

# Periodic Review 2013

## Rail freight: conclusion on the average variable usage charge and a freight specific charge

January 2013



OFFICE OF RAIL REGULATION



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# Executive summary

## Overview

1. Reviewing the structure and level of track access charges paid by passenger and freight operators to Network Rail for use of the network is a core part of the 2013 periodic review (PR13)<sup>1</sup>.
2. In this document we set out our conclusions, following extensive discussion with stakeholders<sup>2</sup>, on two key aspects of Network Rail's track access charges for CP5 (i.e. 1 April 2014 – 31 March 2019): the level of an early cap on freight's average variable usage charge and the introduction of a new freight specific charge. We also set out how the decisions contained in this document fit with our longer term direction of travel, and immediate next steps.
3. While parts of this document are relevant to passenger rail travel, it is of particular importance to the freight sector. Rail freight has been a success story: it plays an important role in Great Britain's logistics and provides valuable environmental benefits. Its success has been assisted in the past both by financial support and by other decisions. We are keen that its success should continue and are confident that the decisions in this document will help promote it.

## An early cap on the average variable usage charge for freight

4. We are setting an early cap of £1.68 per 1000 gross tonne km (kgtkm) on the average variable usage charge that freight operators (FOCs) will pay in CP5<sup>3</sup>. The variable usage charge is the charge that train operators pay Network Rail to run vehicles on its track, principally reflecting the wear and tear they cause, and accounts for 70% of all track access charges paid by freight services.

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<sup>1</sup> PR13 will establish Network Rail's outputs and access charges for control period 5 (CP5), which will run from 1 April 2014 to 31 March 2019. PR13 also involves establishing the wider regulatory financial and incentive framework for CP5 that applies to Network Rail and train operators.

<sup>2</sup> Our consultation on the variable usage charge and on a freight-specific charge, published in May 2012, can be accessed at <http://www.rail-reg.gov.uk/pr13/consultations/freight-charges.php>

<sup>3</sup> This confirms the £1.68 per kgtkm proposed early cap, in 2011-12 prices and end-CP4 efficiency, on which we consulted in May 2012.

## Box 1: Summary of decisions in this document

It is for Network Rail to set its access charges, in accordance with the Railways Infrastructure (Access and Management) Regulations 2005. Our role is to set the framework within which they do this. The decisions we set out in this document provide early certainty to the rail freight industry on this framework, responding to their request, and allowing them to plan their businesses and therefore to compete more effectively with road. Specifically, we are:

- Confirming the cap on which we consulted for the average variable usage charge for freight services for CP5;
- Introducing a new freight specific charge, payable for the haulage of coal for the electricity supply industry (ESI), spent nuclear fuel, and iron ore;
- Delaying implementation of the freight specific charge to 1 April 2016 (for the first two years of CP5 the current charging structure, including the freight-only line charge, will apply). We have decided that Network Rail should phase in the charge over the last three years of CP5 on a gradual basis, for example with a profile of 20% of the full charge in 2016-17, 60% in 2017-18, and the full charge in 2018-19. Network Rail will consult on the profile, and calculate the charges within the cap we have set in accordance with the Railways Infrastructure (Access and Management Regulations) 2005, subject to our final audit and approval;
- Reducing uncertainty by setting the cap on the freight specific charge at the lower end of the range of our estimates for freight avoidable costs (specifically, for ESI coal we are capping the freight specific charge at slightly over £4 per 1000 gross tonne miles which is equivalent to £5 per net tonne km<sup>4</sup> – the lower of the three options tested by our consultants for our consultation, for spent nuclear fuel we are capping the charge at £11.64 per 1000 gross tonne miles, and for iron ore at £2.96 per 1000 gross tonne miles);
- We have decided to consult on whether and with what cap a freight specific charge should be levied on biomass as part of PR13, reflecting the views of potential investors that we should not delay our decision on biomass until PR18. We will consult early in 2013 on levying the charge on biomass on an equivalent basis to that for ESI coal; and
- We have decided not to pursue geographic disaggregation of the variable usage charges, reflecting concerns raised by the industry about the complexity this could introduce and the extent to which this would undermine rail freight's ability to compete with road.

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<sup>4</sup> The conversion factors are as follows: £4 per thousand gross tonne miles = £5 per thousand net tonne km x {1.6 km per mile} / {2 gross tonnes of ESI coal per net tonne}

5. Regulators in other sectors do not typically give such early certainty and it is difficult to do so at this stage because we do not yet know what Network Rail will deliver in CP5 and what its efficient costs of delivery will be – this will become apparent through our assessment of Network Rail’s Strategic Business Plan. Nevertheless, we have listened to and understand the arguments put to us by the freight sector, and we are providing this early certainty in order to allow it to better plan its business in competition with road haulage.

6. Our £1.68 early cap represents an increase of 7.5% on the average variable usage charge that freight is paying in CP4 plus a 15% confidence interval (a 23% increase combined). But it is important to note that the final level of freight average variable usage charge, which we will set out in our PR13 final determination in October 2013, will be lower than £1.68. This is both because we have allowed a margin of error of 15%, above which we are confident the costs will not increase (the cap), and because we have not yet undergone the process of challenging Network Rail’s costs and setting it a target for the efficiencies it will need to achieve in CP5. The next step in this process is beginning now that we have received the company’s Strategic Business Plan, and we will set out our draft determination for consultation in June 2013, concluding with our final determination in October 2013. In CP4, we set Network Rail the challenge of becoming 21% more efficient and allowed freight operators to benefit from long term efficiency targets so that charges were overall 35% below those for the previous control period. We do not yet know what our CP5 efficiency challenge to the company will be, but applying the same challenge for purely illustrative purposes to the estimated average freight VUC charge of £1.46 per kgtkm<sup>5</sup>, would give a final freight average variable usage charge of £1.14 per kgtkm, which is very similar to the current equivalent charge of £1.15 per kgtkm.

7. In our May 2012 consultation we consulted on capping average variable usage charges for passenger and freight services combined for CP5 at a level of £1.79 per kgtkm. Unlike the freight operators, passenger operators have not been subject to consultation on a new charge (the freight specific charge), and the vast majority of passenger train operators are held neutral to changes in Network Rail’s charges at a periodic review through their franchise contracts with the Department for Transport and (in the case of ScotRail) Transport Scotland. We do not therefore see the same value in providing early certainty on passenger average variable usage charges and have not set out any decision on an early cap for these charges in this document. We will consult on our approved version of Network Rail’s price lists for track access charges as part of our draft determination in June 2013, and will conclude in our PR13 final determination in October 2013.

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<sup>5</sup> The cap we have set is this value plus 15% uncertainty band.

## Introduction of a new ‘freight specific charge’

8. We have decided to introduce a new charge in CP5 – a ‘freight specific charge’ – for freight services carrying ESI coal, spent nuclear fuel and iron ore.

9. In CP4 Network Rail receives an average of £4bn a year from network grants, in addition to the £2.3bn a year it receives from passenger and freight operators and other sources (such as property revenue). Now more than ever it is vital that everyone plays their part in maximising the value for money that users and taxpayers get for their contribution to the rail industry. We are keen to improve the extent to which the charges that Network Rail’s customers pay reflect the costs they impose on the network. More cost reflective prices help to drive cost savings and send better signals to Network Rail and its customers for the efficient provision and use of access to the network, which is itself a scarce resource. More cost reflective charges also improve transparency – making it clearer who pays for what and what they receive in return. In our view, the freight specific charge is an important step in improving value for money.

**Table 1: Freight and passenger track access charges revenue (2011-12)**

Charge	Freight (£m)	Passenger (£m)	Network Grant
Variable usage charge	42	150	
Traction electricity charge	5	200	
Capacity charge	4	169	
Other charges	6	9	
Fixed charge	0	887	
Freight-only charge	6	0	
<b>Total</b>	<b>63 (4%)</b>	<b>1,415 (96%)</b>	<b>3,989</b>

10. A substantial proportion of the public financial support for the rail industry benefits rail freight. All train operators pay a variable usage charge for each vehicle they run on the network. But only franchised passenger train operators pay a fixed charge, which contributes to infrastructure costs beyond the costs generated simply by running additional vehicles. In 2011-12 passenger train operators paid £887m to Network Rail in fixed charge, 14% of the company’s total revenue. Over time we are keen to see network grant fall and the level of charges that passenger train operators pay directly increase, with passenger operators more exposed to changes in Network Rail’s costs to improve their incentives to work with Network Rail to delivery efficiencies<sup>6</sup>. The comparable charge that freight operators pay (the freight-only

<sup>6</sup> We note this in our letter of 19 December 2012 concerning franchising: <http://www.rail-reg.gov.uk/upload/pdf/brown-review-franchising.pdf>

line charge) amounted to around £6m in 2011-12. On the basis of the calculations in this document, freight contributes currently only 21-28% to those infrastructure costs it generates by running trains on the network.

11. There are good reasons to subsidise rail freight. This is because there are wider economic and social benefits of moving freight by rail rather than road. Without rail freight, there would have been an additional 6.7 million road journeys in 2007-8. Switching from road to rail reduces CO<sub>2</sub> emissions by 70% per tonne moved and generates benefits in terms of reduced road congestion equivalent to 28 pence per HGV mile avoided. This is why the UK and Scottish governments have consistently supported rail freight, and have funded substantial investments to improve rail freight infrastructure - for example gauge enhancements on the Felixstowe to Nuneaton and Southampton to the West Midlands to allow large containers to be carried by intermodal traffic and the Grangemouth branch improvement.

12. But the wider economic and social benefits that underlie the subsidy to rail freight are generated principally when freight that would otherwise have travelled by road travels by rail. To date, rail freight has benefitted from subsidy, even where, as is the case for ESI coal, spent nuclear fuel and iron ore, it cannot easily or economically switch to road. By introducing a freight specific charge for these commodities, we will increase the extent to which they contribute to the costs that freight imposes on the rail network. And in doing so, we will reduce the overall size of the subsidy that Network Rail receives (through grant directly from government) and the fixed charges paid by passenger train operators.

13. Network Rail has provided estimates of the costs that freight imposes on the network ('freight avoidable costs') and these has been reviewed by Arup, an expert reporter. Having listened to the views of the industry and its customers during our consultation, we have taken a conservative view and set a cap at our estimate of the low end of the range (£278m a year).

14. In order to address concerns raised during our extensive stakeholder engagement, we have decided it is appropriate that Network Rail phase these charges in gradually over the last three years of CP5 to allow businesses time to adapt. The exact level of the charge may change as Network Rail refines its estimate of the costs that rail freight generates on the network. But we are now setting a cap on the level of the full charge for each of these commodities, although Network Rail will consult on profile of the phasing. The level of the charge will be zero in the first two years of CP5 (2014-15, 2015-16), rising gradually to the full level by the end of CP5 (2018-9). Table 2 shows the level of the cap for each commodity in each year of CP5, assuming a gradual introduction of 20% of the charge in year 3, 60% in year 4 and 100% in year 5.



**Table 2: Freight specific charge cap (per kgm, 2011-12 prices) and profile through CP5**

	Current track access charges*	Freight specific charge cap, 2014-15	Freight specific charge cap, 2015-16	Freight specific charge cap, 2016-17	Freight specific charge cap, 2017-18	Freight specific charge cap, 2018-19
ESI coal	£2.83	£0.00	£0.00	£0.80	£2.40	£4.04
Spent nuclear fuel	£9.83	£0.00	£0.00	£2.15	£6.98	£11.64
Iron Ore	£2.28	£0.00	£0.00	£0.59	£1.77	£2.96

\* We show the current charges (variable usage charge, capacity charge, coal spillage charge, freight-only line charge) to allow comparison. The freight specific charge would be additional to these charges. Source: ORR and MDST analysis of price lists and revenue data.

15. The introduction of this charge will see rail freight pay a greater contribution to the costs that it imposes on the network. The proportion of Network Rail's costs that the freight sector will pay as a result of freight specific charges at these levels will clearly depend on our view in PR13 on Network Rail's costs, and on levels for VUC, fixed charges and network grant. But if the freight sector were to pay the full level of these charges it would make a contribution of around 30-35% to the costs it generated in running trains on the network.

16. In response to our May 2012 consultation we received many submissions, in particular from those likely to be affected by our proposal to introduce a freight specific charge. We have listened to, understood and taken seriously these concerns. In the light of these submissions, the conclusions set out above differ materially from the proposals on which we consulted in May 2012, specifically:

(a) We have taken a conservative approach in estimating the costs that freight imposes on the network ('freight avoidable costs') and which we seek to recover through the freight specific charge. We consulted on an indicative freight specific charge (over and above the existing freight-only line charge) for ESI coal of £8 per kgm<sup>7</sup>, with other commodities being charged on an equivalent basis. We have now capped the charge, net of the freight-only line charge, at £4.04 per kgm, £11.64 per kgm and £2.96 per kgm for ESI coal, spent nuclear fuel and iron ore respectively;

<sup>7</sup> This is equivalent to £10 per 1000 net tonne km above variable charges and the freight only line charge, as tested as a central option by our consultants NERA and MDS Transmodal.

(b) We have decided not to introduce the freight specific charge for any of three market segments until year 3 of CP5, i.e. 2016-17<sup>8</sup>. This will give the affected businesses time to adapt to the charge. In particular it will give the ESI coal industry greater scope to adapt at a time of particular change and uncertainty (for example due to the coming into force of the Industrial Emissions Directive (IED) Directive<sup>9</sup> in 2016 and increasing use of renewables); and

(c) We have decided to phase the freight specific charge in gradually, for example at 20% of its final level in 2016-17, 60% in 2017-18 and 100% in 2018-19 (producing the charges as set out in Table 2). Again, this will give the affected businesses time to prepare for and adapt to its full impact.

17. The final level of charge is ultimately for Network Rail to set, subject to the caps set by us and our audit and approval of the mark-up, in line with Directive 2001/14 and the Railway Infrastructure (Access and Management) Regulations 2005. In doing this, Network Rail will consult on the exact levels of the charge in each year of CP5, taking into account our decision on phasing.

18. We estimate that – if passed on – the freight specific charge for ESI coal at its maximum level will generate an increase in the transport costs of around 8% to 15% for an average length journey. Taking into account our decision on phasing, we estimate that the average impact of the charge on the price a customer will pay for a typical ESI coal haul will be an increase in the region of 5%.

19. Similarly, we estimate that – if passed on – the freight specific charge for spent nuclear fuel will generate an increase in the prices paid by the freight operators' customers for spent nuclear fuel haulage of an amount equivalent to 11% overall. And, taking into account our decision on phasing, we estimate that the average impact of the charge on the price a customer will pay for a typical haul of spent nuclear fuel will be an increase in the region of 4%.

20. Again similarly, we estimate that – if passed on – the freight specific charge for iron ore will generate an increase in the prices paid by the freight operators' customers for iron ore haulage of an amount equivalent to 9% overall. And, taking into account our decision on phasing, we estimate that the average impact of the charge on the price a customer will pay for a typical haul of iron ore will be an increase in the region of 3%.

21. We have also decided to consult on introducing a freight specific charge for the haulage of biomass as part of PR13, for CP5. This represents a change in position from our May 2012 consultation document, in which we proposed to make a decision on a freight specific charge for biomass in PR18. We had proposed this on the basis that the market for biomass was emerging, and that it was not yet clear what the market could bear. Consultation respondents told us clearly that they would prefer to know in PR13 whether we

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<sup>8</sup> The freight-only line charge will continue to apply for each year of CP5 on the same basis as that for CP4, and we confirm that we are content with the approach the Network Rail consulted on and concluded on, in March 2012, in this document.

<sup>9</sup> 2010/75/EU

would introduce a freight specific charge for biomass, not least as this would provide greater certainty for their forthcoming investment decisions. We agree with this. We will therefore be consulting shortly on a proposed freight specific charge for biomass, with a view to setting out our provisional view as part of our draft determination in June 2013 and the level of the charge as part of the final determination in October 2013.

22. The charges that we will introduce for the haulage of ESI coal, spent nuclear fuel, and iron ore and propose to introduce for biomass, as set out above, reflect the fact that these commodities cannot easily or economically travel by road. Our detailed analysis shows that the introduction of the freight specific charge, phased in as set out above, will not generate a material shift of rail freight to road. Our decision is therefore in line with EU Directive 2001/14, which requires infrastructure costs to be recovered according to their ability to bear higher charges, reflecting among other things the extent to which rail competes with road. Reflecting the greater substitutability of road for rail haulage in respect of other services, we do not plan to levy any such charge on other rail freight services.

## Longer term direction of travel

23. As noted above, rail freight plays a crucially important role in Britain's economy. It has seen tremendous growth since privatisation, performance has improved and freight customer satisfaction has risen. We have played an important role in this success story – independent regulation has provided certainty and stability for the industry and our efficiency challenge to Network Rail has seen freight charges come down, for example by 35% between CP3 and CP4. Our incentives and interventions have improved freight performance, for example through our monitoring of the possessions disruption index and requirement on Network Rail to set up a freight recovery board where performance was poor. From this solid base, the operators themselves have improved efficiency and customer service to grow their businesses. We want to see the freight success story continue into the future. And we expect that it will do so, in part through the efforts of the sector itself to reduce costs and improve customer service and in part through continued support from the UK and Scottish Governments, recognising the wider benefits it brings. We note that in CP5 the Department for Transport has announced funding of £200m for Strategic Rail Freight Network and Transport Scotland £30m for the Scottish Strategic Rail Freight Investment Fund (CP5)<sup>10</sup>.

24. As noted above, given the amount of public financial support for the rail industry, in addition to the contribution from its users, we need to do what we can to improve value for money in the industry. We see more cost reflective charges as a key element in this. We are keen to improve the extent to which the

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<sup>10</sup> The Strategic Rail Freight Network is a fund that the Department for Transport has created for use in CP5 to enable freight to make best use of the existing network and, by increasing the network's freight capability leverage continued private sector investment in rail freight growth. The Scottish Strategic Rail Freight Investment Fund (CP5) is a fund that Transport Scotland has created for use in CP5 to encourage growth in rail freight and reduce emissions. The Fund should support sustainable transport for freight, thereby reducing the supply chain's transport emissions and reducing road congestion.

charges that Network Rail's customers pay reflect the costs they impose on the network. More cost reflective prices help to drive cost savings and send better signals to Network Rail and its customers for the efficient provision and use of access to the network, which is itself a scarce resource. More cost reflective charges also improve transparency – making it clearer who pays for what and what they receive in return. The decisions we have set out above constitute an important step towards more cost reflective charges, as they will result in some freight operators (and their customers) paying a greater share of the costs they generate in using the rail network. It should therefore over time improve efficiency and the fairness of cost recovery.

25. Through our PR13 consultations we have discussed with many of our stakeholders the possibility of our undertaking further work to look at the structure of Network Rail's charges, with a view to improving their cost-reflectivity and overall efficiency. Many of our industry stakeholders have expressed a willingness to work with us in doing further work on this in the early part of CP5, with a view to introducing any resulting changes in CP6. We look forward to working with the industry on this, in particular through the Rail Delivery Group, over the next two years.

## **Next steps**

26. We have confirmed Network Rail's proposed early cap on the average variable usage charge for freight. Before we audit and approve the final levels of the variable usage charge (for freight and passenger) we must review Network Rail's Strategic Business Plan and assess the efficiency of the scope and cost of the work Network Rail plans to do in CP5. We will set out our provisional view on the final level of these charges in our draft determination in June 2013, and our final view in our final determination in October 2013.

27. We have asked Network Rail, in advance of our draft determination in June 2013 to refine its estimates of those costs (freight avoidable costs) that the freight specific charge will recover. The eventual charges will not be higher than the caps set out above, but refinement of these costs could mean the final charges are lower.

28. Our early cap gives the freight sector the certainty it has asked for, and our phased approach to the freight specific charge allows it to plan ahead and adjust to a new and fairer structure of charges in future. We look forward to working with the industry over the first two years of CP5 to explore possible changes to the structure of Network Rail's charges to improve their efficiency and cost reflectivity, with possible implementation in CP6, and to deliver the investment from which rail freight will benefit, securing its continued success.

# 1. Introduction

## Purpose of this document

1.1 Reviewing the structure and level of track access charges paid by passenger and freight operators to Network Rail for use of the network is a core part of the 2013 periodic review (PR13)<sup>11</sup>.

1.2 In this document we set out our conclusions, following extensive discussion with stakeholders<sup>12</sup>, on two key aspects of Network Rail's track access charges for CP5 (i.e. 1 April 2014 – 31 March 2019): the level of an early cap on freight's average variable usage charge and the introduction of a new freight specific charge. These decisions are of particular importance to freight operators, their customers and other parts of the freight haulage supply chain but they also affect the wider rail industry including Network Rail and passenger operators.

1.3 We also set out how the decisions contained in this document fit with our longer term direction of travel, and immediate next steps. We are confirming that we are going to work with the industry to explore the scope for and desirability of a wider package of changes to the structure of charges, including potential geographic disaggregation of the variable usage charge, but that these changes would be implemented as part of the 2018 periodic review for CP6 which starts in April 2019.

1.4 We are also using this document to cross refer to Network Rail's work calculating track access charges and confirm certain conclusions it has made.

## The importance of rail freight

1.5 Rail freight plays an important role in Great Britain's logistics and makes a significant contribution to the economy. Around 25% of electricity consumed in the UK is generated by coal that has been moved by rail. A further 16% is generated by nuclear power, with spent nuclear fuel being moved by rail for disposal. Rail moves aggregates and cement into major conurbations. For example, in London more than 40% of these

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<sup>11</sup> PR13 will establish Network Rail's outputs and access charges for control period 5 (CP5), which will run from 1 April 2014 to 31 March 2019. PR13 also involves establishing the wider regulatory financial and incentive framework for CP5 that applies to Network Rail and train operators.

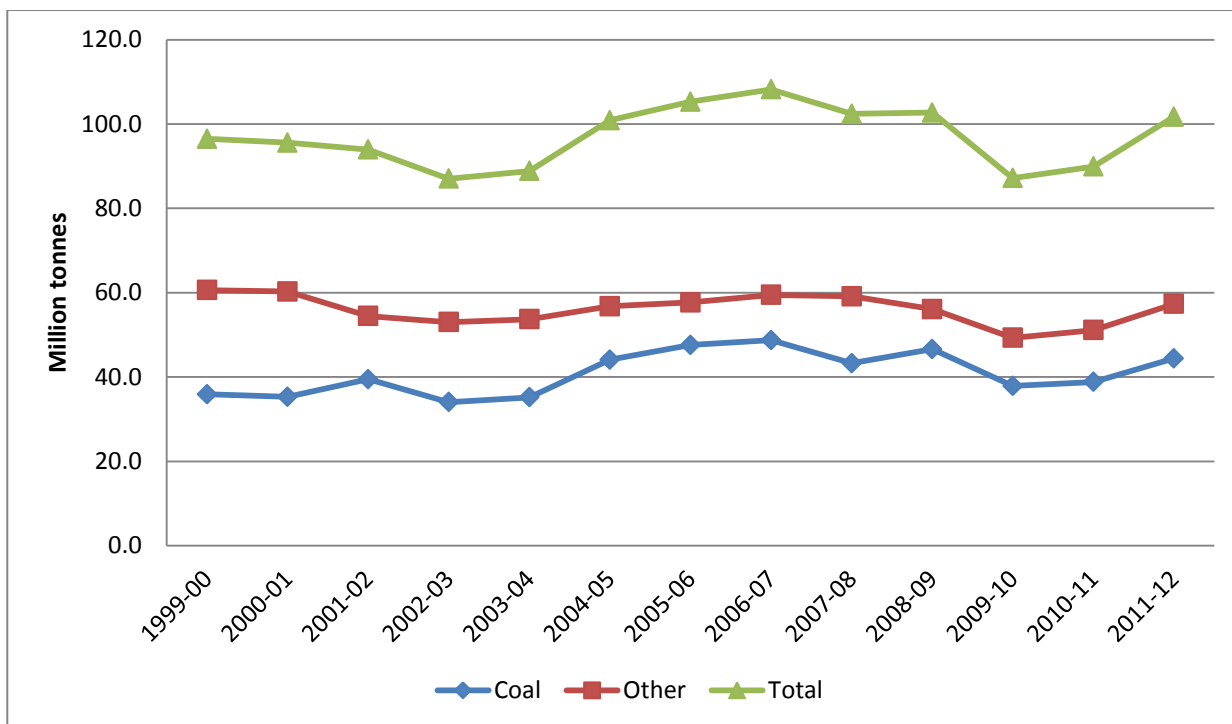
<sup>12</sup> Our consultation on the variable usage charge and on a freight-specific charge, published in May 2012, can be accessed at <http://www.rail-reg.gov.uk/pr13/consultations/freight-charges.php>

are delivered by rail. Overall, 28% of deep sea containers that arrive or depart from the major ports are transported by rail.

1.6 Moreover, rail freight has wider benefits for the economy and society. According to the VfM study<sup>13</sup>, without rail freight there would have been an additional 6.7m road journeys in 2007-08. Therefore, freight has a critical role in helping to reduce the economic costs associated with congestion. For example, switching from HGV to rail on average generates benefits in terms of road decongestion worth on average 28 pence per HGV mile or more. Moreover, such a switch saves 70% of the CO<sub>2</sub> emissions that would have been generated if the freight had gone by road.

Freight traffic is a relatively small part of the total traffic on the railway. Rail freight accounts for 7% of the train km on the GB network, but 25-30% of the tonne km. It operates commercially, competes with other transport modes, particularly road haulage, and only receives limited grant support from government directed at achieving modal shift from road to rail.

**Figure 1.1 Freight lifted in Great Britain, 1999-00 to 2011-12**



Source: ORR data portal/National Rail Trends

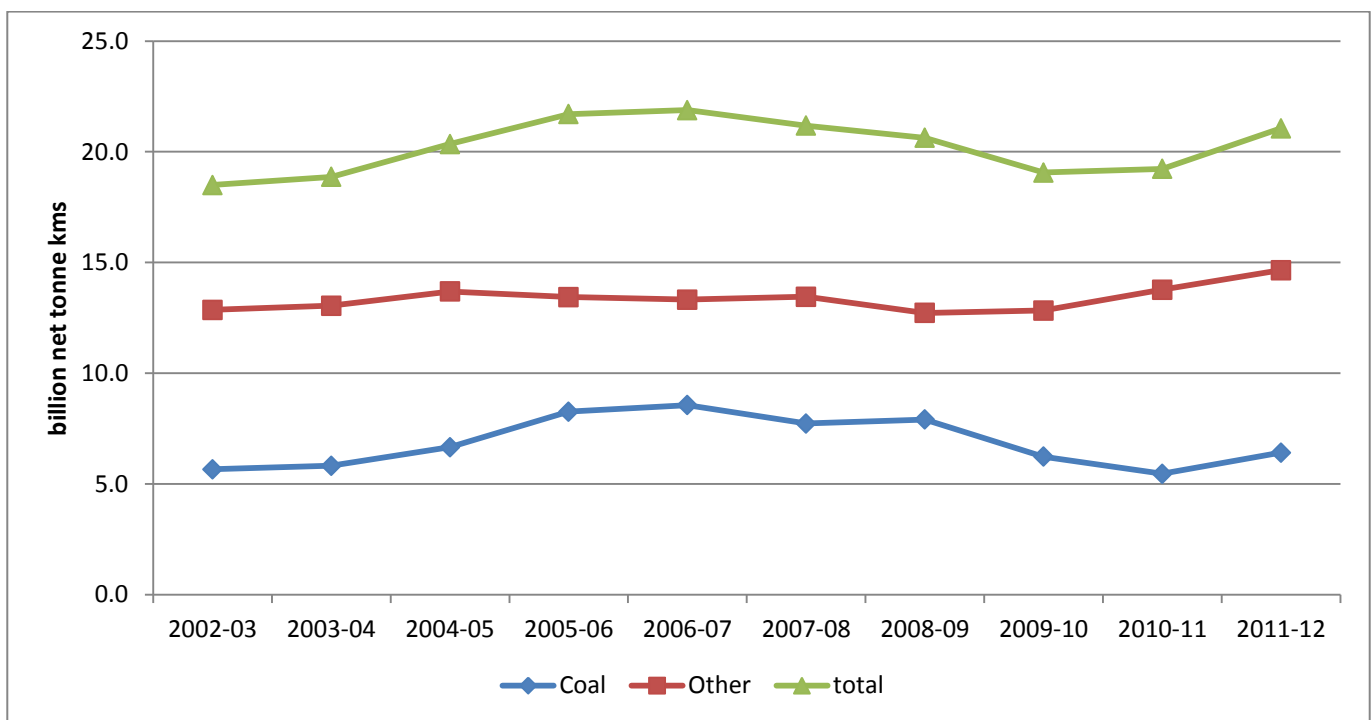
1.7 The recent record of the industry is impressive at a time of recession. Figure 1.1 shows the levels of freight lifted since the late 1990s. The data show that freight lifted reached a peak of 108.2 million tonnes in 2006-07 following four years of continuous growth. 2009-10 and 2010-11 saw the volume of freight lifted

<sup>13</sup>Realizing the Potential of GB Rail: Full Independent Report of the Value for Money Study, May 2011: <http://www.rail-reg.gov.uk/server/show/ConWebDoc.10401>

dip back down to 2002-03 and 2003-04 levels but it recovered in 2011-12. The volume of coal<sup>14</sup> lifted fell 19% between 2008-09 and 2009-10, but it has recovered recently. In December 2012, National Rail Trends published the latest data on total freight lifted<sup>15</sup>. Freight lifted in 2012-13 Q2 was 27.7 million tonnes, 9.4% higher than 2011-12 Q2 and the highest Q2 figure since the time series began.

1.8 Figure 1.2 shows an upward trend in the levels of freight moved<sup>16</sup> since 2002-03. The amount of freight moved peaked during 2006-07 at 21.88 billion net tonne kilometres moved but fell to 19.06 billion net tonne kilometres by 2009-10. In 2011-12 it recovered to 21.06 billion net tonne kilometres. The total amount of freight moved in that year was 9.5% more than 2010-11 and the highest total since 2007-08.

**Figure 1.2 Freight moved in Great Britain, 2002-03 to 2011-12**



Source: ORR data portal/National Rail Trends

## Promoting rail freight

1.9 This success is, in large part, due to the combined efforts of freight operators and government with support from ORR. Since privatisation rail freight operators have achieved significant improvements in

<sup>14</sup> This refers to both Electricity Supply Industry (ESI) coal and non-ESI coal.

<sup>15</sup> <http://www.rail-reg.gov.uk/server/show/nav.1527>

<sup>16</sup> Freight moved is measured in net tonne kilometres (NTKm). This takes into account the net weight (excluding the weight of the locomotive and wagons) of the goods carried (the freight lifted, measured in tonnes) and the distance carried.

productivity. In their Manifesto for Rail Freight Growth<sup>17</sup>, the Rail Freight Operators' Association and the Rail Freight Group (RFG) stated that: "Over the last 14 years rail freight operators have invested heavily in new equipment with low maintenance costs, reducing the assets they employ. Rail freight growth of 60% has been achieved using only half the locomotives and two-thirds of the wagons employed in the mid-nineties." The rail freight industry has also invested over £1.5 billion in the network since 1995.

1.10 Over the current control period (CP4) rail freight has benefited from a significant programme of freight specific enhancement schemes funded by government. The majority of these have been to support the development of a Strategic Freight Network, a network of trunk routes with sufficient capacity and appropriate gauge to carry expected freight flows. The UK Government has committed over £200m to support this programme which includes, for example, gauge enhancement on the Felixstowe to Nuneaton and Southampton to the West Midlands to allow for larger containers to be carried by intermodal traffic.

1.11 Freight has also benefited in CP4 from the 7 day railway fund, established at the last periodic review to reduce the level of disruption caused by engineering works as well as from schemes not directly aimed at freight enhancements. Schemes to increase capacity on the East Coast Mainline for passenger services, for example, have also increased capacity for coal traffic between Immingham and the Aire Valley and also the availability of diversionary routes.

1.12 In the previous periodic review, ORR determined freight track access charges for CP4 that were overall 35% below those for the previous control period. In addition, through our Efficiency Benefit Sharing Mechanism (EBSM), at the end of November 2012, the Scottish freight sector received a £4.75m payment as a result of having helped Network Rail to improve its efficiency over the period April 2009 to March 2012. Similarly, the sector in England and Wales received £0.63m. The EBSM will continue to operate for the remainder of CP4, with a comparable mechanism (REBS) applying in CP5<sup>18</sup>.

1.13 For CP5, the HLOS/SoFA for England and Wales contains £200m of funding for the Strategic Freight Network. In addition freight will benefit from other HLOS investment. For example, some proportion of the East Coast fund and electric spine investment will benefit freight (e.g. for electric traction). The HLOS/SoFA in Scotland contains a freight investment fund of £30m. Freight will also benefit from the other investment projects such as the Highland main line.

## Moving forward

1.14 There remains a strong case for subsidising rail freight through lower track access charges and taxpayer funded enhancements because of the wider economic and environmental benefits it delivers by

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<sup>17</sup> [www.rail.dbschenker.co.uk/manifesto/4strategicnetwork.pdf](http://www.rail.dbschenker.co.uk/manifesto/4strategicnetwork.pdf)

<sup>18</sup> [Aligning incentives: decisions on route-level efficiency benefit sharing \(REBS\) and train operator exposure to Network Rail's costs at a periodic review, ORR December 2012.](#)



taking traffic off the roads. It is this rationale that underpins the continuation of support from the UK and Scottish Governments and ORR into CP5 but this rationale has less relevance to rail freight markets that do not compete directly with road because subsidy to these markets does not generate modal shift and does not deliver the wider economic and environmental benefits associated with it.

1.15 Since rail privatisation the structure of track access charges has always reflected this. Rail freight traffic that does not compete directly with road has paid a greater contribution to Network Rail's costs – currently this takes the form of the “freight-only line charge”, amounting to revenue of around £6 million a year - but the costs associated specifically with rail freight far exceed the revenues that are generated through the charges it pays. In 2011-12 passenger train operators paid £887m to Network Rail in fixed charges, 14% of the company's total revenue. And even noting that franchised passenger operators effectively pass the fixed charge on to the taxpayer, it is significant that, on the basis of the best available evidence, freight appears to contribute only 21-28% to those infrastructure costs it generates by running trains on the network.

1.16 In May we consulted on revised estimates of the variable usage charge, which were higher than those applied in CP4, and on levying an additional freight specific charge (FSC). As proposed the FSC would be implemented only in those segments of the freight market where demand is inelastic or competition with road is less intense. We consulted on a framework for developing this charge based on estimating freight avoidable costs (FACs), being the costs that would not be incurred by Network Rail if freight services were no longer to use the network, and allocating them to commodities.

1.17 We received a strong response to this consultation from the industry which raised concerns about the impact that our proposals would have on the business case for freight and on individual participants. Respondents were also concerned about the timing of our decisions on these matters citing a need for certainty so that business planning could be undertaken on a robust basis. Our policy has developed in light of the points made by consultees.

1.18 On timing we are taking the unusual step of giving early certainty on the maximum level of charges. In this document we set caps on both the variable usage charge and FSC. There is further work to do which will impact the charges themselves but the certainty we are able to give is that the charges will not exceed the caps set out in this document. In this way we are providing a firm basis on which the freight operators and their customers can plan.

1.19 We also recognise the importance of rail freight and the wider social and environmental benefits of transport of commercial goods by rail. But subsidy of rail freight does of course have to be balanced against delivering maximum value for money from public expenditure and the benefits of cost reflective charging, which would see charges based on the cost industry sectors imposes on the network, bring

greater transparency to costs and the use of subsidy and provide incentives for industry participants to work together to improve efficiency.

1.20 To date, rail freight has benefitted from subsidy, even where, as is the case for ESI coal, spent nuclear fuel and iron ore, it cannot easily or economically switch to road. This does not represent value for money for the taxpayer. By introducing a freight specific charge for these commodities, we will increase the extent to which they contribute to the costs that freight imposes on the rail network. And in doing so, we will – other things being equal - reduce the overall size of the subsidy that Network Rail receives (through grant directly from government) and the fixed charges paid by passenger train operators. Ultimately, this will mean taxpayers get better value for money in return for their contribution to the railway.

1.21 We are making tough decisions not just about freight but about all rail-related expenditure as part of the periodic review. This is essential to provide long-term, sustainable benefits for the rail industry, customers and taxpayers into the next control period and beyond. The rail freight industry is a success story and we will work with government, the freight sector and the wider supply chain to ensure that this success continues. In this document we set out how we have responded to the issues and concerns raised by our stakeholders, explain how we have balanced them against our duties and objectives and how they fit within the broader direction of travel that we envisage for rail regulation.

## **Further development of charges into CP6**

1.22 As noted above, rail freight plays a crucially important role in Britain's economy. It has seen tremendous growth since privatisation, performance has improved and freight customer satisfaction has risen. We have played an important role in this success story – independent regulation has provided certainty and stability for the industry and our efficiency challenge to Network Rail has seen freight charges come down, for example by 35% between CP3 and CP4. Our incentives and interventions have improved freight performance, for example through our monitoring of the possessions disruption index and requirement on Network Rail to set up a freight recovery board where performance was poor. We want to see the freight success story continue into the future. And we expect that it will do so, in part through the efforts of the sector itself to reduce costs and improve customer service and in part through continued support from the UK and Scottish Governments, recognising the wider benefits it brings.

1.23 As noted above, given the amount of public financial support for the rail industry, in addition to the contribution from its users, we need to do what we can to improve value for money in the industry. We see charges that are more cost reflective as a key element in this. We are keen to improve the extent to which the charges that Network Rail's customers pay reflect the costs they impose on the network. Cost reflective prices help to drive cost savings and send better signals to Network Rail and its customers for the efficient provision and use of access to the network, which is itself a scarce resource. More cost reflective charges also improve transparency – making it clearer who pays for what and what they receive in return.

The decisions we have set out above constitute an important step towards more cost reflective charges, as they will result in some freight operators (and their customers) paying a greater share of the costs they generate in using the rail network. It should therefore over time improve efficiency and the fairness of cost recovery.

1.24 Through our PR13 consultations we have discussed with stakeholders the possibility of our undertaking further work to look at the structure of Network Rail's charges, with a view to improving their cost-reflectivity and overall efficiency. Industry stakeholders have expressed a willingness to work with us in doing further work on this in the early part of CP5, with a view to introducing any resulting changes in CP6. We look forward to working with the industry on this, in particular through the Rail Delivery Group, over the next two years.

## Structure of this document

1.25 The remainder of this document is structured as follows:

- (a) Chapter 2, "Variable usage charge", outlines our conclusion on the cap for this charge for freight services. We also explain our treatment of efficiency in setting the charge;
- (b) Chapter 3, "Estimating freight avoidable costs", sets out the work undertaken to analyse the costs caused to the network by freight traffic and allocates these costs to individual commodities;
- (c) Chapter 4, "A freight specific charge", outlines our conclusions on the charge after extensive consultation. The chapter provides details on the legal framework, the unit of the charge, the market segments affected and the level of the cap on their charge;
- (d) Chapter 5, "Wider work on track access charges and next steps", provides additional information on other consultations and work currently being undertaken by Network Rail and ourselves, and how we intend to work with the industry to develop the structure of track access charges beyond PR13;
- (e) The glossary explains acronyms and technical terms;
- (f) We explain the adjustments we presented in chapter 3 in Annex A ; and
- (g) Annex B sets out a cost benefit analysis of the freight specific charge for ESI coal.

## 2. Variable usage charge

### Key messages from this chapter

The rail freight industry has consistently asked us for early assurance of the scale of track access charges in the next control period. This is a difficult assessment to make because we have still to conclude on many aspects of PR13. But we have listened to and understand the rail freight industry's argument that early certainty is important in allowing them to plan their businesses in competition with road haulage. We are therefore setting a cap here on the average variable usage charge (VUC) for freight services, in advance of our PR13 final determination of the charge, which we will publish in October 2013.

We are confirming here the level of cap on which we consulted in May 2012, namely an average variable usage charge of £1.68 per kgtkm (2011-12 prices) for freight services. This is 5% to 7% higher than the basic calculations for the current charge, before taking account of expected improvements to efficiency and adding a 15% confidence interval margin to account for uncertainty. After completing this further work it is possible that charges will be higher than they were in CP4 but they will not exceed the cap we are setting out in this document.

It is important to note that the cap is not the average level we expect the charge to be, but a level which we are confident the charge will be below. And we are setting the cap before completing our revised assessment of Network Rail's efficiency challenge, which may result in a charge below the cap.

Work by consultants Serco conducted for Network Rail after the consultation suggests that the 15% confidence interval may be an underestimate, and that a higher confidence interval is appropriate. We understand, however, that assurance at this stage is important for industry confidence and have retained the 15% margin in order to produce an early decision on the cap in this document.

Similarly, in order to reduce uncertainty and minimise disruption to planning within the freight sector and wider supply chain, we are not proceeding with geographic disaggregation of the variable usage charge in CP5. We have listened to and understood the arguments made by our rail freight industry stakeholders that introducing geographical disaggregation into the current charging scheme would increase complexity and reduce the industry's ability to compete with road.

## Introduction

2.1 In this chapter we conclude on a cap on the average VUC for freight services on which we consulted in May 2012. Key information about the VUC is set out in Box 2.1.

2.2 The chapter is structured as follows:

- (a) A recap of our May consultation on the VUC;
- (b) A summary of consultees' views and our responses;
- (c) A description of evidence received after our consultation was issued;
- (d) Conclusions on setting a cap on the average freight variable usage charge;
- (e) An explanation of how we will adjust the charge following our determination of CP5 efficiency, including a worked example of what this means for the average charge; and
- (f) The significance of the cap for determining the level of charges.

### **Box 2.1: The variable usage charge:**

- recovers maintenance, renewal and operating costs that vary with traffic - predominantly track wear and tear costs
- applies to all passenger and freight vehicles
- currently accounts for around 70% of track access charges paid by freight services
- is levied per thousand gross tonne miles (kgtm) for freight wagons and per vehicle mile for passenger services
- is disaggregated by type of vehicle for passenger services and by type of vehicle and commodity for freight wagons.

2.3 The rail freight industry has consistently asked us for early assurance of the scale of track access charges in the next control period, not least because of concerns regarding the size of any new freight specific charge.

2.4 This is a difficult assessment for us to make because we have yet to assess Network Rail's strategic business plan and developing its methodology for attributing variable usage costs to different vehicles. In

addition, we will not conclude on the gain in efficiency we expect Network Rail to achieve in CP5 (which in turn is reflected in the charges its customers pay) until our PR13 final determination.

2.5 We have balanced these uncertainties with the freight industry's desire for certainty and predictability to plan their own businesses and to allow their customers to plan theirs by concluding here on a cap on the average variable usage charge for freight. We have listened to and understand the freight industry's argument that, given their competition with road, whatever assurance we can provide at this stage would be helpful.

2.6 It is important to note that the cap we are setting at this stage is not the average level we expect the charge to be, but a level which we are confident the charge will be below. And we are setting the cap before completing our assessment of Network Rail's efficiency challenge, which may result in a charge below the cap. It is also possible that charges will be higher than they were in CP4 but they will not exceed the cap we are setting out in this document.

**2.7 Throughout this chapter, unless stated explicitly otherwise, the costs and revenues are given in 2011-12 prices and at unit costs consistent with our PR08 determination for the efficiency Network Rail would achieve by the end of CP4.**

## Our May 2012 consultation

2.8 The key points from our May consultation relating to setting an early cap on the variable usage charge are set out in this section.

2.9 In order to give an early indication of levels of charges for the next control period (CP5), we asked Network Rail to estimate its variable costs and hence a likely range for the average variable usage charge<sup>19</sup>. Following consultation, it estimated average variable costs that were 5% to 7% higher than those calculated for CP4, net of any changes to efficiency assumptions, uncertainty margin or price base<sup>20</sup>. Given that this estimate included further analysis made in response to both the consultation replies and the review of the independent reporter<sup>21</sup>, we stated that we were broadly content with Network Rail's work on the variable usage charge to that point<sup>22</sup>.

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<sup>19</sup> [Freight caps – consultation on variable use charge \(VUC\) and freight only line charge initial cost estimates, Network Rail, November 2011](#)

<sup>20</sup> [Freight caps - conclusion on November 2011 consultation in relation to the variable usage charge \(VUC\) and freight only line charge initial cost estimates, Network Rail, 21 March 2012](#)

<sup>21</sup> The reporters are independent experts who provide us with assurance of the accuracy and reliability of Network Rail's information.

<sup>22</sup> Network Rail's documents on charges can be accessed at <http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/>

2.10 We highlighted that there are substantial differences, shown in the EU CATRIN<sup>23</sup> study, between Network Rail's estimates of its variable costs as a proportion of its total costs and the estimates of the same proportion for other European railways. We indicated that we continued to consider that Network Rail's bottom-up forward looking approach to estimating track costs was a better basis for the variable usage charge than top-down approaches used elsewhere. We therefore proposed to set a cap on the variable usage charge on the basis of Network Rail's analysis.

2.11 We proposed a cap on the average variable usage charge, across all passenger and freight services, at £1.79 per kgtkm. This was derived from an estimate of £1.56 per kgtkm plus a margin reflecting a band of uncertainty of 15%. We explained that the charge would then be adjusted for our determination of Network Rail's efficiency.

2.12 Network Rail had proposed a cap specific to freight services and we had announced our intention to implement a variable usage charge that would be geographically disaggregated (as compared to the existing charge that is highly disaggregated by vehicle and commodity but not by geography)<sup>24</sup>. But our proposals were insufficiently advanced to be able to propose a cap specifically for freight services that was also geographically disaggregated. We recognised that it may not be possible to implement geographically based charging at the start of CP5. Instead, therefore, we proposed a charge cap for freight services at a national level. The cap was as per Network Rail's conclusions: £1.68 per kgtkm, which is £1.46 per kgtkm plus a 15% confidence band.

2.13 We asked consultees for their views on:

- (a) whether, following Network Rail's consultation on variable usage costs, they had any further evidence that they wished to provide in relation to the process for estimating variable costs and average variable usage charges;
- (b) whether they agreed with our analysis, which led to a proposed confidence interval of 15% around Network Rail's estimates of variable usage costs;
- (c) whether they agreed with our approach to estimating an adjustment to variable usage charges for long-run cost efficiency.

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<sup>23</sup> Project CATRIN, [www.catrin-eu.org](http://www.catrin-eu.org)

<sup>24</sup> We set this out in *Setting the financial and incentive framework for Network Rail in CP5*, ORR, May 2012. This can be accessed at <http://www.rail-reg.gov.uk/pr13/publications/financial-incentives.php>

## Responses to the consultation

### Evidence on the methodology used

#### *Consultees' views*

2.14 A number of respondents questioned Network Rail's approach to estimating the contribution of non-track access to the variable usage costs. They argued that what they said was a top-down linear approach, based on engineering judgement, was unduly simplistic. Freightliner and RFG challenged the suitability of the Settle and Carlisle route as a case study on which to base network wide cost estimates.

2.15 RFG and GBRf were concerned that Network Rail had concluded that certain wagon types – in particular the relatively new RA10 wagons - were causing greater damage to civil assets than could have been predicted. RFG said that frequent changes in charges for different wagon types were not acceptable for those building equipment with a 30 year asset life.

2.16 Freightliner stated that Network Rail had not modelled the future changes in wagon mix, for example that coal transported in 100 tonne wagons is expected to decline whereas the number of 46 tonne wagons is expected to increase.

2.17 Some consultees were concerned about the overall robustness of Network Rail's analysis of cost variability, and its use in setting a cap on the variable usage charge. Several stakeholders (including DB Schenker, RFG and Freightliner) therefore commissioned Morgan Tucker to review Network Rail's analysis of cost variability<sup>25</sup>. Morgan Tucker's report was submitted in response to our consultation and the key issues raised in the report are explained in more detail below.

#### *Our response*

2.18 We discuss modelling of structures, including a point relating to the Settle and Carlisle line, in the next section (paragraph 2.30 onwards).

2.19 In principle, we agree that significant changes in the relative size of the variable usage charge for individual vehicle types are unsatisfactory and, given that the charges are intended to reflect the relative scale of infrastructure wear and tear from individual types of vehicle, should not occur. Instability of this sort may make developing the business case for more track-friendly vehicles more difficult. At the same time, it is important that all relevant parties, whether they are manufacturers, funders, passenger or freight operators or the infrastructure manager, are vigilant in considering and anticipating the implications of different attributes of rolling stock for infrastructure costs. This culture of vigilance is incentivised by Network Rail applying the best available evidence to calculate cost reflective charges. To balance these

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<sup>25</sup> [Response to Network Rail consultation - Variable Usage Charge Estimates and Freight Caps - report by Morgan Tucker, June 2012](#)



considerations, particularly where major changes to relative charges are proposed, we require a high level of confidence when approving charges that the changes result in a significant improvement in cost reflectivity.

2.20 Network Rail has modelled changes in costs by testing relatively small increases in network-wide traffic (+5%, +10% and +20% based on “equivalent gross tonne miles”). There are several other approaches it could have used, but the current methodology is designed to not differentiate geographically i.e. between where traffic goes on the network.

## **The cap and associated confidence interval**

### *Consultees' views*

2.21 A large number of stakeholders supported our setting the cap on the VUC early. Certain stakeholders were disappointed that a final decision on the cap was not being made earlier, and the British Ports Association considered that the lack of clarity on the exact level of the VUC cap was problematic and had created an atmosphere of concern.

2.22 Network Rail agreed that it was reasonable to apply a confidence interval of 15% on its estimate of average variable usage charges in order to set a cap. Other parties thought that the confidence interval should have been smaller, given that the estimates for track were based on the validated VTISM<sup>26</sup> model.

2.23 A number of respondents said that a 15% margin for the confidence interval represented a substantial potential increase in rates that was unpalatable to customers and could have a significant adverse impact on their business.

### *Our response*

2.24 We have listened carefully to the points made and have concluded that an early cap is appropriate for this periodic review, not least because there has been wider uncertainty associated with our work to establish a mark-up in the form of a freight specific charge. In developing the structure of charges for the subsequent control period, CP6, we want to start work early with industry so that broad changes are known well in advance and the industry can make investment decisions with reasonable assurance about the level of charges.

2.25 Work by consultants Serco for Network Rail undertaken subsequent to the consultation, and which we outline fully below, suggests that the 15% confidence interval may in fact be an underestimate. We understand, however, that assurance at this stage is important for industry confidence and have retained the 15% interval in order to produce an early decision on the cap in this document.

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<sup>26</sup> VTISM is the Vehicle Track Interaction Strategic Model.

## Adjusting for efficiencies

### *Consultees' views*

2.26 A number of respondents were content with levying the VUC cap based on end CP4 efficiencies, excluding the adjustment for CP5 improvements in efficiencies. RFG argued that the charge should be adjusted for a 10 year expected increase in efficiencies, on a similar basis to that for CP4 (which was based on efficiency catch up rather than frontier shift).

2.27 Freightliner stated that it was very difficult to follow through the logic of the figures in the consultation because the CP4 figures were not the charges being raised today.

### *Our response*

2.28 We confirm that the eventual final variable usage charge will be adjusted to account for expected gains in Network Rail's efficiency during CP5. Consistent with our policy for CP4<sup>27</sup>, we will set these variable charges on the basis of costs at the level of efficiency we expect Network Rail to achieve at the end of CP5 but, given the present uncertainty over the size of the CP5 efficiency challenge, the cap is set assuming end-CP4 efficiency.

2.29 Given Freightliner's concern about their difficulty in following the logic of some of the adjustments for efficiency, we have sought to aid interpretation with a worked example set out in this chapter.

## Evidence received subsequent to issuing our consultation

### Network Rail work to refine its variable cost estimates

2.30 We asked the independent reporter Arup to review Network Rail's cost variability analysis used to calculate average VUC<sup>28</sup>. We discussed Arup's work in our May consultation. Arup identified "red flag" issues, that is areas of major concern requiring follow up, with respect to:

- (a) structures: Network Rail's assessment was based purely on engineering judgement with no firm evidence on quantified impacts;
- (b) earthworks: Network Rail's assessment was again based on engineering judgement with no firm evidence on quantified impacts;

2.31 Network Rail has written to us, in two letters copied to the industry, covering:

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<sup>27</sup> In the PR08 determination the expected CP5 efficiency challenge was used, rather than that for CP4, to enable Network Rail to recover variable usage costs based on the long run efficient steady state cost (para 19.17).

<sup>28</sup> [Review of Analysis in Network Rail's Freight Cap consultation - report by Arup, March 2012](#)

(a) its response to the Morgan Tucker report, which focuses on issues relating to track and masonry underbridges<sup>29</sup>; and

(b) an explanation of how it had addressed the "red flag" issue raised by Arup<sup>30</sup>.

2.32 Network Rail's work, summarised in the second letter, analysing variable costs for embankment renewals, culvert renewals and metallic underbridge renewals is set out below. Its work on variable costs for masonry underbridges is summarised in the next section, in the context of the Morgan Tucker report.

#### *Embankment renewals*

2.33 At present, Network Rail believes that the 6% cost variability assumption applied in CP4 is still appropriate and should be retained. It has reviewed the evidence linking traffic loading to embankment failures and, therefore, costs.

2.34 Network Rail presents further evidence in its second letter in support of the mechanisms that cause damage (fatigue) for high plasticity clay embankments. In particular, it refers to a Mott Macdonald report - funded by RSSB<sup>31</sup>. This report supports Network Rail's view that the impacts of traffic loading contribute towards the number of embankment failures. The report also reviews previous work and papers on the vulnerability of embankments to train axle load, and the effects on embankment clay fill plasticity. Network Rail's letter summarises the report, which is also attached to its letter.

#### *Culvert renewals*

2.35 Network Rail has explained the rationale for the 5% cost variability percentage by further quantification of its estimate, with reference to its earthworks database.

2.36 It argues that culverts are impacted by traffic in broadly the same way as masonry underbridges. Therefore, it considers that the 14% variability assumption that it proposes applying to masonry underbridges is also relevant to culverts. However, it argues that the level of cost variability for culverts is attenuated to a degree by their depth below the track and thus a lower cost variability assumption (5%) is appropriate.

#### *Metallic underbridge renewals*

2.37 Network Rail considers that the 20% cost variability assumption set out in its March 2012 conclusions letter is appropriate, and explained the rationale for this assumption.

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<sup>29</sup> [Response to the Morgan Tucker Report reviewing our Variable Usage Charge estimates and freight cap. Network Rail, 18 December 2012](#)

<sup>30</sup> ['Top down' cost variability assumptions applied to embankment, culvert and metallic underbridge renewals, Network Rail, 18 December 2012](#)

<sup>31</sup> [Mott MacDonald report - Spandrel Walls - Managing the Risks](#)

2.38 Network Rail provides the detailed formula which is used in the CP4 VUC model to apportion metallic underbridge variable usage costs, and seeks to model the relationship between axle load and speed and damage to metallic underbridges. Serco has recently reviewed this formula as part of its work to re-calibrate VUCs for CP5. This formula takes account of Serco's recommendation to use a term representing axle load impacts which is consistent with the formula used in the relevant Euronorm technical standard. Serco also found that the speed variable relationship in the formula is consistent with industry standard AREMA guidelines for speed limits on bridges.

2.39 Network Rail considers that Serco's review supports its view that metallic underbridge costs vary with traffic. It also notes that that metallic underbridge costs have been considered variable with traffic since the 2000 Access Charging Review and cost variability estimates have ranged from 10%-20%. Therefore, its 20% estimate is consistent with previous 'top down' assumptions, albeit at the higher end of the range.

#### *Our assessment*

2.40 We consider that Network Rail has provided persuasive evidence regarding the cost variability of each of the categories of asset in question, though the size of the variability is still uncertain (and of course is likely to vary in response to external factors). Although the level of detail of modelling of these assets is substantially less than that for track, this reflects the dominance of track in variable costs.

#### **Morgan Tucker report (track assets and masonry underbridges)**

2.41 Morgan Tucker's report raised specific concerns over Network Rail's approach to estimating variable costs for track and for masonry underbridges. Morgan Tucker argued that overall there is insufficient information in Network Rail's consultation documents to justify the increase in variable usage costs. Ultimately, it suggests that existing VUCs should be frozen for CP5 in order to allow a thorough research programme to be completed, specifically on brick and masonry arch structures.

2.42 Specifically Morgan Tucker argued that:

(a) Network Rail has not correctly represented the impact of traffic growth on brick and masonry arch structures. Morgan Tucker claimed that the relationship between traffic growth and cost is particularly complex and that it is not appropriate to assume a direct linear relationship between the two. Morgan Tucker considered that Network Rail should have taken into account factors which affect this relationship, including traffic constitution and geographic spread. It believed that both factors are likely to change over time, resulting in a reduction in the average axle load operating on the network.

(b) it was inappropriate for Network Rail to use 'top down' engineering judgement in order to estimate the variable usage costs associated with non-track assets;

(c) the models that Network Rail used to estimate track variable usage costs (Vehicle Track Interaction Strategic Model (VTISM) and the Strategic Route Section Maintenance Model (SRSMM)) have not yet had enough time to be validated and tested.

(d) Network Rail's methodology for estimating the cost variability of brick and masonry underbridges is inappropriate, and it suggested that further investigative work needs to be undertaken. It considered that Network Rail should have taken into account technical factors such as vibration and resonance, train velocities, high speed passenger trains, construction materials and maintenance history.

2.43 We noted that Morgan Tucker had raised several potentially material issues, and therefore asked Network Rail to respond to the Morgan Tucker report. While we welcome the contribution that the Morgan Tucker report has made to this area, we also noted that:

- (a) some of Morgan Tucker's analysis and findings did not appear to be fully based on evidence; and
- (b) the Morgan Tucker report appeared to contain some misinterpretations of Network Rail's analysis.

*Network Rail's response to the Morgan Tucker report*

2.44 Network Rail has sought to address each of the points raised in the Morgan Tucker report in turn. Overall, Network Rail disagreed with Morgan Tucker's contention that there is insufficient information in NR's consultation documents to justify recalibrating VUCs for CP5.

2.45 Network Rail responded to the Morgan Tucker report by:

- (a) noting that the vast majority of variable usage costs have been estimated 'bottom up' using established models that have been reviewed by the Independent Reporter;
- (b) contending that its variability assumptions remain reasonable, while recognising that 'top down' variable usage cost estimates are likely to be more uncertain than 'bottom up' estimates. Network Rail admits that it does not currently have the tools to model 'bottom up' the level of cost variability for assets other than track. Therefore, it has applied a 'top down' approach;
- (c) arguing that freezing VUCs in CP5 would reduce cost reflectivity, result in costs not being recovered from those who cause them to be incurred, and potentially provide Network Rail with a disincentive to accommodate additional traffic on the network;
- (d) noting that Morgan Tucker do not contend that the non-track variable usage costs that it has identified are **not** variable with traffic. Nor does Morgan Tucker propose alternative cost variability assumptions;

2.46 Network Rail further explained how it is continuing to improve its understanding of civils assets, including the relationship between cost and traffic. As part of its SBP work programme, it is adjusting its cost models using probabilities that reflect the asset degradation found in practice. It is also undertaking further work that should contribute to improving its overall understanding of masonry structures. This

involves working with leading universities both here and abroad as part of various research projects: these research projects are described in more detail in its letter.

2.47 Network Rail did not accept Morgan Tucker's assertion that the track models have not had enough time to be validated and tested. VTISM, which calculates the majority of track variable usage costs, has been developed as part of a significant research programme led by the Vehicle/Track System Interface Committee (V/T SIC) and managed by the Rail Safety Standards Board (RSSB). VTISM (stage 1) was released in 2006 and has been used by the industry to manage changes around the vehicle / track interface. For example, it has been used by the Department for Transport (DfT) to evaluate new rolling stock bids and routes for cascading trains. VTISM and the SRSMM were also used to estimate track maintenance and renewal costs in the Initial Industry Plan (IIP) and are used to develop the Strategic Business Plan (SBP).

2.48 Therefore, using VTISM and SRSMM to estimate track variable usage costs is consistent with Network Rail's wider approach to modelling track costs. Network Rail also refuted Morgan Tucker's suggestion that VTISM and SRSMM are only capable of dealing with increased traffic scenarios: in its March 2012 conclusions letter it estimated the cost impact associated with a 10% reduction in traffic.

2.49 Network Rail has provided further evidence (including examples) in support of its methodology for estimating the cost variability of brick and masonry underbridges. Following review of this evidence, it continues to consider that its estimate of variable usage costs remains appropriate. The new evidence includes:

(a) further information on the cost of refurbishment, reconstruction and temporary strengthening of masonry bridges, included in its letter. This information is based on a sample of outturn costs from recent work on masonry bridges, which show remedial costs typically range from approximately £400,000-£2,500,000 per masonry structure. It explains the relatively wide range of estimates with reference to works which require significant disruption to the operational railway: for example, if the structure requires reconstruction or significant internal strengthening, the cost of the works tends to be very much higher. It claims that a £525,000 figure implied by the Morgan Tucker report would only be sufficient to finance one single span refurbishment per year;

(b) arguments against Morgan Tucker's claim that annual renewal expenditure on the Settle and Carlisle Line should be reduced by more than 85% to reflect its extreme topography: Network Rail provides examples from other parts of the network to support its analysis.

#### *Our assessment*

2.50 We consider that Network Rail has responded to the key points raised in the Morgan Tucker report using evidence-based arguments, which appear to deal with the substance of the issues raised by Morgan Tucker.

2.51 We also consider that the additional evidence provided by Network Rail to support its estimates of cost variability for civils structures represent an improvement in its understanding of these costs, and address the "red flag" issue raised by Arup by showing that cost estimates for this asset class are not solely based on engineering judgement.

2.52 Further to our review of the Morgan Tucker report and Network Rail's response to the report, we continue to believe that there is sufficient evidence in Network Rail's consultation documents to justify the proposed increase in track and non-track variable usage costs to be recovered through charges in CP5.

2.53 We do not accept Morgan Tucker's argument that existing VUCs should be frozen for CP5 in order to allow a thorough research programme to be completed, specifically on brick and masonry arch structures, as we are confident the amendment increases cost reflectivity.

### **Analysis of allocation of vertical track damage (Serco work)**

2.54 Network Rail appointed Serco to undertake a study using VTISM to inform the allocation of total variable usage costs (VUC) between passenger and freight vehicle types, on a national average basis. VTISM simulates the deterioration of rail, sleepers and ballast on plain-line and switches and crossings based on the combination of vertical and lateral forces from each axle that passes over the track<sup>32</sup>. Network Rail developed the remit for the Serco work in consultation with an industry working group (comprising ATOC, freight operators and ORR) and there was general agreement amongst the group that VTISM is the appropriate tool on which to base this study.

2.55 Serco's analysis indicates that the track damage associated with vertical forces resulting from heavy axle loads is greater than that estimated for our PR08 determination and that track is less sensitive to vehicle speed than was previously understood to be the case. While the overall variable usage cost is not changed by the work, it has significant implications for the split of costs between freight and passenger operators. Network Rail's initial estimates suggest that changes to reflect the Serco report would result in an increase in costs of up to 20% for freight. Some high speed passenger services would attract a lower share of variable usage costs than in CP4. But there is further work to do to understand the implications for different types of traffic. For instance we have yet to establish the implications for intermodal freight traffic, lighter commodities, local and commuter passenger services.

2.56 Industry participants have now had an opportunity to review and challenge the work and Network Rail has run a VTISM workshop to assist understanding of the model and the results produced by the Serco work. We have also raised a number of queries on the report to which Network Rail and Serco have

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<sup>32</sup> VTISM Analysis to inform the Allocation of Variable Usage Costs to Individual Vehicles, SERCO. December 2012

responded. Industry participants will have a further opportunity to review and challenge this work as part of Network Rail's consultation on the allocation of variable usage costs.

2.57 If the work is found both to be robust and to represent a significant improvement in the cost-reflectivity of charges, we will then consider the implications of the work for new charges as part of the package of all track access charges, and the PR13 settlement more widely, as part of our draft determination (which we are due to publish in June 2013). If we are concerned that the determination will result in large changes to charges in particular competitive markets, and/or that the changes implied are at odds with our general direction of travel on charges, then we will consider alternative options for implementing them.

2.58 Notwithstanding the fact that there is further work to do and its results are uncertain we remain committed to giving as much clarity to freight customers as we can to enable them to plan their businesses given the highly competitive markets in which they operate. Although after we consulted we received significant new evidence from Serco, because there is further work to do to test its robustness we think to give freight industry the certainty it needs, we should nevertheless proceed with the cap in any event. If, in due course, we consider that the Serco evidence is reliable then we will consider how to deal with it as part of our draft determinations that we will issue in June. However, we confirm that average variable usage charges for freight will not exceed the cap that we are setting out in this document.

## **Conclusions on setting a cap on the average freight charge**

2.59 We are confirming here the level of cap for the average freight variable usage charge on which we consulted in May 2012.



## Box 2.2: Conclusion on a cap on the average variable usage charge for freight vehicles

- We are setting a cap on the average variable usage charge for freight services for CP5 of £1.68 per thousand gross tonne km (kgtkm)<sup>33</sup> in 2011-12 prices, end CP4 efficiency.
- Network Rail will refine its cost estimates and allocation of charges to individual vehicles, for instance in light of the Serco report, but the average variable usage charge for freight services will not exceed this cap;
- We will determine the gains in efficiency we expect Network Rail to deliver for the end of CP5, and the charges that we determine will be consistent with our estimate of end-CP5 variable usage costs given those efficiency gains.
- In order to ensure certainty and minimise disruption to planning within the freight sector and wider rail freight haulage supply chain, we have decided not to proceed with implementing geographic disaggregation of the variable usage charge in CP5.

2.60 The cap of £1.68 per kgtkm represents Network Rail's best estimates of variable usage costs per unit of traffic for a small change in traffic. The estimate is 7.5% higher than its calculations for the current charge (on a consistent price base and consistent efficiency assumptions) and includes a 15% mark-up to account for the uncertainty. This is shown in Table 2.1

**Table 2.1: Average variable usage charge**

£ per kgtkm	Passenger and freight	Freight
CP4 average charge	£1.47	£1.36
Network Rail March 2012 estimated average for CP5 (5% to 7% above equivalent for CP4)	£1.56	£1.46
Cap for CP5 (15% above estimated average) – our May 2012 consultation	£1.79	£1.68
Cap for CP5 – our December 2012 conclusions	N/A	£1.68

<sup>33</sup> These are the units used by Network Rail in its corresponding calculation. The VUC is levied per thousand gross tonne miles, and the equivalent cap is £2.69 per kgkm.

2.60 The cap on which we are concluding relates to freight services only. Given that franchised passenger train operators have not been subject to consultation on a new charge (the freight specific charge), and are held neutral to changes in Network Rail's charges at a periodic review through their franchise contracts, we do not see the same value for the industry in setting an early cap on passenger variable usage charges. We had consulted on a cap on all services (passenger and freight) because we had been concerned that, in the context of proceeding with geographically disaggregated charges, we would be unable to conclude on an early cap specific to freight. We have listened to industry concern with respect to disaggregated charges, and decided not to implement the policy in CP5. We are consequently able to conclude on a freight VUC cap for CP5. We will conclude on the level of the cap for passenger variable usage charges in our final determination in October 2013, after having consulted in our draft determination in June 2013.

2.61 This announcement gives freight operators assurance over the maximum level of variable charges that they will face in CP5.

### Adjusting for our revised assessment of efficiency

2.62 In this section we seek to give greater clarity regarding how the efficiency adjustment might affect the levels of charges that we approve through use of a worked example.

2.63 In PR08 we determined track access charges for freight services for CP4 that were on average 35% below those for CP3<sup>34</sup>. And, following the freight charges review of 2001, freight track access charges in CP3 were on average 50% less than those prior to the review. A major driver for the substantial reduction in the variable usage charge for CP4 was our decision to let operators benefit from our assumed total level of maintenance and renewals efficiency improvements in CP4 and the further catch-up efficiency we had estimated for CP5. Together they amounted to a 34% reduction in variable charges relative to end-CP3 unit costs<sup>35</sup>.

2.64 In our final determination of variable charges in October 2013, we will replace the catch-up efficiency that we estimated in PR08 for CP5, with our PR13 determined efficiency for CP5. We do not yet know what the latter will be, but Table 2.2 sets out the advice we gave in March 2012 on the likely ranges for this.

**Table 2.2: ORR initial estimates of efficiencies for CP5 – relative to end-CP4 levels**

Efficiency overlay	CP5 PR08 assumptions	CP5 England and Wales	CP5 Scotland
Maintenance	16.5%	15% to 22%	16% to 21%
Renewals	16.5%	19% to 31%	16% to 33%

Source: Tables 5.10, 5.11 Advice to the Secretary of State for Transport on Network Rail's costs and outputs in CP5 and Advice to Scottish Ministers on Network Rail's costs and outputs in CP5, 15 March 2012.<sup>36</sup>

<sup>34</sup> Paragraph 19.121 of PR08 Final Determination. [PR2008: Determination of Network Rail's Outputs and Funding for 2009-14, ORR, October 2008.](#)

<sup>35</sup> Paragraph 19.18 of PR08 Final Determination, ORR, October 2008. This can be accessed at <http://www.rail-reg.gov.uk/upload/pdf/383.pdf>.

<sup>36</sup> These documents can be accessed at: <http://www.rail-reg.gov.uk/pr13/publications/advice-to-ministers.php>

2.65 In Table 2.2 we have compared the ranges we stated in March 2012 with our PR08 assumption that Network Rail would achieve a 34% improvement in efficiency by the end of CP5, of which 21% was expected to occur in CP4<sup>37</sup>. The remainder for CP5 would have been 16.5%<sup>38</sup> of the end-CP4 position.

2.66 Table 2.3 calculates, using illustrative figures, how we would expect the efficiency adjustment for charges to be applied.<sup>39</sup> For illustrative purposes only, we have taken the simple average level of the efficiency gains shown in the last two columns of Table 2.2 as the assumption for CP5, namely a 22% improvement in maintenance and renewal efficiency. In this illustration, the higher level of the charge derived from Network Rail's 2012 conclusions on costs would be offset by a higher adjustment for efficiency. The illustrative efficiency change involves a 5.5% greater reduction and, as the estimated base charge is 7.5% higher than previously, the net impact is an increase of 2%.

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<sup>37</sup> In our final determination we state that Network Rail should achieve a 21% improvement in efficiency in operating, maintenance and renewal expenditure by end CP4 as compared to end CP3. We will assess with this statistic is fully consistent with other assumptions, made by Network Rail in its calculation and by us in our determination, prior to finalising the adjustment.

<sup>38</sup> If we had assumed a 34% efficiency of which 21% had occurred in CP4, the remainder is 13%. This is equivalent to 16.5% of the end-CP4 assumption because  $16.5\% \times (1-21\%) = 13\%$ .

<sup>39</sup> Efficiency assumptions used for illustrative purposes are PR08 efficiency and the top end of efficiency assumptions estimated for our Advice to Ministers in PR13.

**Table 2.3: ORR initial estimates of efficiencies for CP5 – relative to end-CP4 levels**

Efficiency overlay	CP4 charge	CP5 charge – ILLUSTRATIVE VALUES	Percentage difference CP4 to CP5
Average charge per kgtkm, end CP4 efficiency  Source:	<b>£1.36</b>  <i>Network Rail calculation</i>	<b>£1.46</b>  <i>Network Rail conclusions March 2012</i>	<b>7.5%</b>  $(£1.46-£1.36)/£1.36$
Efficiencies assumed for CP5 in order to calculate actual charges  Source:	<b>16.5%</b>  <i>From PR08 final determination</i>	<b>22.0%</b>  <i>Value used for illustrative purposes</i>	<b>5.5%</b>  $22\%-16.5\%$
<b>Net impact on average charge, CP5 relative to CP4, illustrative example</b>	<b>2% = 7.5% - 5.5%</b>		<b>+2%</b>

### What the cap means for the determined level of charges

2.68 The level of the cap set out in this document (£1.68 per kgtkm) will not be exceeded by the final level of the average variable usage charge for freight. Network Rail will propose the final level of variable charges for freight and passenger vehicles. We expect final proposals to reflect Network Rail’s further work to estimate its costs and how they should be recovered from different types of vehicles.

2.69 We are not yet in a position to say whether the average freight variable usage charge will increase or decrease relative to the current control period (for which freight charges as a whole were 35% less than those for the preceding control period). However, we are clear that the final variable charges for CP5 will reflect the following:

- (a) Network Rail’s estimates of variable costs, on which it concluded in March 2012 and on which this cap is based, for freight services were 7.5% higher than those for CP4;
- (b) the 15% band to reflect uncertainty with respect to Network Rail’s estimates of costs and allocation between passenger and freight services in advance of the final determination;
- (c) Further refinement of Network Rail’s estimates of costs as reflected in its strategic business plan (SBP), and further work on the allocation of variable costs between passenger and freight services (which it will consult on shortly). We will continue to work with industry to scrutinise and audit its work.

2.70 Following the completion of Network Rail’s work to estimate charges we will:

(a) Adjust charges by our determination of Network Rail's efficiency with respect to its maintenance and renewal expenditure for CP5;

(b) In our PR13 draft determination, take account of all variable charges, and the wider PR13 settlement, together as a package in order to consider whether any individual charges are inconsistent with the charging framework or charging rules and should be adjusted in any way, bearing in mind our general view that charges should, over time, better reflect the cost and value of the infrastructure.

(c) In our PR13 final determination, set out Network Rail's track access charges for the whole of CP5. These will be adjusted each year for inflation according to a mechanistic formula stated in each operator's track access contract

# 3. Estimating freight avoidable costs

## Key messages from this chapter

- We define freight avoidable costs (FACs) as the Network Rail costs that would be foregone if freight services were no longer to use the network. Following consultation in May and our review of the responses received, we confirm our view that FACs should be the basis for setting any potential freight specific charge.
- Network Rail asked consultants L.E.K to estimate FACs. L.E.K has prepared lower and upper estimates of these costs, using Network Rail modelling and analysis and through extensive engagement with the industry. Its report is published on Network Rail's website.
- We asked Network Rail's independent reporters, Arup, to review aspects of Network Rail's work. Arup prepared revised lower and upper estimates as a result of its work.
- We have reviewed the methodology and made some adjustments to the range which we explain in this chapter to ensure that it is fit for the purpose of setting a cap on any freight specific charge. Our revised estimates of £278m to £400m a year prior to deductions for other track access charges compare with the indicative estimates in our May consultation document of £283m to £332m per year, on the same basis.
- We have applied Network Rail / L.E.K's allocation methodology to these estimates to produce a high and low estimate of FACs for each commodity, per thousand gross tonne miles, net of other track access charges.

## Introduction

3.1 In our May 2012 consultation we explained that we were considering introducing a charge based on FACs (FACs). In May we outlined a framework for this charge and consulted on it but, at that stage, we only had highly indicative estimates of the size of FACs.

3.2 We define FACs as the infrastructure costs that would be foregone if commercial freight services were no longer to use the network (where commercial freight services are those run for third party customers, as opposed to the infrastructure trains providing services for Network Rail).

3.3 The remainder of this chapter discusses the processes by which Network Rail has estimated FACs, our review of its approach, and the adjustments we have made to its total estimates, and to its estimates by commodity.

**3.4 Throughout this chapter, unless stated explicitly otherwise, the costs and revenues are given in 2011-12 prices and at unit costs consistent with our PR08 determination for the efficiency Network Rail would achieve by the end of CP4.**

3.5 In this chapter we:

- (a) explain why, following consultation, we continue to think that FACs are the appropriate basis for setting a freight specific charge or FSC;
- (b) summarise Network Rail's work estimating FACs and the review of it that we have undertaken;
- (c) conclude on the range of estimates of FACs that we are using as the basis for setting charges;
- (d) allocate costs to commodities; and
- (e) describe the further steps required to develop FSCs based on the calculated costs.

## Using FACs as the basis for a charge

3.6 We see the benefits of setting a FSC which recovers FACs as follows:

- (a) Delivering more cost reflective charges;
- (b) Increasing rail's value for money by reducing unfocused subsidy; and
- (c) Giving greater transparency of Network Rail's costs, which enables the freight industry to scrutinise those costs that Network Rail calculates are generated by freight traffic.

3.7 There are other definitions of cost that we could have used as a basis for pricing. We could have investigated whether charges presently made, which are based on short run marginal cost, should be supplemented by others so that the total charge reflected long run marginal cost. We could have sought to apportion costs that are common to freight and passenger to produce a basis of fully allocated costs.

3.8 In our May consultation we asked the industry and other stakeholders for their views on a proposed framework for setting a FSC which uses FACs as the basis for setting a FSC for segments of the freight

market that are able to bear such a charge. We received a large number of responses which discussed the implications of such a charge for the freight industry.

3.9 We have carefully considered all of the points that have been made to us and have discussed many of them in further detail with consultees and industry bodies.

3.10 Network Rail argued in its consultation response, building on its response to our PR13 May 2011 consultation, that where possible operator should contribute towards the full costs of using the rail network, and that it would be premature to foreclose the possibility of allocating an equitable proportion of common costs to freight traffic. We do not think that this is premature, however. Our consultant's analysis of rail freight markets, outlined in our consultation, suggests that pricing according to principles of fully allocated costs could result in substantial reductions in traffic and transfer to road haulage, with associated reductions in overall efficiency, including impacts on the environment.

3.11 We think that setting charges to recover FACs is an important step for normalising commercial relations with Network Rail: in other markets, a product will often be commercially viable if it can recover its avoidable costs, but not if it does not. By declaring in May 2012 that we were minded that any FSC would be set on the basis of recovery of associated FACs (rather than, for example, fully allocated cost), and focused on particular rail freight market segments to which the charge might apply, we reduced uncertainty on charges for the industry.

3.12 Some respondents argued that freight should not pay for any costs that are attributable to existing, historic inefficiencies in the network infrastructure. We think that the criteria for including such costs should be consistent with the basis on which Network Rail is funded. For example, if it has incurred enhancement costs efficiently, even if the forecast demand on which the case for funding depended does not subsequently materialise, it is still funded for the costs it has incurred.

3.13 A number of respondents did not agree with the framework for estimating FACs. GBRf, DRS, INS and NDS considered it to be subjective with too many variables which could impact the outcome. They thought that the range in the indicative estimate was so wide that it demonstrated that there is no specific formula or data of sufficient accuracy to determine this cost.

3.14 We do not agree that the concept of FACs is subjective and set out arguments in this decision document in support of it and of the variables used in reaching our conclusions. We explained in our consultation that the costs we presented there were indicative. Further work that we and Network Rail have undertaken subsequently has been used to address this concern: this further work is set out in this chapter.

3.15 As described later in this document (chapter 5) we are currently in discussions with Rail Delivery Group (RDG) about establishing a programme of work in CP5 to consider and develop options for



improving the structure of charges. We do not think it would be appropriate to attempt to introduce a new basis for freight charges, such as Long-run marginal costs (LRMC), in advance of that work.

3.16 A number of respondents also commented in response to questions about how we have segmented the rail freight market and how we deal with wider market and second order impacts. We consider these comments in the next chapter.

3.17 We have considered all of the points raised in consultation and have taken on board many of them, for example, in relation to revisiting the range of FACs. We continue to think that FACs are relevant for calculating any FSC, and the remainder of this chapter discusses how to estimate their size for freight in general and individual commodities in particular.

## Network Rail's methodology

3.18 When we consulted on the FSC, we only had indicative estimates of FACs derived from high-level analysis that we published in 2006. We estimated these costs to be around £200m to £250m when existing (CP4) track access charges had been deducted (or £283m to £332m without other charges being deducted<sup>40</sup>). We explained that Network Rail had commissioned work to estimate FACs, and that this work would conclude in autumn 2012.

3.19 Network Rail commissioned independent consultants L.E.K to estimate FACs. L.E.K has engaged extensively with the rail freight industry and used Network Rail modelling and analysis in order to estimate FACs. L.E.K also developed an allocation of this cost between freight commodities (or market segments). L.E.K's final report is published on Network Rail's periodic review 2013 webpage<sup>41</sup>.

3.20 L.E.K prepared two estimates of FACs: a high case and a low case. It did not prepare a "best estimate" or "central estimate" of costs. We think that it is useful that L.E.K has sought to explore the uncertainties associated with the estimates of costs by preparing high and low estimates (though we think that the range of uncertainty is overstated, and make certain adjustments to address this as set out later in this chapter). However, for the purpose of calculating any FSC, we would require Network Rail to prepare an estimate of FACs on the basis of the best available evidence, just as it does all other charges.

3.21 L.E.K, with input from us and from industry, defined FACs as the estimated average annual cost savings from the present into the long run that Network Rail would gain from removing commercial freight

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<sup>40</sup> This is £230m to £270m in Table 5.1 of our consultation, updated to 2011-12 prices.

<sup>41</sup> See <http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/orr-publications-on-PR13/>

traffic from its network. L.E.K estimated average FACs over 35 years<sup>42</sup> using rail freight traffic forecasts developed for the Initial Industry Plan (IIP)<sup>43</sup>.

3.22 In defining the scope of the study, L.E.K set out more detailed assumptions for estimation of FACs and agreed these assumptions with Network Rail. In particular:

- (a) without commercial freight traffic, Network Rail would still be required to maintain and renew the passenger network, and would therefore own or subcontract engineering trains to support this activity.
- (b) L.E.K did not consider impacts on third parties such as passenger services: for example, it did not assess an option to use the released capacity for passenger services. We consider that, while this simplifying assumption (which we agreed to on grounds of pragmatism) would be appropriate in a context where other charges reflected the value of capacity (for example if there were a scarcity charge), in the absence of such charges the approach tends to result in a conservative estimate of FACs. This is because the released capacity would save additional costs to the passenger network, for example enhancements to increase capacity would no longer be necessary.

3.23 L.E.K estimated the costs of removing freight from the network as the difference between:

- (a) “a mixed use railway as per the initial industry plan”, where L.E.K assumed that the current network configuration, supporting infrastructure and Network Rail procurement of supporting services continues as now; and
- (b) “no commercial freight”, where L.E.K assumed that no commercial rail freight used the network, but that there was no change to the current pattern of passenger services. L.E.K assumed that all assets currently required to support freight operations would be decommissioned and that no further investment would be committed to the benefit of rail freight.

3.24 L.E.K estimated annual total recurring costs with reference to freight traffic growth forecasts. It also calculated the annual impact of one-off costs, such as committed infrastructure investments, on the basis of their amortisation and Network Rail's allowed return on the saved capital expenditure. For each year, L.E.K therefore estimated total FACs by adding total recurring costs and the relevant annualised impact of one-off costs. In order to produce estimates of total costs, L.E.K estimated a range of costs - defined in terms of “low” and “high” estimates - for each element of the FACs shown in Table 3.1. It then added together the individual “low” and “high” estimates for all cost elements to produce total “low” and “high” estimates of FACs.

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<sup>42</sup> Variable usage costs used to calculate the variable usage charge are calculated over 35 years, so that renewal peaks are smoothed. LEK decided, for consistency, to calculate FACs over 35 years also.

<sup>43</sup> The initial industry plans, September 2011, have been published by Network Rail at <http://www.networkrail.co.uk/iip.aspx>

3.25 L.E.K classified FACs (including some costs that are already recovered through existing charges) in seven categories, which are described in Table 3.1.

**Table 3.1: L.E.K's cost categories for FACs estimation**

	Category	Description
1	Freight-only Lines (FOL)	Costs associated with Freight-only Lines as identified in Network Rail's March 2012 conclusions
2	Redundant fixed costs	Fixed costs associated with predominantly freight lines, loops, sidings, 2/3/4th track lines, and property made redundant by removal of commercial freight operations. These could be removed from the network over time and / or freed-up for disposal
3	Variable usage costs	Variable usage costs associated with commercial freight traffic on mixed usage lines
4	Redundant enhancements costs	Currently-planned network enhancement costs (e.g. SFN) that would no longer be required after removing commercial freight
5	Consequential cost reductions	Potentially improved maintenance access & potentially reduced Network Rail spend on performance and possessions regimes ("Schedules 4 and 8")
6	Consequential cost increases	Increased costs due to lack of access to freight services such as engineering trains, de-icing, leaf removal, weed-spraying
7	Network Rail staff costs	Freight-related staff costs that could be avoided by removing commercial freight

## Reporter review of Network Rail's estimates of variable usage costs

3.26 We asked the independent reporter Arup to review two aspects of the L.E.K estimates of FACs: the variable usage costs, and the allocation to commodities. Arup's work reviewing variable usage costs is described in this section. Arup also reviewed the allocation of costs to commodities.

3.27 The track costs, which form the majority of variable usage costs, were estimated by Network Rail using the Vehicle Track Interaction Strategic Model (VTISM)<sup>44</sup>. L.E.K's "high" case was based on the

<sup>44</sup> VTISM has the capability to assess how changes to traffic volumes and vehicle characteristics can affect track renewal, maintenance and inspections costs. It was developed on behalf of the Vehicle/Track Systems Interface Committee by RSSB and Network Rail to support the industry in managing changes around the vehicle / track interface more effectively and to realise savings through optimised track and vehicle maintenance and renewal. It links inputs such as track and vehicle characteristics to outputs such as asset life, future condition and performance.

VTISM estimated cost reduction resulting from removing all freight traffic and amounted to £178m in variable usage track costs a year.

3.28 A number of stakeholders, including the RFG and individual freight operating companies, expressed concern regarding the robustness of VTISM with respect to the estimate. They noted that it implied a significantly higher unit rate than that derived for the calculation of the variable usage charge, and therefore implied that the model was non-linear.

3.29 L.E.K shared some of these concerns and addressed them by developing a “low case” using the cost-per-unit rate taken from the VTISM run used to estimate the variable usage charge (a test that consisted of 5%, 10% and 20% increases in all traffic). L.E.K applied this unit rate to all commercial freight tonne km to calculate a total variable usage cost for track associated with the removal of freight traffic of £70m a year.

3.30 We shared stakeholders’ desire to understand whether the VTISM model provided a robust basis for estimating FACs associated with track usage. We therefore mandated the independent reporter Arup to:

- (a) review Network Rail’s (NR’s) use of the VTISM model to support the work it commissioned from L.E.K to estimate FACs; and
- (b) advise on the robustness of the VTISM model outputs for the purpose of calculating FACs and on the underlying data and assumptions used to produce these outputs.

3.31 We asked Arup to review the VTISM modelling of removal of all freight (L.E.K’s high case), because these were the costs we had asked Network Rail to estimate. (The low case did not appear to us to be of relevance to the estimation of FACs, and in any case had been reviewed by the reporters previously in the context of estimating the variable usage charge.)

3.32 Arup’s report is available on our website<sup>45</sup>.

3.33 Arup noted that Network Rail had modelled the variable track usage costs saved when all freight traffic (including infrastructure trains) was removed from the network, whereas it had been asked to estimate cost savings associated with commercial freight. With that important exception, Arup considered that Network Rail’s use of VTISM to estimate freight avoidable track maintenance and renewal costs was appropriate. Arup undertook a simple adjustment to Network Rail’s estimate to attempt to correct for the treatment of non-commercial freight services, resulting in estimated FAC for track variable usage costs falling from £178m to around £160m. However, Arup considered that there was some further uncertainty in the calculated costs: for example the VTISM run was undertaken assuming asset policies did not change as a result of the removal of commercial freight services, whereas in reality the asset policies for a passenger only railway would probably be such that further maintenance and renewal cost efficiencies

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<sup>45</sup> See <http://www.rail-reg.gov.uk/pr13/PDF/freight-avoidable-costs-2012.pdf>

would be realised. Taking these factors into account Arup judged that the avoidable freight variable usage cost for track was in the range of £144m (10% below the modelled estimate of £160m) to £210m (+30%). The range was not symmetrical around the central estimate because the factors that Arup identified as limiting its confidence in the results were more likely to produce underestimates than over estimates. In its report to ORR and Network Rail, Arup made the following recommendations for improving the estimates of variable usage costs:

- (a) Non-commercial freight traffic should be added back and VTISM re-run to produce more accurate results.
- (b) Sensitivity tests should be carried out to gain a better understanding of M&R cost changes as freight is removed.
- (c) As a further sense check on the cost curve, historic changes to freight and passenger gross tonnage km should be reviewed and compared against the change in observed renewal costs.

## **Network Rail's estimates of total FACs**

3.34 Table 3.2 shows Network Rail's estimates of FACs, prepared by L.E.K. The table also shows the revised estimates of variable usage costs prepared by Arup, and the impact of this adjustment on total costs. The largest costs are variable usage costs, redundant enhancements costs, consequential cost reductions and consequential cost increases. Together, these categories account for over 70% of the estimated costs in both the low and the high scenarios – allowing for the fact that consequential cost increases are netted off other costs. Of these cost categories, variable usage costs and, within that category, track variable usage costs, make by far the largest single contribution – accounting for over 55% of all costs in the high scenario. It is primarily Arup's adjustment to track variable usage costs, based on its analysis of VTISM outputs, that drives the adjustment to the total range of FACs.

**Table 3.2: Network Rail's estimates of FACs (£m a year)**

#	Description <sup>46</sup>	Gross Costs		Costs recovered through charges		Net Costs	
		Low	High	Low	High	Low	High
1	FOL	17	23	6	8	11	15
2	Redundant fixed costs	7	12	0	0	7	12
3	Variable usage costs	96	215	87	94	9	121
3	Variable usage costs – as revised by reporters	171	246				
4	Redundant enhancements costs	60	84	0	0	60	84
5	Conseq. cost reductions	58	77	17	26	41	51
6	Conseq. cost increases	-88	-39	0	0	-88	-39
7	NR staff costs	4	5	0	0	4	5
	<b>Total – L.E.K</b>	<b>154</b>	<b>377</b>	<b>110</b>	<b>128</b>	<b>44</b>	<b>249</b>
	<b>Total – adjusted for reporter's recommendations</b>	<b>229</b>	<b>408</b>	<b>110</b>	<b>128</b>	<b>119</b>	<b>280</b>

Source: Page 21 of L.E.K final report and ORR analysis.

## ORR's assessment

3.35 Following the work of L.E.K and Arup we have reviewed the FAC estimates to ensure that they are fit for the purpose of setting caps on the FSC. For reasons of simplicity and transparency we have sought to keep changes at a high level: where we have not made amendments, this should not be interpreted as our endorsement of the more detailed aspects of L.E.K's methodology. We have:

- (a) reduced the divergence of L.E.K's high and low cases by 5% at each end for each category of cost, on the grounds that they combine a number of assumptions that, while not in themselves improbable, are less likely to occur in combination;
- (b) assumed that Network Rail procures in a way that delivers best value for money, and hence that it would lease rather than purchase engineering trains (the "high case" for the consequential cost increases category is therefore used for both the low and high cases);

<sup>46</sup> Category definitions are provided in Table 3.1

(c) made further adjustments that result in lower estimated costs (such as reducing estimates of avoided enhancement costs to allow for high contingency levels), added an estimate for expected land disposal proceeds, which was excluded from the L.E.K analysis, refined L.E.K's initial estimates of revenue associated with existing track access charges and included a separate cost item showing the effect of netting off Electricity for Traction (EC4T) charges from total costs as this item was not explicitly presented elsewhere in L.E.K's analysis.

3.36 Table 3.3 sets out our revised estimates of FACs, both in total and with existing track access charges netted off. Full details of the adjustments made to L.E.K's estimates are set out in Annex A.

**Table 3.3: Adjusted FAC estimates (£m a year)**

#	Description	Gross Costs		Costs recovered through charges		Net Costs	
		Low	High	Low	High	Low	High
1	FOL	18	22	-6	-8	12	14
2	Redundant fixed costs	7	11	0	0	7	11
3	Variable usage costs <sup>47</sup>	171	236	-61	-61	110	175
4	Redundant enhancement costs	63	76	0	0	63	76
5	Consequential cost reductions	56	66	-3	-6	52	60
6	Consequential cost increases	-41	-37	0	0	-41	-37
7	NR staff costs	4	5	0	0	4	5
8	Land disposals	0	22	0	0	0	22
9	Other (net off EC4T charges)			-8	-13	-8	-13
	<b>Total</b>	<b>278</b>	<b>400</b>	<b>-78</b>	<b>-88</b>	<b>200</b>	<b>312</b>

3.37 Following our adjustments, the estimate of FACs at this stage in PR13 is £278m to £400m a year, prior to any netting off of track access charges.

<sup>47</sup> Figures differ from those in paragraph 3.33 as the Arup estimate forms a part of a wider calculation of variable usage costs

3.38 Figure 3.1 compares estimates of FACs with our adjustments, the low estimate is 21% higher than the L.E.K / Arup estimate, and the high estimate is 2% lower than the L.E.K / Arup estimate. The primary reason for the material increase in the adjusted “low” estimate relative to the unadjusted Network Rail estimate is that we have incorporated the Arup recommendations for variable usage costs. This effect is illustrated in Figure 3.1, which compares the following estimates:

(a) A comparative top-down estimate based on:

(i) current outturn maintenance and renewal track costs (taken from Network Rail’s most recent regulatory accounts); and

(ii) cost variability estimates taken from the 2011 CATRIN European cost benchmarking study, and ITS analysis of relevant benchmarks, of 55% for track renewals and 45% for track maintenance.

This top-down estimate excludes the majority of fixed costs that are included in the other estimates described below. Therefore, as would be expected, this top-down estimate is rather lower than the average of the other estimates;

(b) The indicative figures presented in Table 5.1 of our May consultation document<sup>48</sup>, without netting off costs recovered through charges, applying inflation of 23% to convert the estimates to 2011-12 prices;

(c) The unadjusted Network Rail/L.E.K estimates as explained above;

(d) The adjusted Network Rail/L.E.K figures adjusted for the variable usage costs in accordance with Arup’s recommendations;

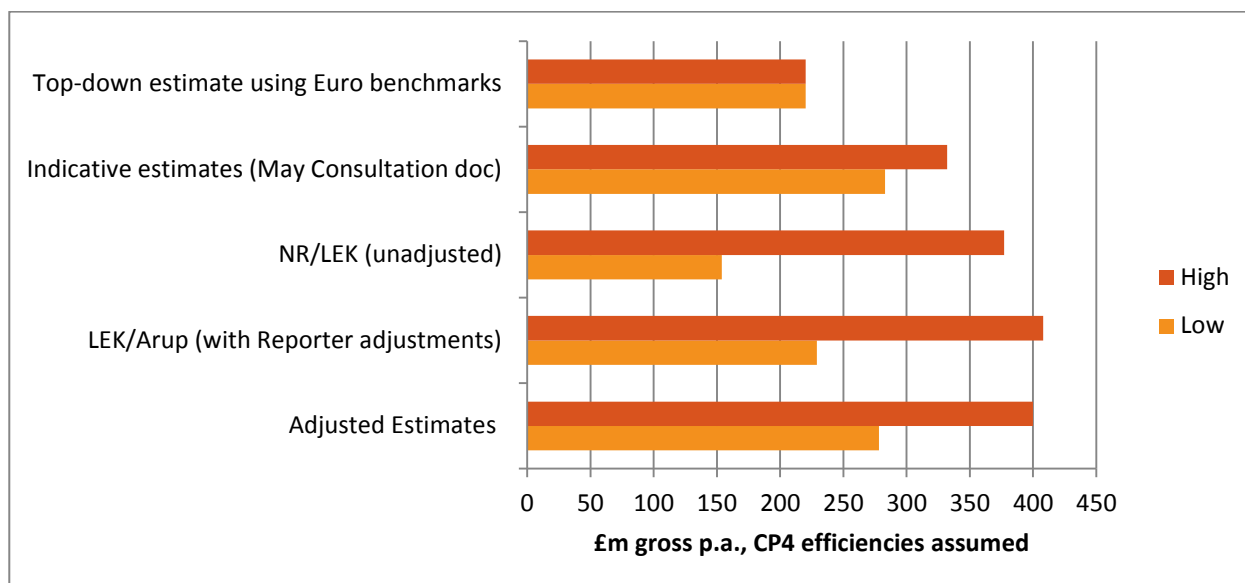
(e) The adjusted estimates as presented in Table 3.3.

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<sup>48</sup> Referred to in Figure 3.1 as “May Consultation doc”



**Figure 3.1: Comparative estimates of gross FACs**



## Allocating costs to commodities

3.39 We asked Network Rail to prepare estimates of FACs allocated to rail freight market segments, based on commodity.

3.40 L.E.K, on Network Rail's behalf, estimated the allocation of aggregate FACs to commodity using top-down metrics for example, tonne-kilometres. Table 3.4 summarises the metrics L.E.K used to allocate the FACs in each of the seven cost categories. Specific future enhancement costs were matched to the commodities they would most likely benefit. The traffic volumes are taken from IIP forecasts, consistent with forecasts used to estimate costs.

**Table 3.4: Network Rail /L.E.K commodity allocation metrics**

	Category	Primary allocation metric
1	FOL	FOL gross tonne km & manual input
2	Redundant fixed costs	Gross tonne km
3	Variable usage costs	Gross tonne km (track), train km (signalling), electrified train km (electrification)
4	Redundant enhancements costs	Individual schemes allocated to specific commodities, costs apportioned based on gross tonne km
5	Conseq. cost reductions	Train km (Schedule 4 & capacity charge), delay minutes (Schedule 8), Coal gtkm (coal spillage costs)
6	Conseq. cost increases	Gross tonne km
7	Network Rail staff costs	Gross tonne km

3.41 For spent nuclear fuel, traffic forecasts are based on Network Rail/L.E.K analysis of current nuclear traffic flows, which was used to estimate nuclear traffic as a proportion of “Other” freight traffic. L.E.K’s estimates of growth in nuclear traffic are taken directly from IIP growth forecasts for “Other” commodities.

3.42 We asked the independent reporter to carry out computational checks on the allocation. Arup noted some minor inconsistencies relating to allocation of enhancements, but these did not impact on the estimates of FACs and no other errors were identified.

3.43 We have used the L.E.K methodology to allocate the cost estimates to commodities with the exception of the treatment of freight-only lines, which we describe below. We allocated land disposal proceeds (for which we have prepared an estimate, in the absence of Network Rail doing so) on the basis of gross tonne km.

3.44 Respondents to our consultation stated that spent nuclear fuel traffic was due to fall (as legacy waste was processed) and, to the extent that the costs being recovered were fixed, were concerned that the charge to recover such costs would increase over time. This is an important issue for freight-only lines, and Network Rail will need to demonstrate that the traffic forecasts are consistent with the costs it calculates for freight-only lines. For other costs, the allocation metrics are largely proportionate to traffic levels, with the result that for spent nuclear fuel, a commodity making up only a very small proportion of total rail freight traffic, the cost per unit calculated is largely unaffected by uncertainties in its traffic forecasts.

## Costs associated with freight-only lines

3.45 Network Rail had previously consulted and concluded on costs for freight-only lines for ESI coal and spent nuclear fuel in March 2012 for the purpose of setting a cap on the freight-only line charge, and its analysis was subject to reporter review. L.E.K’s analysis for Network Rail was based on this work, with some adjustments, and extrapolated to other commodities.

3.46 We consider Network Rail’s March 2012 methodology and associated cost estimates to be a more appropriate basis as an estimate for the freight-only line charge than the estimates prepared by L.E.K because Network Rail’s approach, which was established in PR08 and subject to consultation in PR13, has a more sophisticated allocation for ESI coal and spent nuclear fuel<sup>49</sup>. We are presenting avoidable costs for other commodities net of any FOL costs.

3.47 The values for ESI coal and spent nuclear fuel FOL costs are shown in Table 3.5.

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<sup>49</sup> L.E.K. also made adjustments to Network Rail’s established methodology to include decommissioning costs; our current view is that it is not appropriate to include these costs.

**Table 3.5: Freight-only line costs, Network Rail March 2012 conclusions (£m a year)**

<b>Commodity</b>	<b>Central estimate</b>	<b>High estimate (=+15%)</b>
ESI coal	£4.94m	£5.68m
Spent nuclear fuel	£1.27m	£1.46m
Total	£6.21m	£7.14m

3.48 Network Rail did not prepare detailed estimates of freight-only line costs for other commodities, though we note that the estimated freight-only line cost for iron ore are zero because that traffic does not currently use freight-only lines.

### **FACs by commodity**

3.49 Table 3.6 sets out the adjusted low and high case FACs presented in Table 3.3, net of other variable track access charges and freight-only line costs<sup>50</sup>, allocated to commodity according to the Network Rail / L.E.K's methodology.

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<sup>50</sup> As the existing freight-only line charge applies to some commodities and not others, we think that it is clearer to present the allocation of FACs for the purpose of setting a cap excluding these costs.

**Table 3.6: FACs by commodity, net of variable charges and excluding freight-only line costs**

	Adjusted Net Costs (£m a year)	
	Low	High
Aggregates / Construction Materials	21	29
ESI Coal	24	43
Coal Other	1	2
Intermodal	105	160
Iron Ore	0	1
Nuclear	1	1
Petroleum	7	13
Steel	7	12
Other	23	36
<b>Total</b>	<b>189</b>	<b>297</b>

3.50 As part of the framework we consulted on in May, we discussed the potential for levying a charge to recover FACs only on selected commodities. Table 3.7 shows the FACs (excluding freight-only line costs and net of variable charges) per thousand gross tonne miles for the three of the commodities for which in our May 2012 consultation we proposed a FSC to apply.

**Table 3.7: Estimates of net freight avoidable unit costs - by key commodity**

Commodity	FACs net of FOL costs (£/kgtmiles)	
	Low	High
ESI coal	4.04	6.62
Iron ore	2.96	5.28
Spent nuclear fuel	11.64	16.48

3.51 The estimated costs per kgtm vary by commodity. There are various reasons for this. For example, enhancements affect intermodal services to a greater extent than some other market segments. Spent

nuclear fuel services have a relatively low mass per train<sup>51</sup>, so although the cost allocated to them per tonne mile is relatively high, their cost per train mile is relatively low.

3.52 We consider this allocation between commodities, while high level, to be cost reflective and provide an appropriate basis for setting a cap, if relevant, on the FSC for individual commodities. We do, however, expect Network Rail to refine the allocation of costs to individual commodities further to the extent that the refinements may be material to the FSCs ultimately determined. We discuss this in chapter 5. In particular, we note that:

(a) The allocation metrics for some of the consequential cost reductions, notably costs associated with the possessions regime (schedule 4), are not sophisticated and are a key driver of the estimated costs for spent nuclear fuel;

(b) We would expect the allocation of variable usage costs to be refined so that they are consistent with the allocation metrics for the variable usage charge.

## Conclusions on FACs

3.53 It is important that Network Rail and freight operators understand the costs that freight services impose on Network Rail, and are incentivised to work together more effectively to reduce these costs.

3.54 We confirm in this chapter that we consider that FACs, that is Network Rail's costs that would be foregone if freight services were no longer to use the network, are relevant costs to consider when setting the structure for any potential FSC.

3.55 We have reviewed Network Rail's work to estimate FACs and, subject to some adjustment, consider it fit for the purpose of setting caps on any FSCs.

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<sup>51</sup> Less than 100 tonnes per train compared with about 1000 tonnes for freight on average.

## 4. A freight specific charge

### Key messages from this chapter

We are making important changes to the structure of track access charges to make them more cost reflective through the addition of a freight specific charge (FSC). Through our decisions relating to this charge we believe we have created a sensible balance between, on the one hand, driving efficiencies in infrastructure costs and delivering better value for money and, on the other, the need not to shift rail freight to road or otherwise exclude it.

The freight specific charge will be subject to a cap and set as a mark-up on the variable usage charge to recover freight avoidable costs (FACs). It will apply to ESI coal, spent nuclear fuel and iron ore traffic. In this way, rail freight will pay a greater contribution to Network Rail's costs, paying more of the costs that it generates on the network. Responding to issues raised in our May 2012 consultation, we will consult shortly on whether the charge should also apply to biomass, and will conclude on this as part of PR13. We have accepted stakeholders' arguments that the charge should not apply to other (non ESI) coal traffic.

We have listened to concerns expressed by some stakeholders during our extensive consultation on the robustness of the estimates of FACs, potential negative impacts of the scale of the charge and associated uncertainty such a charge could create for industry. We have taken these comments into account and are therefore:

- taking a conservative approach to the level of FACs we seek to recover from the charge by setting the cap on the charge at the lower end of the range of our estimates for FACs;
- delaying implementation of the charge until 1 April 2016 (for the first two years of CP5 the current charging structure, including the freight-only line charge, will apply) to give the freight operators and their customers time to adapt; and
- asking Network Rail to consult on phasing in the charge over the last three years of CP5 on a gradual basis so that the charge is fully in place up to the level of the cap by the end of the control period (for example introducing, say, 20% of the full charge in year 3 of CP5, 60% in year 4 and 100% in year 5).

## Introduction

4.1 In this chapter we conclude on our consultation to levy a freight specific charge (FSC) on certain commodities.

4.2 In defining the structure of charges for freight we need to strike a balance between:

(a) the important wider contributions that rail freight makes to the economy and the environment, over and above standard commercial value, by reducing levels of road haulage, which we recognise provides a case for subsidising rail freight. We do this by setting track access charges at a level below that which would achieve full cost recovery; and

(b) the principle that freight operators should pay for the costs that they impose on the rail infrastructure, including fixed costs. As explained in chapter 3, we refer to these costs as FACs by which we mean the costs that Network Rail would not incur if commercial freight services did not run on the network.

4.3 We have always recognised that the balance between these two factors differs sharply by rail freight commodity. Since rail privatisation we have consistently determined a structure of charges with higher charges for those commodities (or market segments) that face less competition from road. In PR08, for CP4 for example we determined a freight-only line charge, recovering fixed costs that would be paid only in relation to haulage of ESI coal and spent nuclear fuel. In PR13 we are revisiting this balance, and have proposed a FSC to recover freight avoidable costs (FACs) for those market segments in which road haulage does not materially compete with rail.

4.4 In concluding on this policy, we have undertaken extensive consultation with a wide range of stakeholders. We absolutely understand that this policy, which means a large increase in track access charges for certain commodities, will mean significant changes for some businesses. We have taken these considerations into account in reaching our conclusions and have amended our decision as compared to the proposals on which we consulted in May in recognition, among other things, of points made by stakeholders about the potential impact of these charges on their businesses.

4.5 This chapter is structured as follows:

- (a) We start by re-capping on our May consultation;
- (b) We then set out the legal framework for the charge;
- (c) We conclude on the unit of the charge;
- (d) We assess rail market demand;
- (e) We consider the wider impacts of a charge;

(f) We discuss implementation issues; and

(g) We conclude on a cap on the charge for each market segment and plans for phasing in the charge.

4.6 In reaching our decisions we have considered all of the points made by consultees in relation to the FSC. We respond to many of them in this chapter. In addition we will be publishing a summary of consultation responses and our responses to them.

## **Our May 2012 consultation**

4.7 In May 2012 we consulted on the introduction of a new track access charge for certain rail freight commodities in CP5, in order to recover infrastructure costs caused by freight operating on the network (FACs) that are not currently recovered from other freight charges.

4.8 We explained how we proposed to use analysis of rail freight traffic, including the extent to which it competes with road freight, to determine which market segments would bear such a charge. We also considered whether to levy a cap on the charge so that the forecast fall in traffic resulting from the charge did not exceed a specified amount in any one market segment.

4.9 In our consultation and on the basis of market analysis, we proposed to levy a charge on FACs on ESI coal, iron ore and spent nuclear fuel. We also said we would consider levying the charge on other coal traffic. We proposed to defer making a decision on whether to apply the charge to biomass until after our final determination.

4.10 We did not specifically propose a level of charge, but used the early work on FACs to estimate a range of possible charges, asking our consultants NERA and MDST to test options of £5, £10 and £15 per thousand net tonne km for ESI coal (equivalent to £4, £8 and £12 per kgm charge net of existing variable charges and the freight-only line charge). And we set out options for the basis on which the charge should apply (e.g. per mile or per tonne or a combination of both).

## **Legal framework**

4.11 In our consultation document, we described the legal test from the Railways Infrastructure (Access and Management) Regulations 2005 (the “Access and Management Regulations”) that we are applying when deciding whether to levy a mark-up. We also explained how, in addition to this test, we had to consider any proposed mark-up against our statutory duties which are primarily set out in section 4 of the Railways Act 1993. Below we set out the main legal concerns raised in consultation responses, our view on them and then confirm the legal test that we have applied in reaching our decision on the FSC.



## Legal concerns raised in consultation responses

4.12 A number of consultation respondents raised concerns about our proposed application of the legal framework. In particular, the following legal themes emerged from the consultation responses:

- (a) compliance with the Access and Management Regulations;
- (b) our balancing of our statutory duties, including whether we are giving appropriate weight to the “Secretary of State for Transport Guidance to the Office of Rail Regulation” dated July 2012<sup>52</sup> and “The Scottish Ministers’ Guidance to the Office of Rail Regulation” dated July 2012<sup>53</sup>;
- (c) our identification of market segments; and
- (d) whether the levying of the charge would be consistent with competition law.

4.13 We deal with each of these in turn below.

### Compliance with the Access and Management Regulations

4.14 In respect of the Access and Management Regulations, various stakeholders were concerned that our proposals were discriminatory in that we were proposing to levy the mark-up on some market segments but not others. We do not agree that it is discriminatory to treat differently segments of the freight market, which have varying elasticities and compete to differing extents with road and therefore have different impacts on the environment, society and the economy. Moreover, we consider that the Access and Management Regulations envisage that market segments may be treated differently, notably so that those market segments that can pay at least the cost that is directly incurred as a result of operating the railway service are not excluded from use of the infrastructure.

4.15 We also received a number of comments suggesting that our proposals had not taken proper account of paragraph 2(2) of Schedule 3 of the Access and Management Regulations<sup>54</sup>. We do not agree that this is the case. Many respondents thought that setting the amount of the charge being levied according to a certain forecast percentage decrease in freight demand did not comply with this test. In our proposals to levy a FSC and in our decision (paragraphs 4.124), we have considered this requirement. We think that this test is set at a high level and “exclusion” means more than simply some reduction in demand. In any event we have revised our approach in formulating the mark-up from that which we consulted on and we set this out below. We do, however, agree that our statutory duties overlay this test and therefore in deciding whether a mark-up is appropriate and at what level, we have applied and balanced our section 4

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<sup>52</sup> Secretary of State’s Guidance to the Office of Rail Regulation, July 2012

<sup>53</sup> [http://www.transportscotland.gov.uk/files/documents/rail/rail2014/The\\_Scottish\\_Ministers\\_Guidance\\_to\\_the\\_ORR\\_July\\_2012.pdf](http://www.transportscotland.gov.uk/files/documents/rail/rail2014/The_Scottish_Ministers_Guidance_to_the_ORR_July_2012.pdf)

<sup>54</sup> Which requires that the effect of any mark-up “must not be to exclude the use of infrastructure by market segments which can pay at least the cost that is directly incurred as a result of operating the railway service, plus a rate of return which the market can bear.”

duties. We have used our judgment to balance them and to attach an appropriate amount of weight to them.

### **Balancing our Statutory Duties and taking account of the Guidance**

4.16 A number of stakeholders suggested that, in arriving at our proposals for a FSC, we failed properly to balance the various duties to which we are subject. In particular, certain stakeholders expressed the view that we have given undue weight to the duties to promote efficiency and economy on the part of persons providing railway services<sup>55</sup> and to the desirability of reducing the financial burden on the Secretary of State<sup>56</sup>, at the expense of the duties to promote the use of the railway network<sup>57</sup> and to enable persons providing railway services to plan the future of their businesses with a reasonable degree of assurance<sup>58</sup>. In addition, various stakeholders suggested that we have not had due regard to the guidance we received in July 2012, from the Secretary of State for Transport and separately from Scottish Ministers.

4.17 We do not agree that this is the case. In arriving both at our proposals, on which we consulted, and our decision, which is set out below, we have considered all of our statutory duties and identified those that we think are relevant. Of the duties which we consider to be relevant, we have used our judgment to balance them and to attach an appropriate amount of weight to them.

4.18 Specifically as regards the guidance we have received from both the Secretary of State and Scottish Ministers, it is clear from the wording of our section 4 duties<sup>59</sup> that we are not bound by the guidance but are required to take it into account in the overall balancing of all our statutory duties, which we have done.

4.19 The Secretary of State's guidance has a section dedicated to freight. Paragraph 32 refers to the Government's desire to "facilitate the continuing development of a competitive, efficient and dynamic rail freight industry"; paragraph 33 refers to "the importance of sustaining efficient and commercially predictable network-wide freight operations". There are also other paragraphs in the guidance which are relevant to our proposed policy, including paragraph 4 which states that the Secretary of State wants the railway to become more financially sustainable and wishes ORR to support the Government in requiring the rail industry to reduce dependency on public subsidy and to improve value for money for customers. We consider that the levying of a FSC which is more reflective of costs incurred by freight and assists in reducing the dependence of the railway on subsidy is consistent with the Secretary of State's guidance.

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<sup>55</sup> section 4(1)(c) RA1993

<sup>56</sup> section 4(5)(c) RA1993

<sup>57</sup> section 4(1)(b) RA1993

<sup>58</sup> section 4(1)(g) RA1993

<sup>59</sup> Section 4(5)(a) and 4(5)(aa) RA 1993

4.20 In the guidance we received from Scottish Ministers, there are two paragraphs devoted to rail freight<sup>60</sup>. The first, paragraph 21, refers to the importance of rail freight to Scotland's economy and states that the ORR should pay "due consideration to any changes in policy which may impact that network";

4.21 The second paragraph, paragraph 22, sets out the Ministers' expectation that, when developing access charges, ORR should "use a mechanism which recognises the impact that freight operators have on the network but maintains the attractiveness of rail to freight customers, and which is adaptable to prevent the outputs of business in Scotland from becoming uncompetitive in key markets". Whilst a FSC is a mechanism which recognises the costs that freight operators impose on the network, we accept that this guidance could be interpreted as being geared towards the protection of Scottish industry. However, we note that this is expressed in very general terms. In addition, the guidance is just one of the considerations to which we need to have regard. We have sought to address this aspect of the Scottish Ministers' guidance by seeking to understand, both through desk research and analysis and through engagement with stakeholders, the impacts of policy options on the competitiveness of Scottish industry. We have used this assessment when weighing our duty regarding guidance from Scottish Ministers and balancing it against our other duties in order to conclude on the policy.

### **Identification of market segments**

4.22 A number of respondents agreed that it is appropriate for us to retain the existing definitions of particular categories of rail freight commodities (as used in PR08) as separate market segments. However, we also received comments that, because the Access and Management Regulations do not specify how a "market" is defined, we should consider the wider impacts of our proposals, such as the effect on relevant third party markets e.g. the provision of port services, when assessing market segments. We have considered wider impacts where there are clear links to the rail specific issues that we are considering e.g. the extent to which the market for coal affects demand for coal haulage by rail but do not consider that the wider impacts of our proposals in general are relevant to our identification of market segments because, as wider impacts, they are almost by definition distinct from them.

4.23 In addition, a number of stakeholders considered that our identification of market segments neither captured the biomass market correctly nor took into account the fact that biomass is intrinsically linked to ESI coal. On the basis of the evidence we have received, we consider that biomass should be treated as a market segment in its own right, but are also persuaded that there is merit in not treating it differently from ESI Coal because it is intrinsically linked to it, as the two both provide means of generating energy. We set out our proposals on biomass in paragraphs 4.64 onwards.

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<sup>60</sup> [The Scottish Minister's Guidance to the Office of Rail Regulation, July 2012](#)

## Compliance with competition law

4.24 Two competition law concerns were raised by consultees. The first was whether the proposed charge could amount to Network Rail abusing its dominant position which would be prohibited conduct as set out in the Competition Act 1998. The second was whether the charge could amount to a barrier to entry into a market and whether this, of itself, could constitute an abuse.

4.25 As regards the first concern we do not agree that Network Rail levying the charge would amount to it abusing its dominant position. For abuse based on discrimination to occur, it would have to be shown that there were “transactions” which are equivalent but that differential treatment of them has led to competitive disadvantage<sup>61</sup>. We do not agree that this is the case in relation to the FSC because it is not discriminatory to treat different types of freight, which have contrasting characteristics and different (own and cross price) elasticities, in different ways.

4.26 We do not think there is any merit in the second concern. Our economic analysis indicates that the charge is justified as removing a subsidy to freight rather than imposing an artificial barrier to freight operators. In any event the charge would apply equally to all actual or potential suppliers of freight services of a particular kind and so would not place any of them at a competitive disadvantage.

4.27 Even if there was any merit in either of the concerns raised, which we do not agree there is, we think it is likely that Network Rail levying the charge would not amount to it abusing its dominant position because there is an objective justification for the charge. This is that the charge has the legitimate aim of improving efficiency of use of the rail network, making charges more cost reflective and hence reducing government subsidy.

## Conclusion on legal framework

4.28 We have identified the following categories of rail freight commodities as market segments: ESI coal, other coal (excluding biomass), biomass, iron ore, metals, construction, petroleum and chemicals, intermodal, automotive, waste, spent nuclear fuel, general distribution, mail and premium logistics, and channel tunnel.

4.29 In reaching our decision as to which market segments should be subject to a mark-up, we have considered whether a mark-up:

- (a) is efficient – to assess this we have undertaken extensive analysis of rail freight demand and the circumstances under which it transfers to road;

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<sup>61</sup> Section 18(2)c Competition Act 1998.

(b) is transparent – we will determine any charge for CP5 as part of PR13 and Network Rail will publish price lists. As with any other track access charges the charges are being developed through consultation and industry engagement;

(c) is non-discriminatory – the charges will be differentiated by market segment not by freight operator. In addition, we are adopting a consistent approach across market segments;

(d) would guarantee optimum competitiveness – we have considered the extent to which the rail freight market segment competes with road freight in identifying which market segments could bear the charge;

(e) would not exclude the use of the infrastructure by the market segment on which the mark-up was imposed – we use our analysis of rail freight demand to identify whether there is a significant risk that a policy proposal could result in the exclusion of the use of the infrastructure by a market segment; and

(f) respects the productivity increases achieved by freight operators, as set out in paragraph 2(3) of Schedule 3 of the Access and Management Regulations.

4.30 We have also considered any proposed mark-up against our statutory duties. In particular, we think the following statutory duties are the most relevant and therefore are the ones to which we have attached the most weight (in no particular order):

(a) to promote the use of the railway network in Great Britain for the carriage of passengers and goods, and the development of that railway network, to the greatest extent that it considers economically practicable;

(b) to contribute to the achievement of sustainable development;

(c) to promote efficiency and economy on the part of persons providing railway services;

(d) to enable persons providing railway services to plan the future of their businesses with a reasonable degree of assurance;

(e) to have regard to any general guidance given to it by the Secretary of State about railway services or other matters relating to railways;

(f) to have regard to any general guidance given to it by the Scottish Ministers about railway services wholly or partly in Scotland or about other matters in or as regards Scotland that relate to railways;

(g) our duty which, in summary, requires us to have regard to the expenditure that is to be incurred by Scottish Ministers; and

(h) to have regard to the funds available to the Secretary of State for the purposes of his functions in relation to railways and railway services.

4.31 We also considered the following statutory duties to be relevant but have attached less weight to them:

- (a) otherwise to protect the interests of users of railway services;
- (b) to impose on the operators of railway services the minimum restrictions which are consistent with the performance of ORR's functions under Part 1 Railways Act 1993 and Railways Act 2005 that are not safety functions;
- (c) to have regard to the effect on the environment of activities connected with the provision of railway services;
- (d) to protect the interests of persons providing services for the carriage of passengers or goods by railway in their use of any railway facilities which are for the time being vested in a private sector operator, in respect of the prices charged for such use and the quality of the service provided;
- (e) to have regard to the interests, in securing value for money, of the users or potential users of railway services, of persons providing railway services, of the persons who make available the resources and funds and of the general public; and
- (f) section 72 of the Regulatory Enforcement and Sanctions Act 2008 which requires us to keep our functions under review and secure that in exercising these functions that we do not:
  - (i) impose burdens which we consider to be unnecessary, or
  - (ii) maintain burdens which we consider to have become unnecessary.

## Unit of the charge

4.32 We consulted on whether the FSC should be a charge per tonnes moved (with the standard units being per thousand gross tonne miles - kg<sub>tm</sub>), because tonnes moved are key driver of infrastructure cost), a charge per tonne (on the basis that it would relate to the willingness to pay of the customer, and therefore in some sense be efficient) or a combination of the two.

4.33 Some respondents considered that levying a charge per tonne moved is more cost reflective than a charge per tonne and should be the preferred approach. We agree with this: a charge that is more cost reflective should incentivise efficiencies more effectively. We share the concern of those that argued that a charge per tonne would be more likely to lead to transfer to road freight on short distance routes.

4.34 A number of respondents, however, considered that a charge per tonnes moved would discriminate against long distance flows, particularly those associated with mines in Scotland. Some respondents suggested that a distance-based charge could cause structural changes in coal traffic routes and affect

competition between different ports and mines. We do not agree that charging on a tonne per mile basis would be discriminatory as it would be applied equally to all and would be cost reflective. We do accept that – like any cost-based charge – it could have a greater effect on some customers (i.e. those that generate more cost) than on others and we have taken the effect of such a charge into account in our consideration of how it might be implemented.

4.35 Certain consultees noted that a distance-based charge is consistent with the current basis of charging, and thus would reduce the complexity and expense associated with introducing the charge. Many respondents were concerned about increasing the complexity and administrative burden associated with the charge, arguing that retaining a simple charging regime is essential if rail freight is to compete effectively with road.

4.36 The reasons above are entirely supportive of our statutory duty to promote efficiency and economy on the part of those providing railway services. We are now concluding that the FSC will be a charge per thousand gross tonne mile.

4.37 The charge is to be levied as a mark-up on the variable usage charge (so, if Network Rail use the same approach as they do for the freight-only line charge, the variable usage charge would be billed inclusive of this charge, but separate prices would be published). The units for both of these charges, for freight services, will be per thousand gross tonne miles (per kg<sub>tm</sub>). The freight-only line charge is currently levied on this basis. By levying the FSC on the same basis as the freight-only line charge<sup>62</sup>, with both treated as a mark-up on the variable usage charge, we have ensured that there will be no additional complexity associated with the charge.

## Rail market analysis

4.38 In this section we set out the evidence we have considered relating to the impact of a charge on rail demand for the goods being transported and rail's competition with road haulage. These are two of the components of our assessment of the policy against the legal framework which we set out in paragraphs 4.28 to 4.31 above. In particular:

- (a) In considering whether the market can bear the charge, we are assessing whether there is a significant risk that the charge could result in the exclusion of the use of the infrastructure by the market segment.
- (b) In considering whether the charge is efficient, we are assessing:

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<sup>62</sup> Although throughout this report we present the freight specific charge and the freight-only line charge as separate charges, they may be published in Network Rail's price lists and contractualised as a single mark-up.

- (i) The elasticity of demand, i.e. how demand for rail freight might fall or rise as a result of higher charges; and
- (ii) The extent to which the market competes with road – because a switch to road may be inefficient (for example through a worsening of road congestion).

4.39 Using this assessment we identify the market segments which are both highly inelastic and face little competition from road and which, in accordance with the legal framework set out in paragraphs 4.28 to 4.31, we consider further in the context of levying a FSC.

4.40 This section is structured as follows:

- (a) We list information sources,
- (b) we present analysis of all market segments and then particular market segments to which we give greater attention:
  - (i) ESI coal
  - (ii) spent nuclear fuel
  - (iii) biomass
  - (iv) other coal
  - (v) iron ore
- (c) on the basis of this analysis, we confirm a subset of market segments that we consider may potentially be suitable for a FSC.

4.41 In the remainder of this chapter, we set out further evidence on wider impacts of the charge, discuss implementation issues and conclude on this policy.

### **Information sources**

4.42 In addition to our own analysis, we commissioned the following studies to inform our May 2012 consultation regarding the potential impacts of a FSC:

- (a) MDST stage 1 report examining the impact of increases in variable charges for forecast traffic in 2018-19 for each commodity group<sup>63</sup>;
- (b) NERA report examining the likely impact of increased track access charges on ESI demand for coal, nuclear fuel and biomass<sup>64</sup>;

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<sup>63</sup> *Impact of changes in track access charges on rail freight traffic - Stage 1 Report*, MDS Transmodal Limited, March 2012. This can be accessed at <http://www.rail-reg.gov.uk/pr13/PDF/mdst-freight-tac-changes-feb2012.pdf>.



(c) MDST stage 2 report considering the impact of significantly larger increases in variable charges VTAC (+£5, +£10 and +£15 per net ktkm) for those commodities that appeared to be the most inelastic from the stage 1 study (ESI coal, biomass, spent nuclear fuels, iron ores and other coal)<sup>65</sup>;

4.43 In response to feedback from consultees, we commissioned further analysis set out in the following reports:

(a) NERA technical note, October 2012, where it repeats modelling options for ESI coal with respect to a revised base coal forecast<sup>66</sup>.

(b) MDST, December 2012, “Analysis of road and rail costs between coal mines and power stations”<sup>67</sup>.

4.44 In addition to the commissioned work from consultants, we also acknowledge the responses to our May 2012 consultation. The consultation responses have informed our decision making process, and many of the points made are discussed in this chapter. While this document sets out our decisions and reasons for those decisions including as appropriate our responses to points raised in the consultation, we will also be publishing a summary of responses made to each consultation question and our view on those responses.

### **Analysis across all market segments**

4.45 As stated in the legal framework section, we have identified the following categories of rail freight commodities as market segments: ESI coal, other coal (excluding biomass), biomass, iron ore, metals, construction, petroleum and chemicals, intermodal, automotive, waste, spent nuclear fuel, general distribution, mail and premium logistics, and channel tunnel.

4.46 As we explained in our consultation, we asked consultants MDST to forecast the impact of changes in track access charges on rail freight traffic volumes in 2018-19. We used its analysis as a means to filter the number of market segments for which we would consider levying a new charge.

4.47 In accordance with the legal test for a mark-up set out at paragraph 4.28 onwards above, to assess whether it would be efficient to apply a mark-up, we researched elasticity in each market segment and propensity to switch to road. Our further analysis was restricted to those market segments which are both highly inelastic and face little competition from road. We consider our approach is proportionate and

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<sup>64</sup> *The impact of changes in access charges on the demand for coal*, NERA, May 2012. This can be accessed at <http://www.rail-reg.gov.uk/pr13/PDF/nera-coal-report-may-2012.pdf>.

<sup>65</sup> *Impact of changes in track access charges on rail freight traffic - Stage 2 Report*, MDS Transmodal Limited, July 2012. This can be accessed at <http://www.rail-reg.gov.uk/pr13/PDF/mdst-freight-tac-changes-jul2012.pdf>.

<sup>66</sup> We have published NERA's technical note together with this conclusions document. *The Impact of changes in access charges in the demand for coal: update to NERA May 2012 assessment*, NERA October, 2012

<sup>67</sup> We have published MDST's technical note together with this conclusions document. *Analysis of road and rail costs between coal mines and power stations - report by MDS Transmodal*, December, 2012.

consistent with the legal framework, the approach we adopted in relation to freight-only lines in PR08 and our statutory duties.

4.48 On this basis we conducted further research on the impacts of higher charges on the five market segments which are highly inelastic and which also face little completion from road haulage - namely:

- (a) ESI coal,
- (b) biomass,
- (c) "other coal",
- (d) spent nuclear fuel and
- (e) iron ore.

4.49 Our assessment with respect to each of these market segments is set out below.

### **ESI coal**

In this section we discuss the analytical work undertaken to understand the impacts of a FSC on electricity generation and on rail's competition with road.

In assessing the impact of a FSC on ESI coal, our consultants NERA modelled both the impacts on the electricity supply industry (ESI), where coal competes with other fuels including gas, and the transport impacts (MDST). We felt it appropriate to undertake detailed modelling of the ESI because it was relevant to three of the commodities we were assessing (ESI coal, biomass and nuclear fuel) and because stakeholders had argued that ESI coal faced strong competition from gas.

#### *Impact on the electricity supply industry*

4.50 NERA modelled the impacts of higher charges on demand for coal with its electricity market model. The model confirmed our previous understanding (e.g. from PR08) that a substantial increase in track access charges would have little impact on demand for coal.

4.51 We discussed the findings in our May consultation. We received a number of detailed comments on the modelling work, some of which NERA addressed prior to finalising its report. A number of concerns related to NERA's base case forecast (i.e. the forecast of coal in the absence of a FSC). In particular, NERA's forecast of ESI coal in later years was substantially higher than that of DECC. One of the reasons for this was that NERA used coal and gas price forecasts from a different source (Bloomberg). To address these concerns, we asked NERA to prepare a revised base case using price assumptions consistent with those of DECC, and re-model impacts. NERA has prepared a technical note (see footnote 53) setting out differences between its forecasts and those of DECC, and how this affects the impact of the charge on demand for coal. Under its revised forecasts, demand for coal remains quite insensitive to the FSC, for

example levying an additional charge of £5 per thousand net tonne km (equivalent to a FSC, excluding freight-only line costs, of £4.00 per thousand gross tonne miles) reduces demand for coal in each year of CP5 by between 1% and 5%.

4.52 A number of consultees noted that NERA did not model changes in transport patterns. We asked MDST rather than NERA to model transport patterns. The transport patterns have limited impact on the price of delivered coal (because an increase in the price of longer distance flows could generate substitution of shorter distance flows), and so while transport patterns are important for understanding the distribution of impacts, they are of limited relevance to NERA's modelling of the electricity supply industry.

4.53 Some comments related to the extent to which NERA's modelling took into account impacts of EU Directives (which NERA modelled as endogenous investment decisions, i.e. whether to invest in reducing emissions or to limit and / or cease generation), or other factors. More generally, several consultees noted that the ESI coal sector will also be undergoing regulatory changes over the coming years and were unclear how we could accurately assess the impact of the charge on this sector. Overall, there is broad consensus that future demand for coal is subject to high levels of uncertainty, due to a large number of factors such as level of uptake of renewables and movement of international gas prices. We have taken this into account by asking NERA to model several base coal forecasts (in their original report and revised note), and we have found that in each case the FSC has little impact on demand for coal.

#### *Impacts on levels of road haulage*

4.54 We asked MDST to model the impacts of a FSC on transporting ESI coal. In its stage 2 report<sup>68</sup>, MDST modelled both the potential for flows to switch to road and also the potential for different ports to be used and mines to vary output (as, stakeholders have explained, mines tend to operate at 100% or not at all, this would take the form of changes to decisions about whether to invest in new mines or potentially early mine closures). In its subsequent note "analysis of road and rail costs between coal mines and power stations", MDST sets out the relative competitiveness of the two modes with respect to mines in Scotland.

4.55 We explained in our consultation that we considered MDST's modelling of mine and port responses to the charge, in its stage 2 report, to be illustrative rather than definitive forecasts because the parameters used were derived from industry knowledge rather than calibration of actual behaviour. This contrasts with MDST's modelling of road and rail competition for particular journeys, for which MDST has used its well established and calibrated GB Freight Model. It is the shift between road and rail that is particularly important in assessing external costs and benefits. Shifts between rail and shipping do not raise the same issues.

4.56 MDST's modelling of road competition focused on mines in Scotland which are not rail connected. All ports handling ESI coal are rail connected, and some mines are also rail connected. In its technical note,

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<sup>68</sup> See note 63

MDST explained why for such flows, competition from road would not be a realistic proposition. This is consistent with our own understanding of the market segment and with the feedback we have received from stakeholders, who have argued that there may be transfer of traffic to road from certain mines in Scotland that are not rail connected (i.e. which already use road to transport coal to a rail connection and which could therefore more easily use rail for the whole flow).

4.57 Competition with road is highly restricted because many mines and power stations have restrictions on transportation by road. For example, East Ayrshire Council (where around half of the mines in Scotland are located) encourages the use of existing railheads and the construction of new railheads, and states that the exploitation of sites without firm proposals to use rail would not be acceptable<sup>69</sup>. It also seeks to mitigate the effects of road freight (primarily transporting to railheads) by measures including operators paying for remedial works on roads.

4.58 In addition, the costs of transporting by road over longer distances are uneconomic<sup>70</sup>. Respondents to our consultation did not argue that longer distance journeys were at risk from transfer to road, but we did receive a subsequent submission from the Freight Transport Association that suggested that road would be cheaper even on long distance flows if the FSC were £8 per kgkm<sup>71</sup>. The FTA's analysis was very much at odds with MDST's analysis, which sets out why assumptions concerning availability of return loads appear unrealistic.

4.59 In MDST's database of freight journeys, around 5% of tonnes lifted are from mines in Scotland that are not rail connected<sup>72</sup>. (The precise proportion varies because coal demand is highly volatile, though domestic output has been stable.) Of this, 87% is transported to power stations via a railhead (0.7% of tonnes lifted across the GB network). With a £5 per ktkm charge (equivalent to £4 per kgkm FSC), MDST forecasts using its calibrated GB freight model that this share falls to 84%. The associated disbenefit (of the order of £130,000 a year<sup>73</sup>) is more than offset in MDST's forecast decrease in mine output (of 10%), with an associated reduction in road traffic for those journeys from mine to power station via road and a railhead<sup>74</sup>. We think there are good reasons to suppose that MDST's assessment of impact on mine output might be overstated, as we discuss in the section on mines (paragraph 4.84 onwards). The overall picture however, even on the basis of MDST's analysis is one of a very small impact on road traffic, relative to the size of this market, and it is not clear whether the impact is positive or negative.

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<sup>69</sup> <http://www.east-ayrshire.gov.uk/BusinessAndTrade/PlanningAndBuildingStandards/Planning-LongTermAndAreaPolicies/LocalPlan-Minerals/OpenCastCoalSubjectPlan.aspx>

<sup>70</sup> The reasons for this, and the scale of cost differences, is set out clearly in MDST's technical note "Analysing road and rail costs between coal mines and power stations", December 2012.

<sup>71</sup> Equivalent to £10 per kgkm – the central option tested by NERA and MDST in its stage 2 report.

<sup>72</sup> The rail traffic data, provided by Network Rail, is for the 12 months to September 2011; the road freight data is derived from the Department for Transport's continuing survey of road goods transport (CSRGT). On the basis of this data, 5% of tonnes (not tonne km) of coal delivered to GB power stations comes from mines in Scotland.

<sup>73</sup> This is calculated using DfT's estimate of average disbenefits of 27.3 pence per HGV km.

<sup>74</sup> Our analysis is derived from the data in Table A1.2 of MDST's stage 2 report.

### *Assessment of ESI coal*

4.60 This analysis confirms that demand for ESI coal is highly inelastic with respect to track access charges and that any FSC, in the relevant range that we have tested, would not result in any material increase in road traffic (and may result in a decrease in road traffic). Hence we consider that this market segment may be suitable for a FSC and we consider it further in the remainder of the chapter.

### **Spent nuclear fuel**

4.61 In our consultation we explained that, on the basis of ESI analysis prepared by NERA, we did not expect demand for nuclear energy to change as a result of the charge. On the basis of advice prepared by MDST, we did not expect the charge to impact on tonnes of spent nuclear waste moved by rail (or any switching to road).

4.62 Most respondents agreed, or did not disagree, that an increase in track access charges would not in itself change levels of this traffic and would not result in an increase in road traffic. Magnox and DRS argued, however, that it currently used road and rail, and hence there was already infrastructure to support a move away from rail. We recognise that alternative road infrastructure does exist, and MDST's analysis shows that road haulage is typically cheaper if account is not made of security concerns. But our understanding and the advice we have received is that the decision to transport spent nuclear waste by rail is primarily driven by nuclear security concerns. And these decisions are taken by the bodies best placed to weigh up the significance of those security concerns (so, unlike most rail freight traffic, the disbenefits associated with switching to road are largely internalised in the decision-making and the economic case for subsidy through lower track access charges is much weaker).

4.63 On the basis of our consultants' analysis, the responses we have received, and the percentage increase in charge being considered, we do not consider transfer to road to be a material consideration for this market segment. Hence we consider that this market segment may be suitable for a FSC. We therefore consider it further in the remainder of the chapter.

### **Biomass**

4.64 Our consultants MDST and NERA provided us with advice on the emerging market of biomass as a fuel for the ESI, the prospects of future traffic using rail and the subsidy regime. We presented a summary of this evidence in our consultation, and received much additional information from stakeholders in response. Given its status as an emerging market segment, for which at the time of the consultation the subsidy regime was not fully defined, we consulted on delaying our decision on whether to levy a charge on biomass until after PR13.

4.65 A number of consultees considered that while the biomass market is still in the early stages of development there is merit in not levying any freight-specific charge on this market segment. Many

respondents, however, considered that simply deferring the decision will add further uncertainty to the business case for biomass-related investment at ports, power stations and on the railways. Consultees explained to us that investments made now would be subject to the existing subsidy regime on an ongoing basis whereas we had assumed that the recalculation of its credit (subsidy) regimes (from 2017 for England and Wales) would apply to all subsidies. Consultees wanted certainty with respect to the charging regime in order to inform imminent investment decisions.

4.66 We are therefore concluding that we will decide whether to levy a FSC on biomass as part of PR13 (rather than delaying the decision beyond PR13).

4.67 We have been persuaded by consultees that we should consider further whether biomass, as a fuel for electricity generation that can be burnt in converted coal fired power stations, should be subject to track access charges on the same basis as ESI coal, to prevent the market for ESI fuels from being unduly distorted. Hence we consider that this market segment may be suitable for a FSC and we consider it further in the remainder of the chapter.

### **Other coal**

4.68 In our consultation, we explained that this category consisted of coal that is used as a fuel for a variety of industrial purposes (excluding ESI), including the production of steel and cement. Our consultant MDST provided advice on this market segment as part of its Stage 2 report. It considered that for certain journeys, rail freight faced strong competition from road, including supply of coal for cement works, and road haulage was already used. The implication was that for particular other coal traffic flows, increased track access charges would lead to a significant transfer of traffic to road.

4.69 A number of consultees have provided additional information to support the advice provided to us by MDST. For example, RFG argued that the cement market, whilst increasing its use of rail, is highly price sensitive to road and changes in any aspect of rail costs could compromise the viability of increased rail use across the supply chain.

4.70 We have considered carefully the consultation responses we have received and we accept that rail faces substantial competition from road haulage for a significant number of flows in this market segment. Competition with road haulage, and transfer to road, is a key consideration of whether a mark-up would be efficient, as set out in the legal analysis at from paragraph 4.28. As we do not think it would be efficient, we have decided not to apply the FSC to other coal traffic.

### **Iron ore**

4.71 We explained in our consultation that iron ore traffic currently consists of one flow that is captive to rail (MDST's analysis suggests that road transport is around three times the cost of rail transport). An option to

increase track access charges by £5 per ktkm would increase the cost of iron ore by around 0.2%, translating in to an increase in cost of steel equivalent to less than 0.1%.

4.72 TATA Steel argued that levying a FSC on iron ore as a single flow represents a tax on a particular operation. We do not agree. The charge, as proposed, represents a reduction in the subsidy from which users and operators of that flow are currently benefitting rather than a tax. And the same rationale for reducing this subsidy applies to iron ore as to other commodities where we consider there to be a low propensity to switch to road.

4.73 Although iron ore is a single flow, it has consistently been treated as a separate market segment for the purpose of setting track access charges (and this is the case for the current variable usage charge price list). Historically this market segment has borne higher track access charges, and the variable usage charge now is around 35% less in nominal terms for iron ore than it was in 2002<sup>75</sup>.

4.74 Stakeholders argued that we needed to consider the combined effect of a FSC on iron ore and on other coal (given that TATA Steel transports coal extensively by rail). Iron ore is a relatively small component of TATA Steel rail traffic. Cost of steel production would be relatively more affected by changes to the variable usage charge and a FSC levied on industrial coal. As explained in chapter 2, we are seeking to give rail freight customers assurance by providing an early cap on the variable usage charge. TATA Steel will also benefit from our decision not to apply a FSC to coal other than ESI coal.

4.75 We recognise that this industrial sector is experiencing very difficult economic conditions which are affecting business decisions, with respect to investment for example. However, our analysis shows that the market is inelastic and the impact of a charge set at the level of the caps announced in this document is sufficiently small that it is reasonable to assume it would be a very small factor in any such decisions, and so the charge would not result in this market segment being excluded. In addition, the traffic does not compete with road. Hence we consider that this market segment may be suitable for a FSC and we consider it further in the remainder of the chapter.

### **Concluding on rail market analysis**

4.76 Although we consulted on levying a charge on “other coal” (i.e. non-ESI coal), having considered carefully consultation responses and revisited analysis and other evidence, we have concluded that the competition from road is significant enough in this market segment for it not to be efficient to levy the charge on this market segment.

4.77 We will consider in the remainder of this chapter whether a FSC should be applied to ESI coal, iron ore and spent nuclear fuel.

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<sup>75</sup> Source: ORR analysis of price lists.

4.78 To increase certainty for investors, we will conclude our position on a potential charge for biomass during PR13 (we had consulted on delaying the decision beyond PR13) on the same basis as that for ESI coal. We will consult further on biomass separately.

4.79 We will not levy a FSC on other rail freight market segments because, as set out in our consultation and supported by the responses we have received, we have concluded that it would not be efficient, and hence in accordance with the legal framework, to do so.

## **Understanding the wider impacts of a charge**

4.80 In our consultation, we explained how a FSC might impact on the price of delivered coal and on electricity prices, if passed down the supply chain in full. We discuss these impacts later in this section. We also asked NERA to consider the impact on mines in Scotland.

4.81 A number of respondents said we have not considered the wider impacts of our proposals sufficiently. To address this, we have consulted extensively with stakeholders and conducted further analysis, including an analysis of the costs and benefits of levying a FSC. We set out our assessment in this section, focusing on the three market segments that we identified through our rail market analysis as being potentially suitable for a charge, namely ESI coal, spent nuclear fuel and iron ore. Any FSC on biomass would be subject to a separate consultation.

4.82 We think it is good practice to consider the wider impacts of a policy, for example because it makes the implications of the policy more transparent and may allow unintended consequences to be mitigated. We have also received guidance from Scottish Ministers to consider whether any charge would prevent the outputs of any business in Scotland being competitive in key markets. One of our statutory duties requires us to have regard to this guidance when concluding on this policy.

4.83 We structure this section as follows:

- (a) Impacts on domestic coal mines;
- (b) Wider impacts in relation to spent nuclear fuel;
- (c) Impacts on electricity customers;
- (d) Impacts on other parts of the ESI supply chain, including ports and generators;
- (e) Impacts for steel industry;
- (f) Impacts on freight operators;
- (g) Overall impacts (cost benefit analysis).



## Domestic mines

4.84 In response to our consultation, we have received extensive representation from producers of coal in Scotland, in particular. We have sought to engage with stakeholders to ensure that we understand the issues, and take them into account where appropriate, in our policy conclusions.

4.85 Stakeholders have argued strongly that mines in Scotland are in a difficult financial position and are not able to absorb additional charges. It is clear that some mines are currently facing severe financial difficulties. For example ATH Resources went into administration in December 2012<sup>76</sup>, citing financial difficulties associated with the sharp fall in international coal prices as being a key factor.

4.86 Almost all ESI coal is transported to power generators by rail, but NERA's analysis suggested that a charge would only result in a small fall in demand for coal. Mines would be affected to the extent that the charge could result in competitive disadvantage relative to imported coal, and this would occur with a distance-based charge for some of the mines located further from power stations. This is particularly the case for coal produced in Scotland supplying English power stations (rather than intra-Scotland journeys for example). One source states that around 1,500 people are employed directly in mining in Scotland<sup>77</sup>, with 300 being employed by ATH.

4.87 In our consultation we explained that there were good reasons to suppose that, while the charge would affect the financial position of mines, it would not necessarily affect their output, at least in the short term. This because ongoing costs for open cast mining are low relative to initial investment, and, consistent with that observation, domestic coal production volumes have been fairly stable in recent years despite highly volatile international prices. However, the charge may affect levels of investment in future mines. Stakeholders have argued that the charge would affect levels of production, citing the current financial difficulties referred to above.

4.88 MDST, in its stage 2 work, assumed that mines partially absorb the differential costs of the FSC. In its indicative analysis a £4 charge per kg<sub>tm</sub> resulted in a 10% fall in output from mines in Scotland. Several stakeholders argued that the modelling was flawed because constraints, including capacity constraints at ports and rail infrastructure constraints, had not been taken into account. The implication of this is that the fall would be less than that modelled by MDST (on which see paragraph 4.54 above). Over the longer term, however, we would expect the significance of such constraints to be reduced (because coal demand is forecast to fall, and because investment may overcome some constraints).

4.89 A FSC of £4 per kg<sub>tm</sub> (equivalent to £5 per k net tonne km) would disadvantage journeys from Scotland to power stations in England, relative to coal imported using ports in England, by around £1.50 per tonne (around 3% of the price of delivered coal). A much larger determinant of domestic coal's

<sup>76</sup> Details at [www.ath.co.uk](http://www.ath.co.uk); also BBC report: <http://www.bbc.co.uk/news/uk-scotland-scotland-business-20617306>

<sup>77</sup> Source; Roger Tym & Partners for the Scottish Mining Industry Commission.

competitive position, however, is the international coal price, because domestic coal competes primarily with imports. This price is highly volatile; for example in October 2012 it was 30% lower than at the start of the financial year. We note this in the context, particularly, of the guidance we have received from Scottish ministers concerning the competitiveness of businesses in key markets, which we need to balance against our other statutory duties.

### **Spent nuclear fuel**

4.90 We consulted on levying a FSC on spent nuclear fuel. Respondents argued that setting this charge would not result in a reduction in overall government subsidy because it would simply result in the Nuclear Decommissioning Agency (NDA), a public body, paying higher charges through its subsidiary to freight operator Direct Rail Services (DRS). To the extent that this is the case, we think that the charge would still be beneficial because it would improve transparency regarding the source of the costs, namely the nuclear industry (which we understand to be in large part legacy costs) rather than costs to rail.

4.91 In practice, it is not clear to us that the charge would simply result in a transfer of subsidy, because there may be scope within commercial contracts to pass on some charges to a commercial generator. Indeed our consultant NERA has argued that nuclear generators would benefit financially from the FSC because their margins would increase as a result of the higher price of delivered coal.

### **Electricity customers**

4.92 On the basis of NERA analysis, we estimate that a £4 per kgm FSC for ESI coal would result in around a 0.1% increase in domestic users' annual electricity bills, or less than £0.50 a year. This change would mean that electricity customers would be paying more cost reflective charges.

4.93 We would not expect a track access charge on spent nuclear fuel traffic to result in a change to electricity customers' bills because nuclear is not the marginal fuel (by which we mean that the cost of an extra unit of electricity from nuclear power is much less than that for gas or coal), and hence does not set electricity prices.

### **Other parts of the ESI supply chain**

4.94 Certain businesses in the ESI supply chain would be directly affected by a distance-based charge, in particular businesses associated with longer distance flows, who thereby impose greater costs on the rail infrastructure per tonne of coal (or other fuel) delivered but whose current charges do not reflect this differential.

4.95 The two main examples of this of which we are aware are:

(a) Clydeport, the owners and operators of Hunterston deep water terminal (which handles coal and employs 90 people). Around 40% of coal traffic at Hunterston is to English power stations<sup>78</sup>; and

(b) Fergusson Group Ltd, a UK wide supplier of solid fuels to the household, industrial and the power generation sectors.

4.96 Both entities have responded to our consultation arguing strongly against the charge.

4.97 MDST modelled that around 22% of the coal traffic would be lost from Hunterston port as a result of a £4 per kgtm charge. This is consistent with our understanding: average length of haul for ESI coal increased significantly following major reductions in track access charges in 2002, and we would expect an increase in charges to reduce the incidence of longer journeys. This is a possible impact of making charges more cost reflective, with associated gains in efficiency in use of the rail network.

4.98 A longer transition period for the implementation of the charge would allow businesses more time to adapt efficiently, and we consider the case for phasing in the charge in the next section.

### **Steel industry**

4.99 We explained in our consultation that iron ore traffic currently consists of one flow that is captive to rail (MDST's analysis suggests that road transport is around three times the cost of rail transport). An option to increase track access charges by £5 per ktkm would translate into an increase in cost of steel of less than 0.1%<sup>79</sup>.

4.100 We recognise that this industrial sector is experiencing very difficult economic conditions which are affecting business decisions, with respect to investment for example. However, our analysis shows that the impact of a charge set at the level of the caps announced in this document is sufficiently small that it is reasonable to assume it would be a very small factor in any such decisions.

### **Rail freight operators**

4.101 It is relevant for us to consider the impact of the policy on commercial freight operators to the extent that this impacts on competition and hence on customers. We also have a statutory duty to allow rail operators to plan their businesses with a reasonable degree of assurance.

4.102 The freight operators have argued that their profit margins are such that they would be unable to bear the charge. The implication of this is that they would either pass on the charge to their customers (or other parts of the supply chain) or change the mix of services that they offer.

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<sup>78</sup> This proportion is taken from MDST analysis of 2011 data.

<sup>79</sup> Analysis taken from MDST Stage 2 report.

4.103 We have received representations, for example from DB Schenker and from Freightliner, regarding the scale of the charge on which we consulted and its implications for their operations. In particular they have argued that the charge could prompt restructuring of the portfolio of services offered and highlighted the impact of a forecast decline in ESI coal traffic (due to energy policy irrespective of the level of track access charges) on rail freight.

4.104 A FSC, depending on its size, may potentially have significant impacts on ESI coal tonnes moved (though only marginal impact on ESI coal tonnes lifted). Freight operators and the rail infrastructure already handle substantial volatility in this traffic (for example the tonnes moved in 2011-12 for coal was 18% higher than that in 2010-11). Nevertheless, a longer transition period for the implementation of the charge would allow businesses more time to adapt efficiently, and we consider the case for phasing in the charge in the next section.

### **Assessment of impacts overall**

4.105 In response to concerns that we have not given sufficient consideration to wider impacts, we have undertaken a cost benefit analysis of the FSC.

4.106 For spent nuclear fuel and for iron ore we do not expect the imposition of a FSC to result in changes in behaviour. In such instances, the charge represents a transfer of funds (with a ratio of benefits to costs of one). This represents better value for money to the extent that the subsidy saved is returned to the taxpayer or is spent in a targeted way on something that delivers a higher cost benefit ratio (for example, the Initial Industry Plan set out the business case for investment in freight enhancements from Felixstowe to Nuneaton delivering a benefit to cost ratio of two). To the extent that it would simply result in a transfer of subsidy (as previously noted, respondents have argued that the additional charge for spent nuclear fuel would be borne in full by the Nuclear Decommissioning Agency, though it is not clear to us that this would be the case) the net benefit of the charge would be limited to greater transparency regarding the source of the subsidy.

4.107 In the case of ESI coal, we expect a FSC to result in changed behaviour, in particular to rationalise some of the longer journeys by switching to ports closer to power stations. These changes would deliver savings in infrastructure costs. However they would also result in disbenefits to those entities changing behaviour as a result of the charge.

4.108 We know that for each individual journey the disbenefits are greater than or equal to zero (otherwise they would have switched prior to the introduction of the charge), and they are less than or equal to the charge (otherwise they would simply pay the charge). By applying these insights, it is standard practice in transport appraisal to assume that on average the disbenefits per trip are half the value of the charge (the “rule of a half”). Hence, by forecasting the impact of the charge on demand, the total disbenefits can be calculated. Note that all disbenefits in normal functioning markets are accounted for in this approach,

including disbenefits associated with stranded assets. Only disbenefits associated with distorted markets – for example associated with high levels of structural unemployment – are not accounted for in this methodology, and they are discussed separately in the context of mining.

4.109 Our cost benefit analysis is set out in Annex B. Overall, it shows that the benefit cost ratio of the current regime, as compared with a FSC, is close to one. This represents poor value for money as compared with other options for subsidy, and provides support for the case for implementing a FSC.

## Implementing the charge

4.110 In this section, in accordance with the legal framework that we set out in paragraph 4.28-4.30, we consider whether and how to implement the FSC. We take account of our rail market assessment and, where relevant, assessment of wider impacts. In particular we:

- (a) Conclude on our consultation proposal that the charge be set with reference to the expected impact of the charge on demand;
- (b) Set out how we are treating the evidence on FACs; and
- (c) Assess the case for phasing in the charge.

### Consultation on setting the charge on the basis of forecast impact on demand

4.111 We consulted on whether we should set the charge for each market segment below the level of FACs allocated to that segment<sup>80</sup> if there was a forecast reduction in demand of more than a certain percentage (dependent on the extent of competition with road), and we suggested that the percentage may be between 5% or 10%. This was a way in which we could have adjusted the level of the charge to take into account expected effect. We considered this proposal on the grounds that it achieved an appropriate balance of our statutory duties, in particular our duty to promote the use of the railway for the carriage of goods, and our duty to have regard to the funds available.

4.112 Many of the responses to this proposal related to concerns about how limiting the charge in this way would be implemented. We proposed that such a limit be based on forecast demand, applying to all market segments. It would be used to determine charges as part of PR13, i.e. in advance of CP5. But there was confusion as to whether some market segments would not be subject to this limit and whether it would be recalculated annually on the basis of outturn traffic. To clarify, we proposed that it would apply to all market segments and intended that it would not be recalculated annually.

4.113 Some respondents were concerned as to how any such limit would be determined given uncertainties in forecasts. We agree that it is difficult to forecast changes in tonnes moved as a result of

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<sup>80</sup> The method of allocation, and associated cost estimates, are set out in chapter 3.

the charge because choice of port, for example, may change. Forecasts of changes to tonnes lifted are more robust, and Network Rail advocated setting such a limit with reference to the latter.

4.114 A number of respondents argued that the level at which we limited the charge (which we set with respect to the level of volatility of demand ordinarily experienced by freight operators in individual market segments) was arbitrary. RWE argued that any such limit undermined the principle of cost reflective charging.

4.115 Several respondents argued that limiting the charge by reference to the effect on demand was at odds with the legal framework. We do not agree with this assessment and explain our reasoning earlier in this chapter (paragraph 4.15).

4.116 Having listened to consultees' views, we have decided not to use forecast impact of the charge on traffic as a basis for determining the FSC, and to balance our statutory duties by other means. Instead we have approached formulating the charge on a different basis, which we set out below

### **Setting a cap on a FSC with reference to the evidence on FACs**

4.117 We consulted on setting a cap on a FSC well in advance of our final determination. We recognise that this is important for giving the rail industry and wider supply chain assurance regarding the level of charges for the next control period.

4.118 The responses we have received to our consultation and the engagement we have had with stakeholders lead us to think that there are considerable benefits, in terms of industry confidence with respect to planning and investment, in setting an early cap on this charge and that the value of the cap diminishes considerably if it is set at an artificially high level.

4.119 In chapter 2 we explained that it is not typical for regulators to give early certainty in the form of a cap on charges and it is difficult to do so because we do not yet know for CP5 what Network Rail's efficient costs will be. We sought to balance these constraints with the desire of the freight operators and their customers for early certainty, by setting a cap on the variable usage charge (which is required to be based on costs directly incurred) with an allowance for 15% above the best estimate of costs.

4.120 The point of a mark-up is to enable the infrastructure manager to obtain full recovery of its costs, over and above those charged on a "costs directly incurred" basis. This means that, subject to the legal framework being applied, there is some flexibility as to what the mark-up could actually be. We think this uncertainty presents a strong case for early certainty by capping the charge. Having now worked up the estimates of the range of FACs, we think it is appropriate that, when balancing our statutory duties as set out in paragraphs 4.30 and 4.31, we cap the charge with reference to a conservative estimate of FACs, and are therefore concluding that the low end estimate of FACs is used to calculate the cap. This cap is significantly below the range on which we consulted and we consider that, based on our market analysis of

the relevant market segments set out earlier in this chapter, a maximum charge at this level would be consistent with the legal principles set out in paragraph 4.28 onwards.

### Phasing in a specific charge

4.121 It is clear from the consultation responses we have received and the discussions that we have had that the FSC would be a substantial increase in costs for some businesses, and this would necessitate changes that are necessarily easier to introduce over a longer period of time.

4.122 Hence we have considered whether a charge should be introduced in full at the start of CP5 or whether it should be phased in. The main advantage of the former is that the benefits of the charge are realised more rapidly. However, if a change is introduced rapidly, those affected by it have less time to react and the implementation costs will be higher (for example relating to redeployment of staff and incidence of stranded assets).

4.123 By considering the evidence provided by consultees, including, where appropriate, evidence on the wider impacts of the charge, we have concluded that phasing in the level of the FSC over a number of years is an appropriate balance of our statutory duties; in particular it allows businesses time to plan and adapt, and therefore there are efficiency gains associated with phasing in the charge.

### Concluding on a FSC

4.124 Having applied the legal framework set out in paragraphs 4.28-4.31 and in the light of our analysis of market segments set out earlier in this chapter, we have decided to introduce a new charge in CP5 – a ‘FSC’ – for freight services carrying ESI coal, spent nuclear fuel and iron ore. The commodities to which the charge would apply are shown in Table 4.1.

**Table 4.1: Application of FSC to commodities**

	May 2012 consultation	Conclusion
Electricity supply industry (ESI) coal	Yes	Yes
Other coal	Undecided	No
Spent nuclear fuel	Yes	Yes
Iron ore	Yes	Yes
Biomass	Delay decision until after PR13	Make decision as part of PR13, and consult on levying the charge on biomass
Other commodities	No	No

4.125 There are good reasons to subsidise rail freight. This is because there are wider economic and social benefits of moving freight by rail rather than road. Without rail freight, there would have been an additional 6.7 million road journeys in 2007-8. Switching from road to rail reduces CO<sub>2</sub> emissions by 70% per tonne moved and generates benefits in terms of reduced road congestion equivalent to 28 pence per HGV mile avoided. This is why the UK and Scottish governments have consistently supported rail freight, and have funded substantial investments to improve rail freight infrastructure - for example gauge enhancements on the Felixstowe to Nuneaton and Southampton to West Midlands routes to allow large containers to be carried by intermodal traffic and the Grangemouth branch improvement.

4.126 But the wider economic and social benefits that underlie the subsidy to rail freight are generated principally when freight that would otherwise have travelled by road travels by rail. To date, rail freight has benefitted from subsidy, even where, as is the case for ESI coal, spent nuclear fuel and iron ore, it cannot easily or economically switch to road. By introducing a FSC for these commodities, we will increase the extent to which they contribute to the costs that freight causes the rail network, as well as reduce infrastructure costs. And in doing so, we will reduce the overall size of the subsidy that Network Rail receives (through grant directly from government) and the fixed charges paid by passenger train operators.

4.127 Network Rail has provided estimates of the costs that freight imposes on the network ('FACs'), amended according to the recommendations of the independent reporter. Having listened to the views of the industry and its customers during our consultation, we have taken a conservative view and set a cap at our estimate of the low end of the range (£278m a year in total across all commodities).

4.128 Following extensive stakeholder engagement, we have decided it is appropriate that Network Rail phase these charges in gradually over the last three years of CP5 in order to allow businesses time to adapt. The exact level of the charge may change as Network Rail refines its estimates of the costs that rail freight generates on the network (based on best available evidence rather than low-end estimate). But we are now setting a cap on the level of the full charge for each commodity, although Network Rail will consult on the profile of the phasing of the charge. The level of the charge, which will be in addition to the freight-only line charge, will be zero in the first two years of CP5 (2014-15, 2015-16), rising gradually to the full level by the end of CP5 (2018-19). Table 4.2 shows the level of the cap for each commodity in each year of CP5, assuming a gradual introduction of 20% of the charge in year 3, 60% in year 4 and 100% in year 5.



**Table 4.2: FSC cap (per kgkm) and profile through CP5**

	Current track access charges*	FSC cap, 2014-15	FSC cap, 2015-16	FSC cap, 2016-17	FSC cap, 2017-18	FSC cap, 2018-19
ESI coal	£2.83	£0.00	£0.00	£0.80	£2.40	£4.04
Spent nuclear fuel	£9.83	£0.00	£0.00	£2.15	£6.98	£11.64
Iron Ore	£2.28	£0.00	£0.00	£0.59	£1.77	£2.96

\*We show the current charges (variable usage charge, capacity charge, coal spillage charge, freight-only line charge) to allow comparison. The FSC would be additional to these charges. Source: ORR and MDST analysis of price lists and revenue data.

4.129 These caps exclude variable charges and the freight-only line charge<sup>81</sup>. As we explained in chapter 3, Network Rail developed a methodology and estimated the freight-only line charge in March 2012 for ESI coal and spent nuclear fuel. (There is no freight-only line charge for iron ore.) Its estimates are shown in Table 4.3. Network Rail is refining these estimates and calculating unit charges (which, as an existing charge, would not be subject to phasing and would apply to each year of CP5).

**Table 4.3: Freight-only line costs, Network Rail March 2012 conclusions (£m a year)**

Commodity	Central estimate	High estimate (=+15%)
ESI coal	£4.94m	£5.68m
Spent nuclear fuel	£1.27m	£1.46m
Combined	£6.21m	£7.14m

4.130 The introduction of this charge will see rail freight pay a greater contribution to the costs that it imposes on the network. The proportion of Network Rail's costs that the freight sector will pay as a result of FSCs at these levels will clearly depend on our view in PR13 on Network Rail's costs, and on levels of the variable charges, the fixed charges and network grant. But if the freight sector were to pay the full level of

<sup>81</sup> Although throughout this report we present the freight specific charge and the freight-only line charge as separate charges, they may be published in Network Rail's price lists and contractualised as a single mark-up.

these charges it would make a contribution of around 30-35% to the costs it generated in running trains on the network<sup>82</sup>.

4.131 In response to our May 2012 consultation we received many submissions, in particular from those likely to be affected by our proposal to introduce a FSC. We have listened to, understood and taken seriously these concerns. In the light of these submissions, the conclusions set out above differ materially from the proposals on which we consulted in May 2012, specifically:

(a) We have taken a conservative approach in estimating the costs that freight imposes on the network (FACs) and which we seek to recover through the FSC. We consulted on an indicative FSC (over and above the existing freight-only line charge) for ESI coal of £8 per kg<sup>83</sup>, with other commodities being charged on an equivalent basis. We have now capped the charge, net of the freight-only line charge, at £4.04 per kg<sup>84</sup>, £11.64 per kg<sup>84</sup> and £2.96 per kg<sup>84</sup> for ESI coal, spent nuclear fuel and iron ore respectively;

(b) We have decided not to introduce the FSC for any of three commodities until year 3 of CP5, i.e. 2016-17<sup>84</sup>. This will give the affected businesses time to adapt to the charge. In particular it will give the ESI coal industry greater scope to adapt at a time of particular change and uncertainty (for example due to the coming into force of the Industrial Emissions Directive (IED) Directive<sup>85</sup> in 2016 and increasing use of renewables; and

(c) We have decided to phase the FSC in gradually, for example at 20% of its final level in 2016-17, 60% in 2017-18 and 100% in 2018-19 (producing the charges as set out in Table 4.2 above). Again, this will give the affected businesses time to prepare for and adapt to its full impact.

4.132 The final level of charge is ultimately for Network Rail to set, subject to the caps set by us and our audit and approval of the mark-up, in line with Directive 2001/14 and the Access and Management Regulations. In doing this, Network Rail will consult on the exact levels of the charge in each year of CP5, taking into account our decision on phasing.

4.133 We have also decided to consult on introducing a FSC for the haulage of biomass as part of PR13, for CP5. This represents a change in position from our May 2012 consultation document, in which we proposed to make a decision on a FSC for biomass in PR18. We had proposed this on the basis that the market for biomass was emerging, and that it was not yet clear what the market could bear. Consultation respondents told us clearly that they would prefer to know in PR13 whether we would introduce a FSC for biomass, not least as this would provide greater certainty for their forthcoming investment decisions. We

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<sup>82</sup> Source: ORR analysis using costs and charges presented in chapter 3.

<sup>83</sup> This is equivalent to £10 per 1000 net tonne km, as tested as a central option by our consultants NERA and MDS Transmodal.

<sup>84</sup> The freight-only line charge will continue to apply for each year of CP5 on the same basis as that for CP4.

<sup>85</sup> 2010/75/EU

agree with this. We will therefore be consulting shortly on a proposed FSC for biomass, with a view to setting out our provisional view as part of our draft determination in June 2013 and the level of the charge as part of the final determination in October 2013.

4.134 The charges that we will introduce for the haulage of ESI coal, spent nuclear fuel, and iron ore and propose to introduce for biomass, as set out above, reflect the fact that these commodities cannot easily or economically travel by road. Our detailed analysis shows that the introduction of the FSC, phased in as set out above, will not generate a material shift of rail freight to road. Our decision is therefore in line with EU Directive 2001/14, which requires infrastructure costs to be recovered according to their ability to bear higher charges, reflecting among other things the extent to which rail competes with road. Reflecting the greater substitutability of road for rail haulage in respect of other services, we do not plan to levy any such charge on other rail freight services.

## Next steps

4.135 We will shortly issue a consultation on setting a FSC on biomass traffic on the same basis as that for ESI coal traffic. We will also publish a summary of responses to our consultation and our views on the detailed points raised by consultees which are not addressed in this document.

4.136 In advance of our draft determination, in June 2013, we are also asking Network Rail to refine its estimates of FACs, which provide the basis for the final FSCs. In particular, we are asking Network Rail to:

- (a) follow the recommendations of Arup in revising its estimate of variable usage costs (correcting its treatment of non-commercial freight);
- (b) make other refinements proportionate to their impact on the determined charge, in particular allocation of costs associated with the possessions regime (“schedule 4”) with respect to spent nuclear fuel;
- (c) update the unit costs consistent with Network Rail’s strategic business plan (and ultimately our PR13 final determination including efficiency assessment) and other best estimates (rather than low range estimates) of FACs; and
- (d) refine the allocation of variable usage costs and netting off of other variable charges (with updated charge estimates).

4.137 We are also asking Network Rail to consult on the profile of the phasing of the charge.

**4.138 The final level of the charges that Network Rail sets must be at or below the level of the caps we have set out in this document.**

4.139 Draft price lists will be published in conjunction with our draft determination of June 2013, including prices for the FSC.

# 5. Wider work on track access charges and next steps

## Introduction

5.1 In this chapter, we set our conclusions from this document within the wider context of all work on track access charges that form part of PR13, and the direction of travel beyond PR13.

5.2 Network Rail is calculating track access charges in PR13. We outline its work and note some key conclusions to date in PR13 relating to suspension factors, which are an aspect of the variable usage charge, and the capacity charge. And we summarise the work we are expecting Network Rail to undertake to conclude in PR13 track access charges.

5.3 Beyond PR13, we summarise how we intend to work with the Rail Delivery Group (RDG) to establish a programme of work to consider and develop options for improving the structure of charges.

## Network Rail's work on track access charges

5.4 As part of PR13 Network Rail leads on the calculation of track access charges paid by passenger and freight operators, consulting stakeholders, subject to the charging framework and charging rules that we set. We audit the charges that Network Rail has calculated and will set out Network Rail's track access charges for the whole of CP5 in our PR13 final determination.

5.5 The timing of all of Network Rail's consultations on track access charges is shown in Table 5.1. The indented items include components of track access charges that Network Rail has consulted on separately, including initial cost estimates for the variable usage charge which were used in calculating the freight cap in chapter 2 of this document. These elements form part of the overall variable usage charge methodology. Network Rail's draft price lists will be published in conjunction with our June 2013 PR13 draft determination.

**Table 5.1 – Network Rail track access charges consultations as part of PR13**

<b>Track access charge</b>	<b>Network Rail consultation</b>	<b>Network Rail proposal following consultation</b>
Variable usage charge		
- VUC initial cost estimates and freight caps	<b>November 2011</b>	<b>March 2012</b>
- Suspension factors	<b>March 2012</b>	<b>August 2012</b>
- Allocation of the VUC	<b>December 2012</b>	<i>March 2013*</i>
Capacity charge	<b>July 2012</b>	<b>October 2012</b>
Traction electricity & electrification asset usage charges	<b>September 2012</b>	<i>January 2013*</i>
- DC losses	<b>September 2012</b>	<i>January 2013*</i>
Station long term charge	<b>September 2012</b>	<i>June 2013*</i>
Fixed charge	<b>November 2012</b>	<i>February 2013*</i>
Coal spillage charge	<b>December 2012</b>	<i>March 2013*</i>

\*Note: these are forthcoming expected dates

5.6 These consultations can be accessed via Network Rail's PR13 webpage<sup>86</sup>. Also on the webpage is Network Rail's December 2011 paper explaining how it is engaging with its customers with respect to track access charges for PR13. Other than the written consultations, its principal mechanism for doing this is the monthly meetings ("VTAC developments meetings") for which it provides the secretariat, which are chaired by a representative of passenger or freight operators.

5.7 Network Rail's consultations have been informed by consultancy studies that we have scrutinised and in some cases employed independent reporters to audit. Since the end of the capacity charge consultation Network Rail has commissioned consultants to undertake further work to calculate capacity charge prices.

5.8 To date Network Rail has concluded with respect to the estimation of the variable usage charge and freight caps, on which we concluded in chapter 2, on suspension factors and on the capacity charge. We comment on the suspension factors and the capacity charge in the following two sections.

<sup>86</sup> Accessed at <http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/>

## Suspension factors applied to freight variable usage charges

5.9 Our PR08 determination directed Network Rail to develop a more robust methodology to determine suspension factors that are used in calculation of variable usage charge for freight vehicles. Network Rail has conducted work and consulted on a new approach. Suspension factors are the discount or premium paid to reflect the “track friendliness” of the suspension types used by freight vehicles.

5.10 In September 2012 we accepted Network Rail’s revised proposal to calculating suspension factors to be applied to variable usage charges for all freight vehicles registered after the start of CP5<sup>87</sup>. This new methodology deploys the “Ride Force Count” (RFC) metric. Following a further brief consultation, we confirmed Network Rail’s proposal that the RFC methodology will also apply to existing vehicle types (registered before 1 April 2014) that are “opted in” by operators.

5.11 The accepted proposals will produce variable usage charges that better reflect relative track friendliness of different vehicle types and send price signals that incentivise the development of more track-friendly rolling stock, resulting in reductions in industry costs.

## Capacity charge

5.12 The capacity charge was introduced following the Access Charges Review in 2000. The capacity charge reflects Network Rail’s incremental Schedule 8 (performance regime) costs of additional traffic on the network. These costs arise because as the network becomes more crowded it becomes more difficult for Network Rail to recover from incidents of lateness. The capacity charge, if applied at an appropriate degree of disaggregation and assuming other cost-based charges work effectively, means that Network Rail is not financially penalised for allowing additional traffic on the network. It also gives operators price signals regarding the congestion they are causing other vehicles.

5.13 Excluding mark-ups such as the freight-only line charge, all variable track access charges are set to reflect the marginal cost of a change in traffic. One consequence of this is that revenues that Network Rail receives from variable charges do not necessarily equal the costs that it incurs as a result of the traffic as a whole. In the case of the capacity charge, applying the correct charge at the margin leads to an over-recovery of associated costs; for some other variable charges (for example, as we have seen in chapter 3, the variable usage charge), it leads to an under-recovery of costs. We consider this to be the correct approach, firstly, because it sends the correct pricing signals to Network Rail, train operators and funders to incentivise behaviour at the margin, and, secondly, because it is consistent with the general principle of EU Directive 2001/14 and the Access and Management Regulations that, unless an exception applies, charges must be set to recover costs that are directly incurred.

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<sup>87</sup> Our conclusions letter on suspension bands is available here: [www.rail-reg.gov.uk/pr13/PDF/vuc-suspension-bands-240912.pdf](http://www.rail-reg.gov.uk/pr13/PDF/vuc-suspension-bands-240912.pdf).

5.14 We consulted on track access charges in general terms as part of our PR13 first consultation in May 2011. In our December 2011 consultation on incentives, we stated our continued support for existence of the capacity charge, but explained that we would be asking Network Rail to revisit and recalibrate the charge for PR13. One of the conclusions we set out in our May 2012 document “Setting the financial and incentive framework for Network Rail in CP5” was that Network Rail should retain the capacity charge in CP5, but that they should look to reduce the level of aggregation at which the charge is applied.

5.15 In July 2012, Network Rail consulted on its proposed reforms to the charge, including a proposal to apply the charge at a more disaggregate service code level rather than the current service group level. We are supportive of this proposal, because we believe it will lead to train operators and funders making decisions that are more closely related to actual congestion conditions on the ground. Following on from their consultation, Network Rail is currently in the process of carrying out a recalibration of the charge, which we expect to be completed before the end of March 2013.

5.16 We expect the case for the capacity charge, and its role, to be reviewed following PR13 as part of the wider industry review of track access charges, which we discuss in the next section.

## Further work with RDG and the industry on track access charges

5.17 We are currently in discussions with Rail Delivery Group (RDG) about establishing a programme of work to consider and develop options for improving the structure of charges. This work will be led by a sub-group of the RDG. A letter from RDG of 7<sup>th</sup> September 2012 said that it *confirms its commitment to a fundamental review of the charging structure to be completed in the first half of CP5 for possible implementation in CP6. In order to achieve proper focus, RDG considers that this work should commence after ORR’s [2013 Periodic Review] determination.*” Subsequent to this letter from RDG, we have agreed with them that the RDG Contractual Reform sub-group would be used to discuss changes to charges and that a steering group will be created to guide the work.

5.18 Our aim in undertaking this work is to identify scope for charges to send better signals for efficient provision and use of network capacity, and for more efficient cost recovery, ultimately to improve value for money. Subject to our discussion with the industry, we are keen that the work should look at the balance between recovery of costs from network grant, fixed charges and variable charges and whether the structure of charges could be improved to better reflect cost and send signals for efficient provision and usage of network capacity. We are also keen to explore the scope for simplification of the charging scheme.

5.19 We are keen to look at potential geographic disaggregation of the variable usage charge and at the way in which fixed and common costs are recovered, to see whether they could be recovered more efficiently, perhaps in a way that better reflects the value of the relative scarcity of network capacity.



5.20 If we do identify changes to the structure of charges that would be beneficial in terms of achieving these aims - we will also need to consider the impact of moving to such a structure and what an appropriate transition path might look like. We do recognise a desire among some in the industry to move to a simpler structure of charges. In undertaking this work, we will need to consider also both what can be achieved within the current legal framework and also the potential impact of the recast of the first railway package of EU directives and the forthcoming fourth railway package.

5.21 In developing changes to the structure of charges, we will need to bear in mind the extent to which, within the currently constrained environment, operators will be able to respond to better price signals for more efficient use of capacity. But establishing better price signals is important since it improves transparency about true costs and the uses of revenues and subsidy. By establishing such a framework now, we will help to facilitate the industry evolving in a more commercial direction in years to come.

5.22 The possible programme for our longer-term work package, which we will discuss with the RDG contractual and Regulatory Reform sub-group, could include:

- (a) scoping and planning (which we are working on now);
- (b) establishing approach to industry engagement (which we are working on now);
- (c) exploring legal constraints and setting out a feasible set of options;
- (d) agree objectives and industry work;
- (e) exploring cost drivers and valuation methods;
- (f) candidate charging structures;
- (g) impact assessment;
- (h) consultation;
- (i) conclusions;
- (j) possible implementation of a pilot or 'shadow' scarcity charge<sup>88</sup> (at least for passenger).

5.23 The work programme will need to occupy a considerable period of time but it will be important to aim to reach the implementation stage in time to ensure a significant period of shadow running before decisions have to be taken about the charging structure for CP6. We will need to take a staged approach within this timetable – identifying changes that will get us closer to where we want to be, but with decisions at each point reflecting constraints, costs and benefits in the real world. We will also need to take account of external changes, such as to franchises and in Network Rail.

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<sup>88</sup> A shadow charge is one that is not actually implemented but for which those amounts which would have been payable under the charge are calculated and recorded

## Steps required to conclude on track access charges in PR13

5.24 Network Rail's draft price lists will be published in conjunction with our draft determination in 2013. These will be consistent with our assessment of Network Rail's strategic business plan, which we are now reviewing, and follow our audit and review of charging methodologies and calculation of individual charges.

5.25 We will conclude on price lists as part of our PR13 final determination in October 2013. The price lists will apply from 1 April 2014.

# Glossary

Term	Meaning
Access and Management Regulations	The Railways Infrastructure (Access and Management) Regulations 2005.
Advice to Ministers	We published this advice in March 2012 to inform the decisions that the Scottish Ministers and the Secretary of State will make on what they want the railways to achieve in CP5 and the public funds required to deliver this.
Asset life	The service <b>life</b> of an <b>asset, which</b> is the number of years of productive use expected from an asset.
Capex	The funds used by Network Rail to acquire or upgrade physical assets on the railway and related infrastructure in order to maintain or increase the scope of their operations.
Commercial freight	Freight services run for third party customers, as opposed to the infrastructure trains providing services for Network Rail.
Control Period	A control period is the period to which a periodic review applies.
Control Period 4 (CP4)	1 April 2009 – 31 March 2014
Control Period 5 (CP5)	1 April 2014 – end date to be decided (expected to run until 31 March 2019)
Control Period 6 (CP6)	CP6 will follow CP5, however precise dates are yet to be decided.
EC4T	Electric current for traction.
Efficiency Benefit Sharing Mechanism (EBSM)	A mechanism implemented in CP4 that provides train operators with an incentive to help improve Network Rail's efficiency in return for a share of the resulting savings.
Euronorm Technical Standards	Europe-wide standards that help to develop the single European market for goods and services in the railway sector.
ESI	Electricity supply industry
Freight avoidable costs (FAC)	The infrastructure costs that would be foregone if freight services were no longer to use the network.
Freight lifted	The goods carried by freight operators, measured in tonnes.

Freight moved	The net weight (excluding the weight of the locomotive and wagons) of the goods carried (the freight lifted, measured in tonnes) and the distance carried measured in net tonne kilometres.
Freight-only line (FOL)	Lines that carry only freight, and no passenger services.
Freight-only line charge	The charge that recovers the fixed costs associated with freight-only lines used by freight trains carrying ESI coal and spent nuclear fuel .
Freight operating company (FOC)	A train operating company is responsible for the transport of freight but not passengers.
Freight Specific Charge (FSC)	A mark-up on the variable usage charge to recover freight avoidable costs.
Geographically disaggregated charges	Disaggregation of the variable usage charge by region to better reflect the variances in the variable usage costs associated with parts of the network with different capacities and capabilities.
Heavy good vehicle (HGV)	Any vehicle designed primarily for freight transport that exceeds 3.5 tonnes gross weight.
High level output specification (HLOS)	Under Schedule 4 of the 2005 Railways Act, the Secretary of State for Transport and Scottish Ministers are obliged to send to ORR the specification to ensure the railway industry has clear and timely information about the strategic outputs that Governments want the railway to deliver during the access charges review.
Initial industry plan (IIP)	Prepared by rail industry representatives and published in September 2011, the IIP set out the key choices and options facing funders in specifying the future outputs of the railway and the level of funding required.
kgtkm	Thousand gross tonne kilometres
kgtm	Thousand gross tonne miles
ktkm	Thousand net (i.e. cargo) tonne km – a measure of tonnes moved.
Mark-up	Charges that recover costs that are judged to be more those costs directly incurred.
Network Rail efficiency challenge	The efficiency targets that ORR set for Network rail.
National Rail Trends (NRT)	The key regular publication, published by ORR, of official statistics on passenger usage, rail performance and other areas.
Opex	The key day-to-day expenditure of Network Rail.
Periodic Review	The Periodic review is our assessment of what Network Rail must achieve for the next five year control period, the money it needs to do so, and the incentives needed to encourage delivery and outperformance for the control period.
Periodic Review 2008 (PR08)	PR08 established Network Rail's outputs and access charges for CP4.

Periodic Review 2013 (PR13)	PR13 will establish Network Rail's outputs and access charges for CP5. PR13 also involves establishing the wider regulatory financial and incentive framework for CP5 that applies to Network Rail and train operators
Regulatory Asset Base (RAB)	The value of Network Rail's assets used for its regulated activities.
Statement of funds available (SoFA)	Under Schedule 4 of the 2005 Railways Act, the Secretary of State for Transport and Scottish Ministers are obliged to send to ORR the SoFA to ensure the railway industry has clear and timely information about the public funds that Government are prepared to make available to deliver the strategic outputs specified in the HLOS.
Strategic business plan (SBP)	Outlines Network Rail's plans for operating, maintaining and developing the rail network.
Strategic Freight Network (SFN)	A network of core trunk routes with sufficient capacity and appropriate gauge to carry the expected major flows of freight.
Strategic Route Section Maintenance Model (SRSMM)	A model used by Network Rail to help estimate the volume of renewal and heavy maintenance required under different levels of track use.
Variable usage charge (VUC)	The charge that reflects the cost of damage that trains operating on the network do to the underlying infrastructure.
VfM study <sup>89</sup>	A study led by Sir Roy McNulty, which set out how the railway could, by 2018-19, make substantial savings across Great Britain of between £2.5 billion and £3.5 billion (2008-09 prices) compared to 2008-09.
Vehicle Track Interaction Strategic Model (VTISM)	A model used by Network Rail to help track maintenance and renewal costs, for its strategic business plan and for estimating the variable usage charge. It was developed on behalf of the Vehicle/Track Systems Interface Committee by RSSB and Network Rail to support the industry in managing changes around the vehicle / track interface more effectively and to realise savings through optimised track and vehicle maintenance and renewal. It links inputs such as track and vehicle characteristics to outputs such as asset life, future condition and performance VTISM has the capability to assess how changes to traffic volumes and vehicle characteristics can affect track renewal, maintenance and inspections costs.

<sup>89</sup> *Realising the Potential of GB Rail - Detailed Report*, Final Independent Report of the Rail Value for Money Study, May 2011. This can be accessed at <http://www.rail-reg.gov.uk/upload/pdf/rail-vfm-detailed-report-may11.pdf>.

# Annex A - Adjustments estimates of FACs

1. Chapter 3 describes at a summary level the further adjustments that we made to the L.E.K/Arup estimates of FACs. This Annex provides further details of the adjustments that we have made to the Network Rail/L.E.K estimates of FACs, subsequent to the adjustment of variable usage costs made following Arup's work as independent Reporter. The adjustments made following the Arup work are explained in full in the Arup report, available on our website<sup>90</sup>.
2. We made the adjustments to the range described in this Annex to ensure that the estimated range of FACs is fit for the purpose of setting a cap on the freight specific charge. Where we have not made amendments, this should not be interpreted as our endorsement of the more detailed aspects of L.E.K's methodology.
3. Table 3.2 sets out the Network Rail's estimates of FACs as adjusted by Arup's work: this table, reproduced as Table A.1, provides a reference point for the further adjustments we have made.
4. In reviewing the L.E.K work further, we identified a number of areas for refinement:
  - (a) The extremes of L.E.K's range (i.e. the difference between the high and the low estimates) allow for a number of assumptions that are not improbable in isolation but which are much less likely to occur in combination.
  - (b) The approach that L.E.K had used to estimate costs recovered through charges (which are subtracted from gross cost estimates to produce estimates of net FACs) employed some simplifications and misinterpretations of current freight charges, and how these charges may change over the 35-year appraisal period.
  - (c) We challenged the assumptions L.E.K used to develop estimates for some cost categories, and were not convinced that L.E.K had accurately incorporated all the results from this challenge process. These challenges, and resulting adjustments, are set out in detail below.

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<sup>90</sup> [Review of Network Rail VTISM modelling and allocation to market segments for Freight Avoidable Costs, Arup, November 2012](#)

(d) Although it was considered in the L.E.K. work, the Network Rail/L.E.K estimates excluded any forecast contribution from land disposal proceeds.

5. As a result we have made a number of further amendments to the figures presented in Table A.1.

**Table A.1: Network Rail's estimates of FACs adjusted by Reporters recommendations**  
(£m a year)

	Description <sup>91</sup>	Gross Costs		Costs recovered		Net Costs	
		Low	High	Low	High	Low	High
1	FOL	17	23	6	8	11	15
2	Redundant fixed costs	7	12	0	0	7	12
3	Variable usage costs	96	215	87	94	9	121
3	Variable usage costs – as revised by reporters	171	246				
4	Redundant enhancements costs	60	84	0	0	60	84
5	Conseq. cost reductions	58	77	17	26	41	51
6	Conseq. cost increases	-88	-39	0	0	-88	-39
7	NR staff costs	4	5	0	0	4	5
	<b>Total – L.E.K</b>	<b>154</b>	<b>377</b>	<b>110</b>	<b>128</b>	<b>44</b>	<b>249</b>
	<b>Total – adjusted for reporters' recommendations</b>	<b>229</b>	<b>408</b>	<b>110</b>	<b>128</b>	<b>119</b>	<b>280</b>

### Global adjustments to Network Rail/L.E.K estimates

6. We made the following global adjustments to the Network Rail/L.E.K estimates:

(a) We have adjusted the estimates for each cost category to allow for the fact that the Network Rail/L.E.K "low" and "high" estimates allow for a number of assumptions that are not improbable in isolation, but which are much less likely to occur in combination. We have therefore removed the top and bottom 5% of the estimated range for most cost categories (the exceptions are the categories covered by other specific adjustments as described below: variable usage costs, redundant enhancement costs

<sup>91</sup> Category definitions are provided in Table 3.1

and consequential cost increases). We consider that this adjustment process removes extreme "worst case" scenarios, and produces more prudent, robust estimates of costs for each item when it is used together with the existing analysis.

(b) We have estimated costs recovered through charges by taking current charges (adjusted as appropriate for our policy conclusions as set out in Chapter 2) and then increasing them by average forecast freight traffic growth over 35 years as appropriate, using forecast volume growth from the IIP of between 37% and 42% (depending on the metric used for each charge). Where L.E.K has estimated other average freight charges, we have made no further adjustments: however, we have adjusted L.E.K's estimate of forward-looking variable usage charges as described below. This adjustment reduces total charges netted off gross costs by £26m per year (for the low case) and £33m per year (high case).

(c) Network Rail/L.E.K estimates exclude the impact of land disposal proceeds when freight land or property is sold for another use. L.E.K carried out some initial analysis of the potential scale of these proceeds, which is set out in its report. We have developed this initial analysis and also analysed recent information from Network Rail's regulatory accounts on land disposal income to produce estimates for this cost category. More details are given below on the development of our estimates.

### Other specific adjustments for each cost category

7. During our challenge process, we identified a number of specific issues for individual cost categories. These issues, and resulting adjustments, are described below.

8. In this section we describe more detailed changes that we have made to the estimates. Each category of cost is discussed in turn, following the structure of Table A1. Unless otherwise stated, for each category we have also removed the top and bottom 5% of the Network Rail/L.E.K. estimated range. We also discuss estimates of two further categories of costs that we consider relevant to an estimation of FACs - land disposal proceeds and Electricity for Traction (EC4T) charges<sup>92</sup>.

**9. Freight-Only Line costs (FOL):** we have made no adjustments to the Network Rail/L.E.K. analysis of FOL costs. The allocation of these costs to commodities and the application of the allocation metric in producing indicative caps on charges are described in more detail in Chapter 3.

**10. Redundant fixed costs (infrastructure assets):** We have made no adjustments to the Network Rail/L.E.K. analysis of redundant fixed costs.

**11. Variable usage costs (VUCs):**

(a) The process for adjusting estimates of gross variable usage costs using Arup's analysis of track-related costs is described in Chapter 3. Arup's adjusted estimates allow for the impact on variable usage

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<sup>92</sup> L.E.K. considered these charges but did not present them explicitly in its analysis



costs of the engineering trains that Network Rail will continue to run in future if commercial freight traffic is removed from the network. We used Network Rail/L.E.K estimates for variable usage costs for assets other than track, as we consider that those estimates are based on reasonable extrapolations of current cost estimates.

(b) However, L.E.K's estimates of the charges that should be netted off gross variable usage costs do not appear to be based on current freight charges. We have therefore used instead an estimate of average variable usage costs recovered through charges based on current charges, with the following adjustments for future years:

- (i) we factored up current variable usage charges by 7%, in line with our policy for capping variable usage charges described in Chapter 2;
- (ii) we applied average growth of 18.5% in equivalent gross-tonne-km (based on total forecast growth in the IIP of 37%) in freight volumes for the 35 year period.

**Table A.2: Estimation of variable usage costs recovered through charges**

Item	Value	Basis/Source
Current variable usage charges	£48m p.a.	NR Regulatory Accounts, 2011/12
Increase in average variable usage charges (relative to current CP4 charges)	7%	Table 2.1 in this document
Uplifted variable usage charges	£51m p.a.	Applying the 7% increase to current charges
Average growth in traffic over the 35-year analysis period	18.5%	L.E.K use IIP figures to estimate a 37% increase in equivalent gross-tonne-km, which is used to grow track-related variable usage costs. $37\%/2 = 18.5\%$ - an average figure <sup>93</sup> .
Annual average variable usage costs recovered through charges	£61m p.a.	Apply the 18.5% average growth to the uplifted estimate

**12. Redundant enhancement costs** (including the Strategic Freight Network, or SFN): we consider that the Network Rail/L.E.K approach to estimating these costs not unreasonable, noting that L.E.K consulted in detail with freight stakeholders on the freight-related elements of planned enhancements. However, we recognise concerns expressed by stakeholders during the consultation process that the L.E.K "high"

<sup>93</sup> The weighted average over 35 years is identical to the simple arithmetic average, rounded to the nearest percentage point.

estimate for enhancement costs other than the SFN<sup>94</sup> was based on Network Rail scheme estimates which appeared to include excessive levels of contingency in some cases. The high contingency allowance for these CP5 schemes appears to be inconsistent with our current investment framework policy. We therefore consider that the “high” estimate of enhancement costs should be factored down by 10% to allow for the contingency allowance. We include this adjustment in our revised estimate of FACs.

**13. Consequential cost reductions** (such as Schedule 4 and 8 costs): we consider that the Network Rail/L.E.K approach to estimating these costs is not unreasonable, based on a detailed analysis of current costs and corresponding charges. However, we have removed the estimated costs associated with congestion and capacity usage, as we consider that these costs are already included within Network Rail/L.E.K estimates of Schedule 8 costs and therefore are included twice. The congestion and capacity usage costs that we have removed accounted for around £6m in the Network Rail/L.E.K estimates.

**14. Consequential cost increases (primarily engineering trains)**

(a) Network Rail/L.E.K constructed low and high cases for this cost category by estimating the expected incremental long-term annual costs (both capital and operating costs) of procuring engineering trains currently provided by freight operators through two scenarios: either leasing or buying the trains. These cost estimates exclude infrastructure-related usage costs – which are included in the adjusted estimate of variable usage costs (see above). However, we assume that Network Rail would procure engineering trains in a way that delivers best value for money: therefore, if leasing is the cheaper of the two long-term procurement solutions, then the more expensive “buy” scenario is irrelevant for estimates of this cost category.

(b) We also share concerns (initially raised by stakeholders) over L.E.K.'s approach to estimating marginal pricing benefits that it considers Network Rail currently receives from freight operators by virtue of their providing this service.

(c) Given these considerations, we have discarded the higher cost Network Rail/L.E.K engineering train estimate, which is used in the “low” overall cost scenario, and instead have created an adjusted estimate using the Network Rail/L.E.K. “low” scenario and adding a contingency of 5% to represent a confidence interval around the Network Rail/L.E.K. estimates. Applying this 5% confidence interval produces a “low” and “high” case around the adjusted estimate.

**15. Network Rail staff costs:** We have made no further adjustments to the Network Rail/L.E.K. analysis.

**16.** In addition to adjusting the L.E.K. estimates, we consider that some categories of cost were omitted from the L.E.K. work: land disposals and EC4T charges, both of which are discussed below:

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<sup>94</sup> The SFN is treated as a capped enhancement fund without explicit allowances for contingency

## 17. Land disposals

(a) Network Rail/L.E.K. estimates exclude the impact of land disposal proceeds when freight land or property is sold for another use. L.E.K. carried out some initial analysis of the potential scale of these proceeds, which is set out in its report. We have developed this initial analysis.

(b) We have therefore constructed an estimate for disposal of freight land that would have no railway use if freight were removed, using L.E.K.'s initial analysis of freight land and property assets and Network Rail regulatory accounts information on recent disposals. Our estimate for the “high” scenario is based on amortised current rents, without applying any uplift for the market value relating to alternative uses for the land, and therefore represents a prudent estimate. We recognise that actual land disposal proceeds are subject to significant variations due to the nature of the commercial property market, and the fact that some land or property may represent future liabilities to Network Rail (for example, land decontamination costs may impose costs before any sale is possible). Therefore, we consider that in the “low” scenario, land disposals will make no net contribution to costs – consistent with the Network Rail/L.E.K. estimates.

18. **Other (EC4T charges):** we have included EC4T charges as a separate item which is netted off gross costs, having applied growth factors to these charges on a basis consistent with the treatment of other charges, to allow for forecast IIP traffic volumes.

19. The resulting adjusted estimates are shown in Table A.3, which is identical to Table 3.4 in Chapter 3. It shows the combined impacts of all the adjustments to the Network Rail/L.E.K. estimates in a single table. Those cost categories where we have applied specific adjustments to the Network Rail/L.E.K. estimates are highlighted in blue in the table.

**Table A.3: Adjusted FAC estimates (£m a year)**

	Description	Gross Costs		Costs recovered through charges		Net Costs	
		Low	High	Low	High	Low	High
1	FOL	18	22	-6	-8	12	14
2	Redundant fixed costs	7	11	0	0	7	11
3	Variable usage costs	171	236	-61	-61	110	175
4	Redundant enhancement costs	63	76	0	0	63	76
5	Consequential cost reductions	56	66	-3	-6	52	60
6	Consequential cost increases	-41	-37	0	0	-41	-37
7	NR staff costs	4	5	0	0	4	5
8	Land disposals	0	22	0	0	0	22
9	Other (EC4T charges)			-8	-13	-8	-13
	<b>Total</b>	<b>278</b>	<b>400</b>	<b>-78</b>	<b>-88</b>	<b>200</b>	<b>312</b>

# Annex B – Cost Benefit Analysis

## How we use the cost benefit analysis

1. Cost benefit analysis can be used to inform decision makers of the strength of the case for a particular policy or form of expenditure. Here, we have prepared a high level cost benefit analysis as part of our response to stakeholders' concerns that we have not considered wider impacts of a freight specific charge sufficiently.
2. The overarching message is that costs and benefits of a freight specific charge are finely balanced (and depend on the structure of costs): Network Rail's costs saved from fewer coal trains are evenly balanced against the disbenefits to customers and others in the supply chain associated with the tonne km lost to rail.
3. This finding implies that the existing subsidy of coal trains, in the form of track access charges that do not recover costs, can deliver greater benefits by being directed elsewhere, because the business case for many other forms of public expenditure is stronger (and we give the example of the Felixstowe to Nuneaton freight enhancement scheme for which the Initial Industry Plan forecast that the benefits would be double the costs).
4. Our decision on this policy is made in accordance with the legal framework we set out in this document. The cost benefit analysis is one of a number of useful pieces of analyses to inform our decision; it does not determine it.

## Explanation of our analysis

5. In this table we set out a cost benefit analysis for ESI coal of having a zero freight specific charge (as at present) compared with the three charging options tested by our consultants MDS Transmodal:
  - (a) £5 charge per thousand net tonne km (equivalent to a £4 charge per kgm net of variable charges and freight-only line charge);
  - (b) £10 charge per thousand net tonne km (equivalent to a £8 charge per kgm net of variable charges and freight-only line charge); and

(c) £15 charge per thousand net tonne km (equivalent to a £12 charge per kgkm net of variable charges and freight-only line charge).

**Table B.1: Indicative cost benefit analysis of removing a FSC for ESI coal**

	2018-19 £ million	£5 charge	£10 charge	£15 charge
<b>Benefits</b>				
A	Lower charges to customers	£24.0	£42.2	£56.9
B	Gains for those changing their behaviour	£1.8	£3.6	£5.4
	External impacts of changes to road traffic	£0	£0	£0
C= A+B	Total benefits	£25.7	£45.8	£62.3
<b>Costs</b>				
D	Net loss of income for Network Rail (FSC & VUC)	£22.4	£39.4	£53.1
E	Additional infrastructure costs	£3.7	£12.4	£26.2
F=D+E	Total cost	£26.0	£51.7	£79.2
G=C-F	<b>Net benefits</b>	<b>£-0.3</b>	<b>£-5.9</b>	<b>£-17.0</b>
C/F	<b>Benefit: cost ratio of subsidising coal</b>	<b>0.99</b>	<b>0.89</b>	<b>0.79</b>
Compare:	<b>Benefit: cost ratio of Felixstowe enhancement (from IIP)</b>	<b>2</b>		

6. We used MDST's forecasts of the impact of the charge on levels of traffic and on revenue.

7. In line A revenue associated with the freight specific charge is the sum gained by customers who no longer pay the charge, but Network Rail lose a smaller amount of revenue from charges (line D). The loss of income for Network Rail is less than the reduction in charges to customers as there is an offsetting gain in existing charges as traffic levels rise.

8. In row B we calculate the benefits to new customers who change behaviour so as not to pay the charge (wherever they are on the supply chain) using standard appraisal technique "rule of a half". The rationale is as follows. We know that for each individual journey the benefits are greater than or equal to zero (otherwise they would not have switched) and they are less than or equal to the charge (otherwise they would have switched earlier). By applying these insights, it is standard practice in transport appraisal to assume that on average the disbenefits are half the value of the charge (the "rule of a half"). Hence, by forecasting the impact of the charge on demand, the total benefits can be calculated. Note that all benefits

or disbenefits in normal functioning markets are accounted for in this approach, including benefits associated with stranded assets. Only benefits associated with distorted markets - for example associated with high levels of structural unemployment - are not accounted for in this methodology, and they are discussed separately in the context of mining.

9. We have calculated the external impacts, using the MDST forecasts. For each option, we estimate the freight specific charge to deliver external benefits of less than £50 thousand a year. These are too small to show on our table. We have calculated these as follows, for example for the £10 option:

(a) Using Table 5 from MDST's stage 2 report, there is a forecast increase in road only traffic in Scotland of 94 thousand tonnes for the forecast year; and a forecast reduction in road traffic to railheads in Scotland of 498 thousand tonnes.

(b) Using data from MDST's December 2012 note, we assumed that the length of haul for the road journeys is 100km (to Longannet), and for the railhead 20km. This gives a net reduction of coal transported by road of 560,000 tonne km.

(c) We have then assumed 13 tonnes transported per HGV and external costs of 27.3 pence per HGV km (source: MDST stage 1 report). Allowing for the two way journey, this gives an annual benefit of £22 thousand from the freight specific charge.

10. We estimated the savings in infrastructure costs (row E) by:

(a) Assuming that the charge was set to equal FACs

(b) That variable usage costs would be saved in proportion to the reduction in traffic, but no other Network Rail costs would be saved.

11. This methodology is not detailed, and provides an indication of the level of infrastructure costs saved only.

12. The benefit: cost ratio (C/F) is of **removing** a charge by means of a subsidy. It compares the benefits of avoiding the "disbenefits" of the charge with the costs of foregoing the savings associated with the charge.

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