitions that contain asbestos, and the resulting high costs for removal, would inevitably result in the loss of important heritage assets.

A174. Using these estimates as the basis for projected acquisitions over the next 10 years, we assume NRM will purchase about four vehicles per annum that fall within scope of the restriction.<sup>82</sup> In order to comply with the restriction, this would involve an associated cost of £114,000 per annum over the appraisal period to remove the asbestos content from the vehicles to allow them to be placed on the market.

## *Impact upon collection*

A175. NRM have conducted a study of what it would cost to remove all asbestos content from their entire collection, so that every item is free from the REACH restriction. The cost of removal<sup>83</sup> of £11.4 million is more than five times the annual budget of £2 million which the NRM allocates to care, conservation and exhibition of the collection.<sup>84</sup> This is clearly a cost that could only be borne by severely impeding the Museum's mission and impacting on other financial demands.

## *Potential damage to collection*

A176. Asbestos removal specialists have no conservation experience, and although remedial conservation work might to some extent mitigate damage, reconstruction of objects would inevitably involve an unwelcome degree of unnecessary restoration or replacement of original structure. For some railway carriages in particular, asbestos removal would result in their virtual destruction. In some cases this might mean that there would be no longer be any point in retaining the original artefact or vehicle, and important objects could be lost forever. It is conceivable that the costs of this damage and loss of valuable heritage items would be considerably greater than the estimated asbestos removal or disposal costs.

## Case-study: The Science Museum in London

A177. Based on a recent audit, The Science Museum estimates that around 10% of its 240,000 article collection (excluding archives and library items: total collection is 350,000) contains asbestos.<sup>85</sup> This number (24,000 items containing asbestos) represents the

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<sup>81</sup> £685,000 total cost divided by twenty-two acquisitions containing asbestos

<sup>82</sup> Based upon 22 vehicles acquired over six year period 2005-2011.

<sup>83</sup> Removal of asbestos from a steam locomotive would entail complete dismantling, because lagging and gasket material are found throughout. This would require the removal of all cladding, the cab, boiler, firebox and major components such as the cylinders. The estimates for asbestos removal therefore include costs such as shunting, crane hire and the time taken for the museum's engineers to dismantle and then reassemble locomotives with due regard for their heritage status.

<sup>84</sup> Note that the estimate of £11.424 million is not derived from summing the removal costs of loans and acquisitions, as these are flows to and from the total collection. The estimate for removal asbestos from the museum's entire collection is provided to illustrate the potential magnitude of costs.

<sup>85</sup> This has been revised from an original estimate of 42% of articles containing asbestos, based upon a response by The Science Museum to the formal consultation. A recent audit undertaken by the Museum on their small object store (representing 80% of the total object collection) suggests that the likely proportion of all objects in the collections that will be found to have asbestos containing materials is 10% or less.

potential damage that could be caused to the museum's collections if such articles could no longer be placed on the market for preservation or loan.

A178. Approximately 10% of the total items housed are loans; of these 80% (19,200) are small articles and 20% (4800) are medium or large. Assuming that 10% of items in each size category contain asbestos, estimated costs for asbestos removal are as follows: £96,000 for smaller articles (1,920 containing asbestos at £50 removal cost per item); £120,000 for medium items (240 containing asbestos at £500 removal cost per item); and £2.16 million for larger items (240 containing asbestos at £9,000 removal cost per item).

A179. The estimated total cost of removal for asbestos content from these articles is £2.4 million.

A180. These costs are only for current loans: there would be comparable costs incurred to remove asbestos content from new acquisitions to get them to a standard suitable for placing on the market under the terms of the restriction. The costs of removing the asbestos mean The Science Museum may be unlikely to build its collection in the same way it has been able to do previously. This places an intangible cost on the UK for loss of social, cultural and technological heritage.

### Case-study: The Imperial War Museum (IWM) in London

#### *Background*

A181. IWM's mandate is to collect items relating to war and conflict. Many vehicles used in warfare will have asbestos in a range of places due to its fire resistant and insulating qualities. For example, most aircraft from 1950-80 have asbestos in and around all of the wiring.

#### *Loans*

A182. IWM loans vehicles and aircraft to other museums on a long term basis (this is more cost effective). They currently have 46 items out on loan, all of which contain asbestos. The loan agreements are renewed every 5-10 years and their return to IWM (or renewal) would be affected by the restriction.

#### *Sales*

A183. IWM are looking to rationalise their collection and are currently in the middle of a museum-wide review of their entire holdings. So far identified for 'disposal'<sup>86</sup> are 38 items that are known to contain asbestos.

#### *Removal*

A184. IWM surveys indicate that to remove 100% of the asbestos from the aircraft they have identified for placing on the market would require dismantling the entire aircraft. This could take 1-2 years for a team of four per object, at a cost of £200,000 per aircraft.

A185. The removal costs for vehicles would be comparable. The Museum has 20 aircraft and 33 vehicles that are immediately affected by the restriction. We estimate that the costs for removal would be spread over 2 years, with a best estimate cost of £5.3m per annum.

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<sup>86</sup> 'Disposal' used in this paragraph is a Museum term that covers a range of transactions involving removal of an object from its asset list.

A186. IWM have a further 31 engines that they estimate would cost £10,000 per article to strip of asbestos content, creating a total cost of £310,000 in year one.

A187. IWM's total budget is £10m per annum so this option would affect substantially upon their operational ability.