Periodic Review 2013
Consultation on the variable usage charge and on a freight-specific charge

May 2012

OFFICE OF RAIL REGULATION

Contents

Executive Summary

Purpose of the consultation

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)[1].

2. The purpose of this consultation is to:

(a) consult on work undertaken to estimate the average variable usage charge paid by both passenger and freight operators to recover the cost directly incurred by running trains on the network;

(b) allow us to draw conclusions, on the basis of this consultation, on the likely scale of the variable usage charge for control period 5 (CP5)[2], in order to establish a cap on the average level of the variable usage charge; and

(c) consult 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 that are not currently recovered from other freight charges (we call these "freight avoidable costs").

3. We are doing this work at this stage of PR13 as we intend to establish upper limits or "caps" on certain track access charges for freight operators well in advance of our PR13 final determination in October 2013. We are intending to implement a new track access charge to recover freight avoidable costs, in order to make the structure of access charges more cost reflective, reduce cross-subsidy and to ensure that freight operators make a greater contribution to the costs that freight operations impose on the network. Tighter economic and fiscal conditions have strengthened the case for reducing such cross subsidy. Doing this should improve the focus of Network Rail and freight operators to work together to identify ways to improve cost efficiency.

4. The consultation may be of interest to a wide range of stakeholders. We anticipate, however, that it will be of particular interest to:

(a) passenger and freight operators, with respect to the work on the variable usage charge; and

(b) freight operators, freight customers, the wider electricity supply industry (ESI), and the UK and Scottish governments, with respect to our proposal concerning a new charge for specific freight traffic.

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[1] PR13 will establish Network Rail's outputs and access charges for control period 5 (CP5), which is expected to 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.

[2] Control period 5 starts on 1 April 2014, and is expected to run to 31 March 2019.

Context

5. This consultation is relevant for both passenger and freight services, because the variable usage charge is levied, on an equivalent basis, on all such services. Franchise passenger operators are currently protected against total changes to the variable usage charge they pay – as part of an adjustment mechanism in their franchise agreement – and therefore this consultation is of most interest to freight operators.

6. Rail freight plays an important role in Great Britain's logistics and makes a significant contribution to the economy. Around 25% of the 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 are delivered by rail. Overall, 28% of deep sea containers that arrive or depart from the major ports are transported by rail.

7. There are wider economic and social benefits of moving freight by rail, including environmental, road decongestion and safety benefits. Without rail freight, there would have been an additional 6.7m road journeys in 2007-08. Switching from Heavy Goods Vehicles (HGVs) to rail reduces CO_2 emissions by 70% per tonne moved, and on average 28 pence per HGV mile in road decongestion benefits.

8. Between privatisation and 2006-07 the rail freight market grew by 70% in terms of net tonne km, although there has been a reduction since that high point due to the global economic downturn. The largest growth market (in percentage terms) has been in the movement of deep sea containers. The rail freight industry has itself invested over £1.5 billion since 1995. The UK and Scottish governments also provide support: for example, for the current control period, over £200m of government funding is committed as contribution to deliver of the rail strategic freight network, a network of trunk routes with sufficient capacity and appropriate gauge to carry expected freight flows.

9. Furthermore, since privatisation rail freight operators have achieved significant improvements in productivity. In their *Manifesto for Rail Freight Growth*, 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."

10. However, freight traffic is a relatively small part of the total traffic on the railway. Freight currently accounts for about 7% of traffic on the network measured in train km[3]. It operates commercially, competes with other transport modes, particularly road haulage, and only receives limited grant support from government to encourage modal shift from road to rail. Unlike most passenger operations, freight operators are open access operations, and are not franchised by government. Freight operators currently pay only variable track access charges and do not contribute to the fixed cost of the railway, with the exception of ESI (energy supply industry) coal and spent nuclear fuel traffic on freight-only lines – a change in access charging policy we implemented in 2009-10, following our 2008 periodic review. Freight access charge income received by Network Rail in 2010-11 was £55 million, less than 1% of Network Rail's total income of £6 billion[4]. The additional avoidable costs that Network Rail incurs from providing the network for freight

[3] Excluding infrastructure trains, i.e. trains operated by the freight operators for Network Rail hauling material to/from possessions such as ballast.

[4] The freight access charge income of £55.2 million excludes the compensation of £12.3 million received from Network Rail under the performance regime. For England & Wales and Scotland the freight access charges income in 2010-11 was, respectively,

services (with the current best estimate of these at £200 million - £250 million per annum) is currently paid by the UK and Scottish governments through the network grant[5].

11. The ORR helps create an environment that supports rail freight. For example, we set regulatory obligations for Network Rail regarding network availability and performance for its passenger and freight customers (and in 2012 we have required Network Rail to establish a recovery board with its freight customers to agree steps it will take to meet these obligations). We determine the performance and possessions compensation regimes for operators, which reduces operators' risks to Network Rail's performances at relatively low transaction costs. We also determine track access charges, in the form of transparent price lists. In the previous periodic review, we determined a variable usage charge for CP4 that was 35% below that for the previous control period.

Variable usage charge

12. The variable usage charge is designed to recover Network Rail's operating, maintenance and renewals costs that vary with traffic. Currently each vehicle operating on the network has a specific rate, reflecting the wear and tear it causes to the network. The rates are averaged across the network as a whole, i.e. there is a single GB-wide 'price list' for each vehicle type.

13. The charge is paid by all operators. Network Rail's associated revenue in 2010-11 from franchise passenger operators, open access passenger operators and freight operators was £137 million, £3.6 million and £41.4 million respectively. For 2010-11 the charge was on average around £0.50 per train mile for passenger services and around £1.60 per thousand gross tonne miles (kgtm) for freight services. For freight operators it amounts to around 75% of the charging revenue paid to Network Rail.

14. We asked Network Rail to estimate its variable costs and hence an indicative range for the average variable usage charge. Following consultation, it estimated average variable costs which were 5% to 7% higher than those calculated for CP4, excluding any changes to efficiency assumptions. Taking account of the changes it has made in response to its earlier consultation and the review of the independent reporter, we are broadly content with Network Rail's work on this to date[6].

15. We are proposing a cap on the average variable usage charge, across all passenger and freight services, at £1.79per kgtkm (2011-12 prices) for end CP4 efficiency. This is the best estimate of £1.56 per kgtkm plus a band of uncertainty of 15%. The charge would then be adjusted for determined improvements in Network Rail's efficiency, and our analysis to date suggests the associated reduction in the charge would exceed 15%.

16. Network Rail has proposed a cap specific to freight services. We have announced our intention to implement a variable usage charge that is geographically disaggregated, but these proposals are as yet insufficiently advanced for us to be able to propose a cap specifically for freight services that would hold for a geographically disaggregated charge. However, we also recognised that it may not be possible to implement such geographically based charging at the start of CP5. Instead, therefore, we are proposing a

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£46.8 million and £8.4 million out of total income for England & Wales and Scotland of, respectively, £5,431 million and £589 million.

[5] The network grant is paid directly to Network Rail by the UK and Scottish governments in lieu of the fixed track access charges, subject to our approval. Network grant currently forms around two-thirds of Network Rail's income each year.

[6] The reporters are independent experts who provide us with assurance of the accuracy and reliability of Network Rail's information.

variable usage charge cap for freight services that would hold for a nationally-based charge. The cap is as per Network Rail's proposal: £1.68 per kgtkm (2011-12 prices) for end CP4 efficiency, which is £1.46 per kgtkm plus a 15% confidence band.

Framework for a new freight charge to recover freight avoidable costs

17. We are proposing to introduce a new charge in CP5 for freight operators, to recover infrastructure costs caused by freight operating on the network but not currently recovered from other freight charges (we term these costs "avoidable costs"). These costs would not need to be incurred (and so would be avoided) by Network Rail if freight services were no longer to use the network. This new charge should serve to make freight charges more cost reflective and reduce cross-subsidy[7].

18. In considering the implementation of any new charge for freight operators we have to take account of the Railways Infrastructure (Access and Management) Regulations 2005 (the Regulations), which implement Directive 2001/14/EC. The Regulations allow mark-ups (such as a charge to reflect the avoidable costs of freight) to be levied on top of the cost directly incurred (reflected in the variable usage charge) only if the market segment can bear the increase. In implementing any charge, we also need to balance our statutory duties, including having regard to the funds available to the two governments and allowing freight operators to plan their businesses with a reasonable degree of assurance.

19. We are consulting on options for the units of the charge, for example a charge per gross tonne mile or a charge per tonne.

Freight avoidable costs

20. Currently we have preliminary indicative estimates of the scale of total freight avoidable costs not funded by other freight track access charges (around £200m to £250m a year as a central estimate at current levels of efficiency). The revenue associated with the charge would be less than this if it were only levied on certain market segments. Network Rail is undertaking work, which will report in the autumn, to estimate freight avoidable costs. We expect it to engage with freight operators and others in undertaking this work, and we expect to use the company's estimates in making final decisions on a cap on the charge to recover freight avoidable costs. The costs will then be refined further and subject to independent review.

21. We are consulting on options for allocating these costs between different market segments.

Analysis of freight market segments

22. In order to establish the charge to recover freight avoidable costs, consistent with the EU legislation, in deciding whether or not to levy higher charges on certain markets, we need to ensure the charges are efficient and that the market can bear the charge. Our market analysis assesses the efficiency of charges, by assessing the elasticity of demand, i.e. how the demand for rail freight might fall or rise as a result of higher charges; and 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). In addition it assesses whether the market can bear higher charges, by considering whether there is significant risk that the charge might result in the exclusion of the use of the infrastructure by a market segment.

[7] The charge would replace the current freight-only line charge which recovers the avoidable costs of freight-only lines used by freight trains carrying ESI coal and spent nuclear fuel (which was around £5 million in 2010-11).

23. We have commissioned consultants to analyse the impact of charge increases on freight traffic and competition with road freight. We have used the analysis to investigate the potential to apply a charge to ESI coal, spent nuclear fuel, iron ore and other coal (including biomass). We have tested how these market segments might respond to charges consistent with our preliminary estimates of the allocation of freight avoidable costs.

24. This analysis showed that demand for ESI coal is not sensitive to changes in track access charges: for example, a charge representing around a four-fold increase on current charges is forecast to be associated with a reduction of 5% in ESI coal lifted. The fall in demand for rail freight transporting the coal (coal moved), however, may be more substantial because there is scope for reductions in length of haul. Indicative analysis suggested a potential reduction of 25%, though some continued rationalisation of length of haul may occur in any case as coal traffic continues to fall in response to the introduction of stricter environmental standards.

25. Our consultants' assessment was that the level of freight traffic transporting spent nuclear fuel is not affected by the increase in track access charges we have considered. Similarly, freight traffic transporting iron ore is not affected by the increase in track access charges we have tested. We have also considered the potential for steel production to relocate as a result of an increased track access charge for iron ore, but consider this unlikely as we estimate the charge we have tested to represent an increase in steel production costs of around 0.1%. Biomass is a substitute for coal, its demand is dependent in part on the associated subsidy regime, and is a new developing market. Other coal, used for various industrial purposes, appears to face stronger competition from road in some instances.

26. On the basis of our analysis and our principal criteria for proposing a charge, we propose to levy a new charge on ESI coal traffic and spent nuclear fuel traffic (the only commodities to which the freight-only line charge currently applies). We are also considering levying a charge on iron ore. For iron ore, we recognise that there is a theoretical risk that this market segment might be excluded from use of the infrastructure as a result of the charge, and so we particular welcome stakeholders' comments on our analysis and other relevant factors that they wish to draw to our attention.

27. There is a balance to be struck in levying such a charge. This balance requires us to have regard to our statutory duties, of which relevant ones include having regard to the funds available to the Secretary of State for Transport and Scottish Ministers and to promote the use of the railway in GB for the carriage of (passengers and) goods. Reflecting this, we are proposing to levy a "freight traffic" cap on the charge so that the forecast fall in traffic resulting from the charge does not exceed a specified amount in any one market segment, and we are proposing a level of 10%.

28. We are not proposing to levy such a charge for biomass as part of this periodic review because the market is in an early stage of development. Instead, we propose to revisit this policy to coincide with the recalculation of its associated credit (subsidy) regimes (from 2017 for England and Wales). We are considering whether we would then implement any charge for biomass at the point that the new credit levels are introduced or for the subsequent control period (CP6).

29. We are considering further whether it is appropriate to levy a charge on "other coal", or potentially subdivide it into further market segments and apply the charge differentially. We seek consultees' views on this.

30. We propose not to levy a new freight charge on the other freight market segments on the basis that they face significant competition from road freight and had more elastic demand. We consider that this

approach is proportionate and consistent with our approach in PR08 with respect to freight-only lines and with our statutory duties including our duty to contribute to the achievement of sustainable development.

31. Table 1 summarises our proposals for the new charge for each individual rail freight market segment.

Table 1: Summary of our proposals for a new charge for individual rail freight market segments

Rail freight market segment	Propose to levy a charge to recover market segment's share of freight avoidable costs?
Coal for electricity supply industry	Yes, subject to cap so that forecast traffic does not fall by more than a set percentage (10%?)[8]
Spent nuclear fuel	Yes
Iron ore	Yes (but we particularly seek stakeholders' comments on our analysis, recognising the theoretical possibility of excluding this market segment from use of the infrasturcture).
Biomass	Not as part of PR13, because the market is not yet sufficiently developed. But revisit for CP6 or point where subsidy is revisited (2017).
Coal transported for other purposes	We are considering this further.
Other freight market segments	No, on basis that these markets are more elastic and face greater competition from road freight. This approach is proportionate, consistent with our approach in PR08 with respect to freight-only lines, and with our statutory duties including our duty to contribute to the achievement of sustainable development.

Next steps

32. We will be holding an industry workshop on Friday 18 May 2012 to discuss the topics in this consultation. Recognising the importance of this topic to certain individual stakeholders, we will hold a further workshop on Thursday 5 July. Attendance at the workshop is open to all but requires prior registration. Details can be found on our website (www.rail-reg.gov.uk/pr13).

[8] The principle of the cap would apply to all market segments to which the charge is levied; but for certain market segments, such as spent nuclear fuel, the forecast demand impact of the charge is negligible so that the cap has little practical relevance.

33. The consultation closes on Friday 10 August 2012. This is an important consultation, and we very much welcome stakeholders' input and formal responses. We also appreciate the contributions stakeholders have made in the work conducted to date in preparing this consultation.

34. Certain work will be progressing during the consultation. In particular, Network Rail is preparing estimates of freight avoidable costs, which will be used to inform our conclusions on capping the associated charge (though these will be refined further and subjected to independent scrutiny).

35. We will publish our conclusions to this consultation in November 2012. We will use the results of the consultation and Network Rail's work on freight avoidable costs to set out caps on freight specific charges, (in the form of £ per kgtm, though the charge may not ultimately be levied on that basis). As part of our conclusions, we expect to confirm the commodities to which the charge would apply, and may also confirm the basis for the allocation and the units of the charge, though this may be subject to further consultation. At the same time, we will confirm a cap on the average variable usage charge.

36. Work on refining Network Rail's costs – including freight avoidable costs - and efficiency assumptions, will continue as the periodic review progresses. The key milestones are Network Rail's strategic business plan, to be published in January 2013, and our draft and final determinations, to be published in June and October 2013 respectively.

1. Introduction

Purpose of the consultation

1.1 This consultation forms part of the 2013 periodic review (PR13), which will set Network Rail's outputs, access charges and wider regulatory and incentive framework for control period 5 (CP5) – which we expect to run from 1 April 2014 to 31 March 2019.

1.2 The purpose of our consultation is to:

(a) consult on work undertaken to estimate the average variable usage charge paid by both passenger and freight operators to recover the cost directly incurred by running trains on the network;

(b) allow us to draw conclusions, on the basis of this consultation, on the likely scale of the variable usage charge for control period 5 (CP5) , in order to establish a cap on the average level of the variable usage charge; and

(c) consult 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 that are not currently recovered from other freight charges (we call these "freight avoidable costs").

1.3 We are proposing to set a cap on some charges in accordance with our statutory duty "to enable persons providing railway services to plan the future of their businesses with a reasonable degree of assurance". We think that there is a strong case for doing this in the context where we are proposing a new charge for rail freight traffic. For pragmatic reasons we are proposing a cap on the new charge and on the variable usage charge only, because revenue from other freight charges is small in comparison to that for the variable usage charge.

1.4 We will set the cap to be the maximum possible level of charge based on the information available at this stage in the periodic review[9]. We intend to determine a cap such that we would have a high degree of confidence that it would not be exceeded: to do otherwise would undermine its purpose. Nevertheless, there is a hypothetical possibility that we, subsequent to setting the cap, become aware of material evidence which showed that the charges should be such that they exceeded it. This may occur either as

[9] This is how we described a charges cap in the 2008 periodic review (PR08) also.

part of PR13 or in an interim review following our PR13 determination[10]. In such circumstances, we may need to determine charges that exceed the cap[11].

1.5 Earlier this month we published our document "Setting the financial and incentive framework for Network Rail in CP5", in which we set out our approach and next steps in relation to the incentive framework[12]. In the framework document, we explained that we are asking Network Rail to prepare a schedule of variable usage charges that are geographically disaggregated. This consultation does not relate to that work, but rather concerns the estimation of a single average charge, as a step on the way to calculating individual charges.

1.6 The consultation may be of interest to a wide range of stakeholders. We anticipate, however, that it will be of particular interest to:

(a) passenger and freight operators, with respect to the work on the variable usage charge; and

(b) freight operators, freight customers, the wider electricity supply industry (ESI), and the two governments, with respect to our proposal concerning a new charge for some freight traffic.

Structure of the consultation

1.7 The remainder of this consultation is structured as follows.

(a) In the rest of this chapter we set out how to respond to our consultation.

(b) Chapter 2: **Background**, describes the background to this document, including information regarding PR13 and track access charges, as well as relevant aspects of the rail freight market.

(c) Chapter 3: **Variable costs**, describes cost variability with freight traffic, focussing on recent work carried out by Network Rail to develop variable cost estimates, and considers the implications of this work.

(d) Chapter 4 describes the **Framework for a freight-specific charge**.

(e) Chapter 5 considers **Fixed costs** relating to freight, and freight avoidable costs.

(f) Chapter 6 describes analysis of the **Market response** to potential increases in freight track access charges.

(g) Chapter 7 summarises key **Conclusions and next steps**.

[10] The interim review would be an access charges review that results in charges being re-determined part way through CP5. For the current control period we have set out a number of criteria that would initiate an interim review.

[11] Network Rail has asked us to confirm, as we do here, that the setting of the cap does not affect Network Rail's funding. In PR13, we will determine Network Rail's revenue requirement, and hence Network Rail's net funding requirement, without reference to the cap.

[12] *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/upload/pdf/financial-incentive-framework-cp5.pdf.

Responding to the consultation

1.8 We welcome responses on any aspect of this consultation. In particular we welcome responses to the specific questions we ask throughout this document. These are summarised in chapter 7.

1.9 This is a 12 week consultation. Please send your responses in electronic (or if not possible, in hard-copy format) by Friday 10 August 2012 to:

Joe Quill

Email: joe.quill@orr.gsi.gov.uk

Office of Rail Regulation

One Kemble Street

London

WC2B 4AN

Tel: 020 7282 3874

1.10 Our aim is that all documents on our website adhere to certain standards of accessibility. For this reason, we would prefer to receive your correspondence in an editable format such as Microsoft Word. If you do send a PDF document or similar, we would be grateful if you could create it from an electronic file rather than an image scan, and ensure that no security is set in the document properties.

1.11 If you send a written response, you should indicate clearly if you wish all or part of your response to remain confidential to ORR. Otherwise, we would expect to make it available on our website and potentially to quote from it. Where your response is made in confidence please can you provide a statement summarising it, excluding the confidential information, which can be treated as a non-confidential response. We may also publish the names of respondents in future documents or on our website, unless you indicate that you wish your name to be withheld.

2. Background

Introduction

2.1 This Chapter summarises relevant background to our consideration of freight charges by summarising:

(a) the PR13 process;

(b) the key features of the rail freight industry today;

(c) industry reform and the freight package; and

(d) the current structure of access charges.

Periodic Review 2013 (PR13)

Overview

2.2 PR13 will determine the outputs that Network Rail will be required to deliver in CP5, the cost of delivering those outputs reflecting challenging but achievable levels of efficiency improvement, and the access charges the company can levy on train operators for using its network through which it will recover those costs. PR13 will also establish the wider 'regulatory framework' for CP5. This includes the financial framework within which Network Rail can operate and the incentives that will act on both it and train operators (and through them on suppliers and rolling stock operating companies (ROSCOs)) to deliver and outperform our determination, including targets for performance and assumptions for efficiency.

2.3 Reflecting the separate responsibilities for setting the strategy and funding the railway across Great Britain, we will determine separate outputs, access charges and regulatory frameworks for Network Rail in England & Wales and in Scotland, whilst taking account of the fact that Network Rail is a single company.

2.4 Box 2.1 sets out the ways in which the periodic review, and its subsequent enforcement, is important for passenger and freight operators.

Our objective for PR13

2.5 In May 2011, we set out for consultation our proposed objective for PR13. Overall, stakeholders' comments were supportive, and we have decided to retain our proposed objective, which is to protect the interests of customers and taxpayers by:

> *ensuring our determination enables Network Rail and its industry partners to deliver or exceed all the specified outcome and output requirements safely and sustainably at the most efficient levels possible, comparable with the best railways in the world by the end of the control period.*

Box 2.1: Why PR13 is important for passenger and freight operators

Operators are affected in a number of important ways by the periodic review, for example:

- we determine the track access charges levied by Network Rail on train operators

- we determine the performance and possessions regimes, that specify compensation rates for service disruption (schedules 4 and 8 of the track access contracts)

- the governments specify high level outputs for Network Rail to deliver, for example relating to performance, capacity and network availability, and we translate these into regulatory obligations

- required delivery of certain major enhancements is also specified

- we specify additional elements to the incentives framework, for example a mechanism whereby operators share in gains in Network Rail's efficiency on a year by year basis.

For example, in the last periodic review (PR08)

- we determined a variable usage charge that was 35% below that for CP3

- we set separate passenger and freight targets for network availability, and targets for performance

- the process resulted in committed major programme of enhancements, including more than £250m funding for the strategic freight network

In enforcing the periodic review outputs, in January 2012 we issued Network Rail with an enforcement order in respect of poor freight performance, reflecting its failure to do all that it reasonably could to meet its regulatory targets. We required Network Rail to establish a 'recovery board' of its freight customers and to agree with the board the steps it needed to take to comply with its licence. This is a new approach, designed to put power in the hands of Network Rail's customers.

2.6 A key aim of any price control is to ensure that the regulated company (in this case, Network Rail) is as efficient as possible given the obligations on the company and the wider circumstances. In the context of the railway, this means maximising value for taxpayers, customers and society. To achieve this, industry reform will be crucial. We see PR13 as an important facilitator and driver of industry reform – in particular through:

(a) a clear **focus on what matters to passengers, freight customers and taxpayers** – particularly improving value for money;

(b) **a more disaggregated approach** – increasing transparency and access to information, facilitating greater localism, and supporting more disaggregation in the industry (for example, through Network Rail devolution) will provide for a more comparative approach to regulation and a better understanding of costs, revenues and subsidy across the sector;

(c) **alignment of incentives** – improving the interfaces between the different players in the industry, for example, by facilitating alliances, efficiency benefit sharing at the route-level and bespoke arrangements where these improve whole sector working, will drive greater value for money for customers and taxpayers; and

(d) **greater contestability** – ensuring that there is more effective use of market mechanisms through the value chain, including in the provision of infrastructure services where appropriate, delivering further efficiencies.

2.7 We will have regard to our objective and the above goals throughout PR13.

Periodic review process

2.8 PR13 follows the amended procedure for conducting an access charges review. This procedure was applied for the first time in PR08 after Schedule 4A to the Railways Act 1993 ('the Act') was amended by the Railways Act 2005. Schedule 4A requires the Scottish Ministers (for Scotland) and the Secretary of State for Transport (in respect of England & Wales) to provide us with information about what they want to be achieved by railway activities in Scotland and England & Wales during the control period and the public financial resources that are, or are likely to be, available for the achievement of those activities. They will each do this by each producing a 'high level output specification' (HLOS), setting out what they want to be achieved, and a 'statement of funding available' (SoFA), setting out how much public funding they intend to commit to the railways in the period.

2.9 We set out below an overview of progress to date and give a brief guide to the rest of the process, to put this document into context.

Preliminary work

2.10 In May 2011, we issued our first consultation document on PR13 seeking views on a wide range of issues to inform our thinking ahead of the formal 'review' phase' (May 2011 consultation)[13]. We followed this up with a consultation in December 2011[14] (December 2011 document), which asked stakeholders more detailed questions on financial framework and incentives issues ahead of our May 2012 framework document.

2.11 In September 2011, Network Rail with its industry partners published two 'Initial Industry Plans' (IIPs) – one for England & Wales and one for Scotland[15]. These set out the industry's strategies in England & Wales and Scotland for the long-term, with a focus on what could be delivered in CP5. Our analysis of the IIPs was a key component of our Advice to Ministers documents[16] which we issued in March 2012 (see below).

Advice to ministers and the formal commencement of PR13

2.12 In March 2012, we formally commenced the periodic review process and requested both the Scottish Ministers and the Secretary of State to submit their HLOSs and SoFAs to us by 31 July 2012. To assist the

[13] Periodic review 2013: first consultation, May 2011. This can be accessed at http://www.rail-reg.gov.uk/pr13/consultations/orr013.php.

[14] Periodic review 2013: consultation on incentives, December 2011. This can be accessed at http://www.rail-reg.gov.uk/pr13/consultations/orr020.php.

[15] *Initial industry plans 2011*, Network Rail, September 2011. This can be accessed at http://www.networkrail.co.uk/iip.aspx.

[16] Two separate documents were issued: the first to the Secretary of State for Transport (this can be accessed at http://www.rail-reg.gov.uk/pr13/PDF/pr13-advice-to-ministers-ew.pdf), the second to Scottish Ministers (this can be accessed at http://www.rail-reg.gov.uk/pr13/pdf/pr13-advice-to-ministers-scotland.pdf)

governments in producing their HLOSs and SoFAs, we provided each of them with advice on the likely range of expenditure that Network Rail will require to deliver its outputs in CP5 and thus the level of public funding that is likely to be required. We also provided advice on the possible structure of outputs in CP5. Our advice was based on our analysis of the industry's proposals for CP5 as set out in the IIPs, and informed by our own work on the scope for future efficiency improvement.

The financial and incentive framework for CP5

2.13 Our May 2012 framework document set out our decisions and approach on key aspects of the overall regulatory framework for CP5. The overall regulatory framework,and the decisions we will finally take on efficiency and outputs, have a significant impact on Network Rail. When we make our decisions, which we will set out for consultation in our draft determinations in June 2013, we will establish a balanced package that is challenging but achievable for Network Rail. We will need to ensure that we appropriately balance the incentives we place on the company to deliver and outperform our determination along with the mechanisms we establish to manage certain types of risk.

2.14 The overall framework will also affect train operators (and other parts of the industry such as suppliers and ROSCOs), for example through the incentive mechanisms we establish. It thus provides a strong basis to drive improved value for money from the industry as a whole.

Following the HLOS: consultation on Network Rail's outputs and the wider framework of enablers and key performance indicators (KPIs)

2.15 Once the HLOSs and SoFAs have been submitted to us by 31 July 2012, we will need to consider how to translate the high-level outputs sought by the governments into the regulatory obligations that we will place on Network Rail and for which we will monitor and enforce delivery in CP5. To assist us in doing this, we will be consulting in August 2012 on the outputs that Network Rail should be required to deliver, and also on KPIs that we could use to monitor delivery of outcomes more widely.

Network Rail's strategic business plan (January 2013)

2.16 Following the issue of the HLOS, Network Rail will begin work on its strategic business plan (SBP) for CP5, which will be its proposal for delivering the high-level outputs that the governments wish to buy. This will include Network Rail's costing of these outputs. The production of the SBP, whilst being Network Rail's responsibility, will be carried out through a collaborative process with stakeholders[17]. A key part of the SBP for CP5 will be detailed plans for each of Network Rail's operating routes.

2.17 We have provided guidance to Network Rail on how it should produce its SBP[18]. In particular, we have asked Network Rail to:

(a) clearly describe the outputs it will deliver in CP5, explaining how these meet customers' reasonable requirements and link to the wider outcomes it expects them to achieve;

(b) set out route-level plans, with a consolidated England & Wales plan (as well as a separate plan for Scotland) and with key data presented at a GB level;

(c) focus on CP5 but in the context of a separate longer-term strategic direction statement for Network Rail; and

[17] When we issued our advice to ministers, we issued guidance to Network Rail setting out our requirements for its SBP. This included how it should engage with stakeholders.

[18] *Requirements for Network Rail's January 2013 strategic business plan*, ORR, March 2012. This can be accessed at http://www.rail-reg.gov.uk/pr13/PDF/network-rail-2013-sbp-requirements.pdf.

(d) engage with its stakeholders (including train operators, passengers, freight customers, suppliers and other stakeholders) in the development of the SBP, and set out in the plan the input it received and how it has taken this into account.

2.18 Network Rail will publish its SBP by 7 January 2013. We will then begin our comprehensive review and challenge of the SBP. We plan to give stakeholders an opportunity to provide us with any comments they have on the SBP, which will help inform our analysis as we scrutinise the SBP in the run up to producing our draft determinations. This echoes the approach we took following the production of the IIPs. We will not consult formally on Network Rail's SBP on the basis that the SBP is Network Rail's document, which, in line with our guidance, will have been prepared on the basis of consultation with its stakeholders.

Draft determinations (June 2013)

2.19 Our draft determinations, to be published in June 2013, will set out our proposed decisions on Network Rail's outputs in CP5 and the funding that we consider it will need to deliver these outputs efficiently. Our draft determinations will also set out our draft decisions on the wider regulatory framework, including the incentives that will act on Network Rail to encourage it to deliver and outperform our determination and the incentives that will act on other industry parties including train operators (and through both Network Rail and train operators, suppliers and ROSCOs).

2.20 At the same time that we publish our draft determinations, we will issue a draft 'strategic regulatory statement'. This will set out how we see our draft determination linking to the long-term future of economic regulation in the rail industry.

Final determinations (October 2013)

2.21 We will carry out a full consultation on our draft determinations over the summer of 2013, providing for Network Rail, train operators and other stakeholders to make representations to us on the decisions we propose to make. We will also consult on our draft strategic regulatory statement. Following due consideration of stakeholder responses, we will make our final decisions in October 2013, when we publish our final determinations and issue our strategic regulatory statement.

Rail value for money study

2.22 On 19 May 2011, we published the final report of the RVfM[19], led by Sir Roy McNulty,which we commissioned jointly with the Department for Transport (DfT). The RVfM study highlighted both the growth opportunities for the industry, through the rising demand for rail, but also, critically, the value for money challenge that the whole rail industry faces and the need to respond to this for passengers and taxpayers. This challenge is even more urgent today given the economic climate and the financial pressures on government, passengers and businesses.

2.23 The RVfM study 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. The industry, led by the Rail Delivery Group (RDG), is taking forward a programme of changes to help deliver these savings. The Secretary of State published a command paper[20] in March 2012 partly in response to the RVfM study, setting out the changes that the government wished to see in respect of England & Wales. Whilst

[19] *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. .

[20] *Reforming our Railways: Putting the Customer First*, Department for Transport, March 2012. This can be accessed at http://www.dft.gov.uk/publications/reforming-our-railways/.

Transport Scotland was not a co-sponsor to the RVfM study, it recognises that there will be implications for the rail industry across the whole of Great Britain from the work of RDG and potential benefits arising from this. The key messages from the DfT command paper are summarised in the next section.

2.24 We are carrying out PR13 within a wider context of industry reform, following the recommendations of the RVfM study. Whilst our regulatory focus is on Network Rail, we will do what we can to influence the wider industry to deliver the savings identified in the RVfM study; using, as part of PR13 and beyond, the regulatory tools available to us including the promotion of market mechanisms and transparency (such as through our work on whole industry costs and benchmarking of train operators as well as the different parts of Network Rail). Nonetheless, it will be crucial for the industry as a whole to play its part in supporting the achievement of these savings, including through government-led changes that facilitate the industry being able to operate more efficiently.

2.25 The RVfM study[21] recognised the productivity and efficiency improvements made by freight in a competitive market but also stated that "freight can contribute to value for money by maintaining its flexibility of operation, using the network capacity more effectively, identifying routes that do not require to be maintained for freight services and demonstrating to the rest of the industry the techniques it has employed to improve productivity."

2.26 The industry, in its initial industry plans, set out opportunities to improve the value for money of the rail freight sector. It said that the industry will examine opportunities including[22]:

(a) reviewing operating flexibility in the context of rigid passenger timetables;

(b) reviewing operations during the periods of peak passenger operation around London;

(c) maximising the length of each train so as to move a given volume of freight in the least number of network paths;

(d) relinquishing unused paths, although the RVfM study acknowledges the need for strategic freight capacity and flexibility in freight path provision to accommodate the diversions required by engineering work and the volatile nature of the freight market;

(e) supporting reform of industry processes to accelerate changes to capacity allocation and network capability;

(f) amending operating practices to minimise the impact of freight trains on low volume/low maintenance branch lines; and

(g) agreeing to the removal of freight capability on some route where there is no prospect of freight activity and which can be downgraded to accommodate light weight passenger trains with commensurate savings in track maintenance and renewal costs

The rail freight industry in GB

2.27 Rail freight is strategically important to the national economy, for example:

[21] *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.

[22] On Network Rail's PR13 web page.

(a) around 25% of the electricity consumed in the UK is generated by coal that has been moved by rail. 16% is generated by nuclear power, the spent products from which depend on rail for safe disposal[23];

(b) rail moves aggregates and cement into major conurbations. In London, over 40 per cent of such raw materials are delivered by rail;

(c) 28% of all deep sea containers that arrive or depart from the major ports are transported by rail.

2.28 Rail freight has wider benefits for the economy and society. Without rail freight, the VfM study stated that there would have been an additional 6.7m road journeys in 2007-08. Switching from HGV to rail saves 70% of CO_2 emissions, and on average 28 pence per HGV mile in road decongestion benefits.

2.29 Rail freight accounts for 7% of the train km on the GB network, but 20% of the tonne km. Figure 2.1 shows the substantial rise in rail freight over a number of years. In 2010-11 19.2 billion net tonne-km were moved by rail, consisting of:

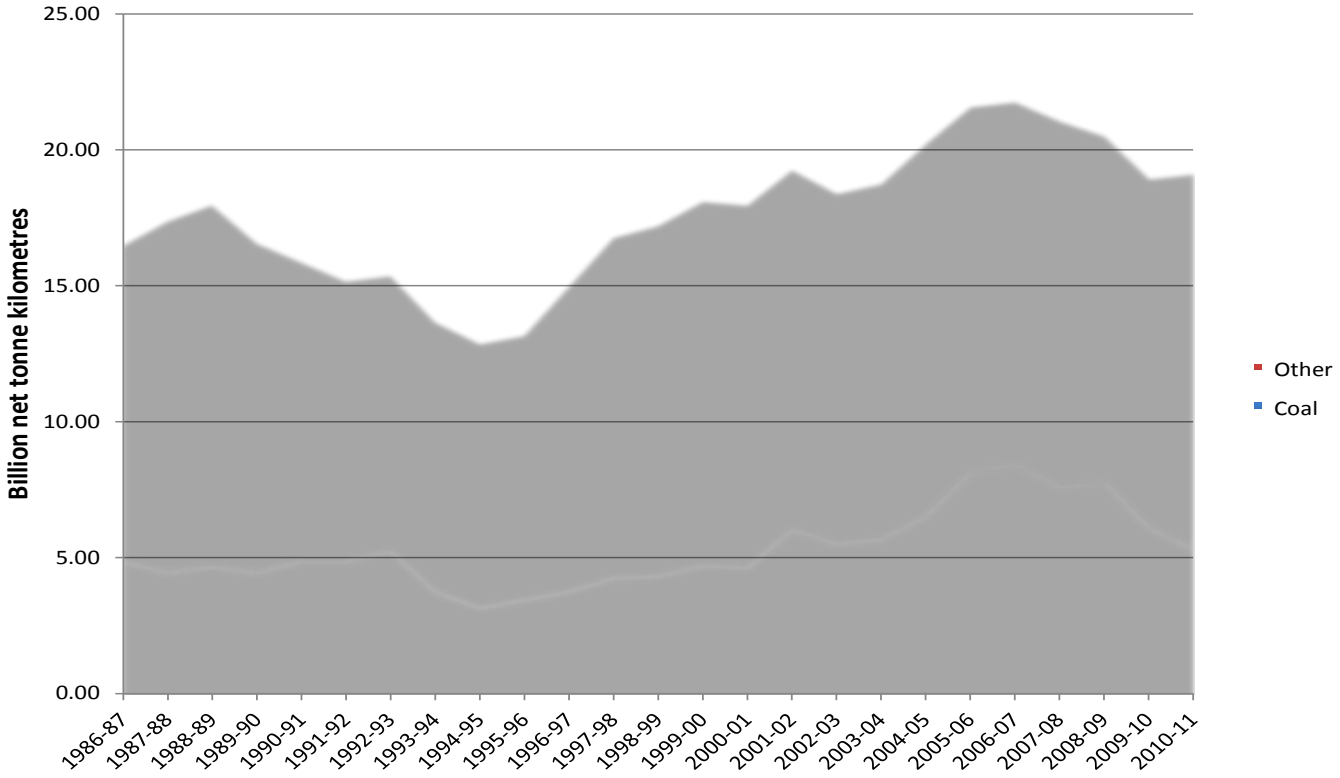
(a) coal (29% of total volumes in 2010-11);

(b) domestic intermodal (30% of total volumes); and

(c) other commodities, primarily metals, goods for construction and oil/petroleum products (41% of total volumes).

2.30 While in 2005-06 coal accounted for 38% of total rail freight volumes, this proportion had declined to 29% by 2010-11. To a large degree, this has been offset by substantial growth in intermodal traffic.

Figure 2.1: Goods moved by rail



[23] Statistics in this section are taken from Section 13.6 of the Rail Value for Money (RVfM) Study unless otherwise stated.

2.31 The majority of the demand for UK coal is for use in electricity supply industry, around 83%, with the remaining 17% used in the iron and steel sectors. As a result future levels of coal fired generating plant and output are a key determinant of the demand for rail freight transporting coal. Demand for ESI coal has been in long term decline due to the impact of EU and UK Government policies and legislation to reduce harmful emission from coal such as CO_2 and Nitrogen Oxide.

2.32 DECC forecasts that by 2020, demand for ESI coal will be in the range of 30-40 million tonnes per annum[24]. This compares to around 38m tonnes in 2009-10.

Support for rail freight

2.33 In the March 2012 DfT command paper on rail[25], the UK government described its ongoing support for rail freight as follows:

(a) "Government will consider further investment in the Strategic Freight Network (SFN), both to help make best use of the existing network and, by increasing its freight capability, to leverage continued private sector investment in rail freight growth;

(b) Government is continuing to provide support through the MSRS scheme to shift freight from road to rail where there are overall environmental and social benefits from doing so; and

(c) Government will provide a clear planning policy framework to support further private sector investment in rail freight terminals and rail-connected distribution parks, including Strategic Rail Freight Interchanges (SRFIs[26]), to support growth."

2.34 The command paper also noted:

(a) Network Rail's work with the industry to safeguard strategic freight capacity and to facilitate strategic investment in SRFIs;

(b) that Network Rail has now appointed a freight director to provide a single interface for freight, in the context of greater devolution within Network Rail; and

(c) ORR plans to:

(i) give the freight industry early assurance over the level of access charges, by setting a cap on these; and

(ii) consider the scope for mark-ups on Network Rail track access charges for freight trains (for example, those serving the nuclear and electricity supply industries (ESIs)) which could help to cover a greater share of the costs associated with their use of the network."

2.35 The Scottish Ministers support the rail industry in Scotland through infrastructure investment, in line with the transport priorities set out in the Strategic Transport Projects Review[27]. The Scottish Government

[24] Update Energy and Emissions Projections 2011, DECC October 2011

[25] See paragraph 4.46 onwards of *Reforming our Railways: Putting the Customer First*, Department for Transport, March 2012. This can be accessed at http://www.dft.gov.uk/publications/reforming-our-railways/.

[26] See paragraph 4.46 of *Reforming our Railways: Putting the Customer First*, Department for Transport, March 2012. This can be accessed at http://www.dft.gov.uk/publications/reforming-our-railways/.

remains committed to encouraging modal shift of freight from roads to the less environmentally damaging modes of rail and water. The Future Transport Fund budget over the next three years, to 2014/15, includes an allocation of £7.25 million to fund freight modal shift projects through the Freight Facilities Grant scheme. In addition, like the UK Government, the Scottish Ministers continue to offer Mode Shift Revenue Support Grant to encourage the use of both water and rail for freight. £3.3 million has been allocated to the Support for the Freight Industry budget to support this grant scheme in Scotland over the three years to 2014-15.

2.36 Over the current control period (CP4) rail freight has benefited from a significant programme of freight specific enhancement schemes. 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 government has committed over £200m to support this programme which includes for example gauge enhancement on the Felixstowe to Nuneaton and Southampton to West Midlands to allow for larger containers to be carried by intermodal traffic. Freight has also benefited 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.

Current structure of charges

2.37 One of our key aims for PR13 is to facilitate and encourage the alignment of incentives across the industry, in the best interests of passengers, customers and taxpayers. Access charges determined through PR13 are an important part of the industry incentive framework, and also part of the interface between Network Rail, passenger and freight train operators.

2.38 Charges have the potential to serve four purposes. They provide:

a) a mechanism for Network Rail to recover the efficient costs it incurs in providing track and station infrastructure used by train operators;

b) a means to allocate costs to, and be recovered from, those that cause those costs to be incurred;

c) signals to train operators, their suppliers and funders for the efficient use and development of vehicles and the infrastructure (subject to other policy objectives and constraints); and

d) incentives to Network Rail to outperform the regulatory determination (through a form of price cap regulation that is applied).

2.39 Network Rail has responsibility for calculating existing charges in line with our charging objectives and guidance. We retain responsibility for developing new charge proposals, and we will also audit and approve final charges.

2.40 Our specific charging objectives are as follows:

a) promote the objectives of our duties under section 4 of the Act and be consistent with the wider objectives of funders;

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[27] See www.transportscotland.gov.uk/stpr This document was published in 2008.

b) incentivise Network Rail, train operators, train manufacturers, ROSCOs and funders to ensure the efficient utilisation and development of the network and the optimisation of whole industry costs;

c) not discriminate unduly between users of the network;

d) be practical, cost effective, comprehensible and objective in operation;

e) be consistent with relevant legislation, including the European Union (EU) Directive 2001/14/EC;

f) reflect the efficient costs caused by use of the infrastructure (both to Network Rail or otherwise); and

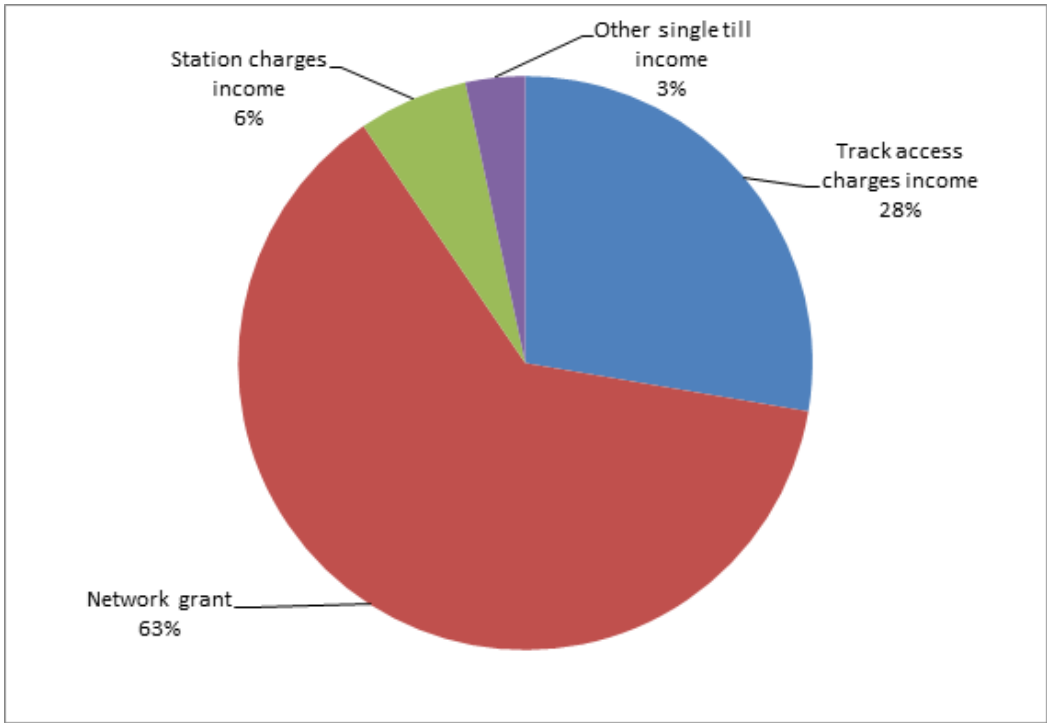
g) ensure that charges enable Network Rail to recover, but not to over-recover, its allowed revenue requirement.

2.41 In accordance with EU legislation, track access charges are calculated on the basis of costs directly incurred. Mark-ups are permitted by EU legislation to be levied on these charges, provided that they comply with various principles and that their effect is not to exclude the use of infrastructure by market segments which can pay at least the costs directly incurred plus a rate of return which the market can bear.

2.42 In CP4, only around a third of Network Rail's income comes from track access charges and station charges (Figure 2.2). The fixed track access charge, paid by franchise operators, accounts for around 60% of charging revenue (Figure 2.3).

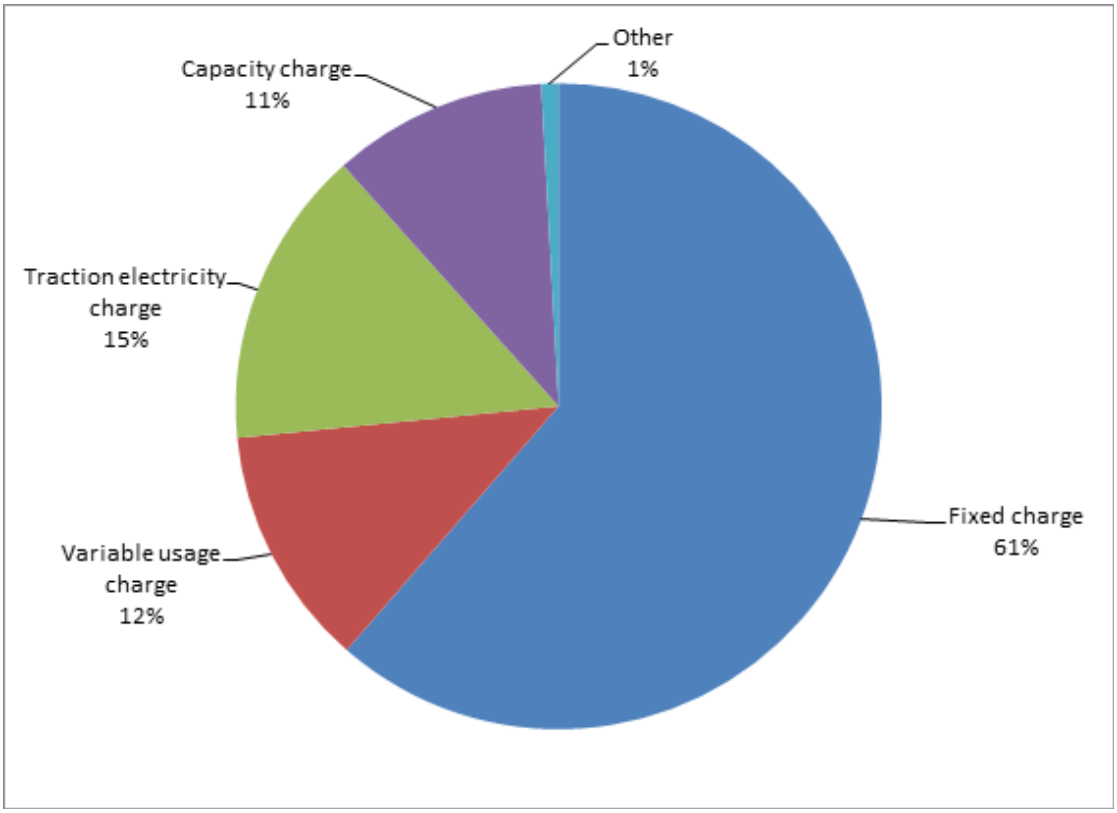
2.43 The network grant and fixed charges make up more than 80% of Network Rail's revenue, are fully determined by the periodic review (except for adjustments for inflation), and are backed by a government guarantee. The variable charges are important in policy terms, therefore, primarily as a tool for incentivising efficient behaviour of the operators and Network Rail, rather than in terms of the revenue they generate.

Figure 2.2: Total Network Rail income GB-wide 2010-11



Source: Network Rail Regulatory Accounts, ORR analysis

Figure 2.3: Network Rail track access charges income GB-wide 2010-11



Source: Network Rail Regulatory Accounts, ORR analysis

Table 2.1: Network Rail GB-wide revenue

Charge	Purpose of charge	Actual Income £millions)
Variable usage charge Of which: - passenger - freight - open access	Recovers maintenance and renewal costs that vary with traffic	182 137 41 4
Traction electricity charge (passenger and freight)	Recovers the costs of providing electricity for traction purposes	226
Capacity charge (passenger and freight)	Recovers the increased costs incurred by Network Rail as a result of increased traffic on the network	162
Fixed track access charge (passenger and freight)	Determined on a basis of Network Rail's total revenue requirement	912
Other (electrification asset usage charge; coal spillage charge)	Recovers associated costs	13
Station long term charge	Recovers station maintenance, repair and renewal	135
Network Grant	Paid direct by Government in lieu of fixed charges	3,779
Total, charges and network grant		**5,409**
Total Network Rail revenue	Also includes property income, for example	**6,020**

Source: Network Rail Regulatory Accounts, ORR analysis

2.44 Table 2.2 lists the access charges and associated income for freight train operators in 2010-11, excluding performance regime payments. The variable usage charge revenue includes revenue from the freight-only line charge, which applies to ESI coal and spent nuclear fuel traffic. The associated revenue from the freight-only line charge is capped at around £5 million, but in practice may be less than this.

Table 2.2: Freight access charges income in 2010-11

Type of charge	Actual income (£ millions per annum)
Variable usage charge, including the charge for freight-only lines	41
Traction electricity charge	5
Capacity charge	4
Coal spillage charge	5
Freight connection agreements and other income	1
Total	**55**

Source: Network Rail Regulatory Accounts, ORR analysis

2.45 Tables 2.1 and 2.2, taken together, show that current income from freight access charges represents less than 1% of Network Rail's total income.

2.46 As part of PR13, we are considering reforms through the workstream described in this document, to the structure of track access charges. Broader issues associated with access charges, which are addressed as part of our periodic review, are presented in Chapter 5 of our PR13 framework document[28].

[28] *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/upload/pdf/financial-incentive-framework-cp5.pdf

3. Variable usage charge

Key messages from this chapter

- The variable usage charge is designed to recover Network Rail's maintenance and renewals costs that vary with traffic.

- In order to give an early indication of levels of charges for the next control period, we asked Network Rail to estimate its variable costs and hence a likely range for the average variable usage charge. 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 or price base. Taking account of the changes it has made in response to its earlier consultation and the review of the independent reporter[29], we are broadly content with Network Rail's work on this to date.

- We highlight here that there are substantial differences in Network Rail's estimates of variable costs as a proportion of total costs as compared to estimates for other European railways. We are investigating this further, but continue to consider that Network Rail's bottom-up forward-looking approach to be better suited to estimating the costs we are seeking to measure than the top-down approaches used elsewhere. We are therefore proposing to set a cap on the variable usage charge on the basis of Network Rail's analysis.

- We are proposing a cap on the average variable usage charge, across all passenger and freight services, at £1.79per kgtkm (2011-12 prices) for end CP4 efficiency. This is the best estimate of £1.56 per kgtkm plus a band of uncertainty of 15%. The charge would then be adjusted for determined improvements in Network Rail's efficiency, and our analysis to date suggests the associated reduction in the charge exceeds 15%.

- Network Rail has proposed a cap specific to freight services. We have announced our intention to implement a variable usage charge that is geographically disaggregated, but these proposals are as yet insufficiently advanced for us to be able to propose a cap specifically for freight services that would hold for a geographically disaggregated charge. However, we also recognised that it may not be possible to implement such geographically based charging at the start of CP5. Instead, therefore, we are proposing a variable usage charge cap for freight services that would hold for a

[29] The reporters are independent experts who provide us with assurance of the accuracy and reliability of Network Rail's information.

nationally-based charge. The cap is as per Network Rail's proposal: £1.68 per kgtkm (2011-12 prices) for end CP4 efficiency[30], which is £1.46 per kgtkm plus a 15% confidence band.

Introduction

3.1 This chapter sets out the work done so far to estimate average variable costs, expressed as £ per gross tonne km. It is part of the process for determining the variable usage charge (VUC) in PR13. We are using the consultation and its associated conclusions to provide the industry with an early indication of the likely scale of the charge for the next control period

3.2 This consultation on the VUC relates to the average charge, across all vehicles and geographies. It is not about how the charge may be differentiated by vehicle or by part of the network. The latter work is discussed in "Setting the financial and incentive framework for Network Rail in CP5", which we published earlier this month[31].

3.3 This chapter:

(a) provides the industry with our best assessment of these costs to date and the uncertainty associated with refining these estimates further in PR13;

(b) building on Network Rail's November 2011 consultation on freight caps[32], invites consultees to make us aware of any new considerations not already taken into account in Network Rail's conclusions to its consultation and our review of that consultation;

(c) explains how these costs will relate to the VUC that we will determine, including further work to be undertaken as part of PR13; and

(d) discusses the uncertainties associated with this further work and consults on our proposal for setting a cap.

3.4 Network Rail consulted on the costs of freight-only lines at the same time as consulting on this charge, and we discuss costs associated with freight-only lines in chapter 5.

The current charge

3.5 The VUC is designed to recover Network Rail's operating, maintenance and renewals costs that vary with traffic; in economic terms this reflects the short run marginal costs, or variable costs.

3.6 The charge is paid by all operators. It varies by type of vehicle, according to the estimated infrastructure wear and tear costs associated with the vehicle, but a uniform rate is applied GB-wide. Network Rail's associated revenue in 2010-11 from franchise passenger operators, open access passenger operators and freight operators was £137 million, £3.6 million and £41.4 million respectively. The charge is levied per vehicle mile for passenger vehicles or thousand gross tonne miles (kgtm) for freight. For 2010-11, the charge was on average around £0.50 per train mile for passenger services, and around £1.60 per kgtm for freight services.

[30] The actual charge will be adjusted downwards to take account of the efficiency target we will determine for Network Rail.

[31] *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/upload/pdf/financial-incentive-framework-cp5.pdf.

[32] Network Rail's consultation documents can be accessed at http://www.networkrail.co.uk/PeriodicReview2013.aspx.

3.7 The VUC is currently highly disaggregated by vehicle class and, in the case of freight, commodity type. This differentiation reflects the significant variation in infrastructure wear and tear costs associated with different vehicle classes. The disaggregation provides economic signals to freight operators, train operators and their funders, and rolling stock manufacturers, so that decisions regarding vehicle specification and deployment can be made broadly on the basis of minimising whole-industry costs. Since PR08, the industry has worked together to develop cost-reflective charges for modified vehicles, so that operators can benefit from adapting their vehicles to be more track-friendly, thereby reducing whole-industry costs.

3.8 The VUC is based on GB-wide average usage costs, and this leads to the charge for a certain class of vehicle being the same regardless of whether, for example, it runs on the West Coast Main Line, a branch line in Scotland or a freight-only line. In this respect it differs from the other main track access charges which have some degree of geographical disaggregation.

3.9 The VUC (for both freight and passenger operators) has historically been estimated as a two stage process, and these two stages are also being used for PR13:

(a) first, total variable costs are estimated, primarily using estimates of the track damage caused by a notional "average" vehicle; and

(b) second, the relationship between each specific vehicle's characteristics (relative to an average vehicle) and track damage is analysed, to allow us to estimate charges for each vehicle type.

3.10 By combining the two stages we calculate individual charges by vehicle type. Network Rail has already conducted extensive work on the first of these two stages, which is described in this chapter. To provide context for Network Rail's analysis, we first summarise recent industry research and empirical analysis of cost variability.

3.11 All figures set out in the remainder of this chapter are expressed in 2011-12 prices, assuming determined efficiency levels as at the end of CP4, unless explicitly stated otherwise.

Cost variability for rail assets

3.12 Historically, research by Network Rail and other industry bodies showed that a charge set to reflect costs directly incurred would only recover a small proportion of total costs.

3.13 The majority of variable costs are associated with track and substructure, but some costs for signalling and certain civils assets vary with traffic. For example, during PR08, Network Rail identified that renewals costs for metallic underbridges increase when heavy wagon types are operated over them. In PR08 Network Rail estimated that 20% of renewals costs for metallic underbridges vary with traffic.

3.14 RSSB published the results of research in February 2012 on how railway traffic impacts on embankments (particularly those in higher plasticity soil types)[33], and found evidence that suggests costs vary with traffic. Also, recent research commissioned by Network Rail to monitor and model the effects of heavy traffic on structures has confirmed previously-observed evidence of damage (and hence the level of

[33] *The effects of railway traffic on embankment stability*, RSSB, February 2012. This can be accessed at http://www.rssb.co.uk/SiteCollectionDocuments/pdf/reports/Research/T679_rb_final.pdf.

additional maintenance and renewal costs) to the arches of masonry bridges, apparently caused by certain heavily-loaded four-axle bogie freight wagon types. Network Rail then estimated costs for the resulting maintenance and renewal interventions likely to be required, based on its modelling and actual costs for the Settle-Carlisle line – which had required these interventions following the introduction of heavily-loaded freight trains.

3.15 It appears from this recent research that the relatively recent introduction of certain freight wagon types onto the network has caused damage to bridges and embankments that would not otherwise have occurred - and therefore that this freight traffic has generated increased costs for Network Rail. One explanatory factor is that these new four-axle wagon types tend to concentrate load at discrete intervals corresponding to the bogie centres. While the impacts of this damage are not yet fully understood and are currently being investigated, engineering principles and recent research suggest that these freight wagons have caused masonry bridges and embankments to exceed their "fatigue limit". Below this level, these civils assets would have very low variable costs.

3.16 It appears therefore that these wagon types have pushed certain civils assets into a zone where fatigue and hence damage is likely through continued, cyclical pressure on the bridges and embankments. We consider that Network Rail could not have fully anticipated these impacts as previously there was less risk of these assets exceeding their fatigue limits.

Network Rail's analysis and consultation on variable costs

3.17 In our May 2011 PR13 consultation we sought views on whether we should reach an early decision on whether to place a cap on freight charges. Responses to this consultation question were generally positive. We then asked Network Rail to initiate its work to estimate costs that could be used to inform a cap, if we choose to introduce one.

3.18 The overall purpose of the work was to calculate initial cost estimates that could inform our early caps on CP5 freight VUCs and freight-only line charges. As freight variable usage costs are a subset of total (passenger and freight) variable usage costs, the methodology that Network Rail employed is relevant to both freight and passenger operators. Hence, although the primary purpose of this work was to estimate freight variable usage costs, Network Rail also aimed to be transparent about the initial variable usage cost estimates associated with passenger traffic.

3.19 Network Rail formally commenced this work on variable costs through a September 2011 letter to the industry, which set out its proposed methodology for calculating initial cost estimates that could inform the caps on charges[34]. On 19 October 2011 Network Rail presented its emerging analysis to stakeholders at the monthly variable track access charges (VTAC) meeting. Network Rail has continued to brief this forum as a way of augmenting industry consultations on VUCs and freight-only line charges during PR13[35].

3.20 In November 2011, Network Rail issued a consultation, containing its calculations of initial VUC and freight-only line charge cost estimates[36]. It did this using broadly the same methodology as in PR08. That

[34] *PR13 – Freight caps*, Network Rail, September 2011. This can be accessed at http://www.networkrail.co.uk/uploadedFiles/networkrailcouk/Contents/Publications/Delivery_Plans/Control_Period_5_delivery_plan/Planning_for_CP5/FreightCapIndustryLetter.pdf.

[35] This is set out in Network Rail's December 2011 letter on engaging with customers on structure of charges, which can be accessed at http://www.networkrail.co.uk/PeriodicReview2013.aspx.

[36] *Freight caps – consultation on variable usage charge and freight-only line charge initial cost estimates*, Network Rail, November 2011. This can be accessed at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064779042.

methodology uses a 'bottom-up' approach to estimating track variable usage costs, reflecting the relative importance of track costs. In order to derive these bottom-up estimates, Network Rail used the Vehicle Track Interaction Strategic Model (VTISM), which was developed for the cross-industry Vehicle/Track Systems Interface Committee (V/T SIC)[37]. VTISM directly relates rolling stock and track characteristics to track damage, and thus to renewal and heavy maintenance requirements. VTISM uses engineering principles, embodied in numerical relationships, to predict track degradation and the remedial effects of heavy maintenance and renewal.

3.21 By contrast, Network Rail has taken a "top-down" approach to estimating non-track (civils and signalling) variable usage costs.

3.22 Network Rail's analysis considered cost variability for these three asset classes as follows:

(a) Track: analysis of maintenance and renewals costs;

(b) Civils: renewal costs for embankments, underbridges and culverts; and

(c) Signalling: maintenance and points renewals for minor works.

3.23 As part of this work, Network Rail also estimated costs for freight-only lines and proposed confidence intervals around its cost estimates, which would inform the levels of the caps.

3.24 To allow discussion of the issues raised in the November consultation document, Network Rail hosted an Industry Workshop on this work on 6 January 2012.

Network Rail's March 2012 conclusions

3.25 Following receipt of consultation responses, Network Rail concluded on this work in March 2012 through a letter[38] which summarised its conclusions and its responses to the key issues raised in consultation responses. Consultees generally supported the principle of an early cap on freight charges and were content with the approach to allocating VUCs between freight and passenger traffic. However, consultees generally believed that Network Rail's proposed confidence interval of +/-20% for its estimates to be rather high. They requested more information in relation to estimates of cost variability for signalling and civils asset classes. Consultees also raised concerns about the robustness of Network Rail's track model for scenarios in which traffic reduces, and on the detailed modelling of costs for freight-only lines.

3.26 Network Rail's resulting estimates of variable usage costs for each of the three asset classes (track, signalling and civils), are shown in Table 3.1, broken down by asset sub-class. The estimates are shown both in absolute terms and as a proportion of variable usage costs.

[37] Information about this committee and its aims can be found at: http://www.rssb.co.uk/groups/SIC/VTrack/Pages/default.aspx

[38] *Freight caps – conclusion on November 2011 consultation in relation to variable usage charge and freight-only line charge initial cost estimates*, Network Rail, March 2012. This can be accessed at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064781028.

Table 3.1: Network Rail's variable usage cost estimates (£million per annum at 2011-12 prices, assuming end CP4 efficiency levels)

Asset type	Costs (£m per year)	Costs as % of total
Track	**242.4**	**86%**
Track maintenance and renewals	242.4	86%
Civils	**25.5**	**9%**
Embankments renewals	1.9	1%
Metallic underbridge renewals	9.7	3%
Brick and masonry underbridge renewals	13.3	5%
Culverts renewals	0.5	0%
Signalling	**13.6**	**5%**
Maintenance	8.2	3%
Minor works points renewals	5.4	2%
Total	**281.5**	**100%**

Source: Network Rail March 2012 conclusions[39], table 1, and ORR analysis. Note that figures may not sum exactly because of rounding.

[39] *Freight caps – conclusion on November 2011 consultation in relation to variable usage charge and freight-only line charge initial cost estimates*, Network Rail, March 2012. This can be accessed at http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064781028.

3.27 Table 3.1 shows that (according to Network Rail) the track asset class is responsible for 86% of the costs that vary with usage, while costs relating to civils assets comprise a further 9% of variable costs. The estimates of variable costs are 5% to 7% higher than that for CP4, reflecting the inclusion of new assets now understood to have variable cost elements, such as certain types of bridges. Network Rail is continuing to refine its cost estimates.

3.28 In order to estimate an initial level for the caps on charges, Network Rail applied the following assumptions:

- apportion costs between freight and passenger traffic based on the relationship between gross and equivalent tonnage in the CP4 VUC model; and
- cap freight variable usage charges in the form of a maximum £ per kgtkm rate.

3.29 These principles, and the cost estimates shown above, led to estimates of average cost rates on a comparable basis as follows[40]:

- the freight and passenger average vehicle cost rate rising from £1.47 per kgtkm in CP4 to £1.56 per kgtkm, an increase of 6% compared to the CP4 rate;
- the freight vehicle cost rate rising from £1.36 per kgtkm in CP4 to £1.46 per kgtkm, an increase of 7% compared to the CP4 rate; and
- the passenger average vehicle cost rate increasing from £1.52 per kgtkm in CP4 to £1.60 per kgtkm, an increase of 5% compared to the CP4 rate.

3.30 Network Rail also estimated an initial confidence interval around its cost estimate of +/-15% to inform the level of caps. Uplifting the updated freight average vehicle cost rate by 15% results in a value of £1.68 per kgtkm.

3.31 We commissioned the independent reporter Arup to review Network Rail's work. Their findings are described in the next section.

Arup review of Network Rail's variable cost estimates

3.32 During the consultation period following Network Rail's November 2011 letter to the industry, we asked the reporter Arup to carry out a high-level review of Network Rail's calculations of initial cost estimates[41].

3.33 The reporters are independent experts appointed by Network Rail with our approval. They provide ORR with professional advice regarding Network Rail's performance and stewardship of the network. There are three reporters, of which Arup is one. Arup currently has responsibility for reviewing Network Rail's data to provide us with assurance of the accuracy and reliability of its information.

3.34 We asked Arup:

[40] All figures expressed in 2011-12 prices, at end of CP4 efficiency levels.

[41] *Review of analysis in Network rail's 'freight cap' consultation*, Arup, March 2012. This can be accessed at http://www.rail-reg.gov.uk/upload/pdf/review-analysis-nrs-freight-cap-consultation.pdf.

- to review Network Rail's initial analysis underpinning its consultation on freight caps; and
- to advise on the robustness of the cost estimates, and associated uncertainties underpinning the estimates.

3.35 Arup's summary assessment of Network Rail's analysis for each asset was that:

(a) for track, Network Rail's calculations were based on the well-developed VTISM model. They found no computational errors, and were generally happy that the data used was consistent and well-based;

(b) for structures, Network Rail's assessment was based purely on engineering judgement with no firm evidence on quantified impacts. This was a "red flag" area, which means it was an area of major concern, and requires follow-up;

(c) for earthworks, Network Rail's assessment was again based on engineering judgement with no firm evidence on quantified impacts. This was another "red flag" area which raised major concerns and requires follow-up;

(d) for signalling, Arup were happy that, although Network Rail had used some engineering judgement, the impacts were broken down into constituent parts in a logical way and appropriately documented.

3.36 Arup suggested an overall rating for Network Rail's analysis of "yellow", which indicates that Arup has some concerns on method, data or assumptions, but no fundamental concerns with the results or method.

3.37 Arup also assessed Network Rail's proposed confidence interval for its estimates. Arup believed that a confidence interval of 20% (as proposed by Network Rail in its November 2011 consultation letter), might be "on the high side". However, Arup also noted uncertainty relating to the allocation of variable costs to passenger and freight.

ORR's review of Network Rail's analysis

3.38 We have reviewed how Network Rail responded to the issues raised during the consultation and identified by Arup, and are broadly content with its responses. Consultees raised some specific issues which Network Rail has not addressed at the time of the consultation. These specific issues, with details on how they have been addressed or how we expect that they will be addressed, are set out below.

3.39 Consultees asked for more detailed analysis to enable understanding of what proportion of Network Rail's operating, maintenance and renewals costs account for variable usage costs. Consultees wanted further justification for the calculations used, including those based on engineering judgement, to derive the variable proportion of the costs, in order to provide more certainty that this approach remains rigorous and valid. On the basis of the reporter's review (discussed below), our own knowledge of Network Rail's cost estimates and models, and our review of Network Rail's consultation and conclusions, we consider that the analysis Network Rail has carried out, provides a robust basis for variable cost estimation at this stage. However, we agree with consultees that Network Rail should refine its estimates of cost variability for non-track assets, and recognise that for its March 2012 conclusions it did so to some degree. We are asking Network Rail to do further work in this area, as we set out in paragraph 3.56 below.

3.40 Consultees wanted further assurance on the rigour of the specific models used to estimate the variable usage charge. For instance, a number of respondents were concerned that VTISM is unreliable in modelling scenarios under which traffic declines. Network Rail has tackled this issue by making changes

to VTISM, and applied these to develop a scenario of declining traffic. We note that the reporter advised that the changes Network Rail made to VTISM have successfully addressed this issue, and we accept this.

3.41 One consultee (Rail Freight Group) was concerned that Network Rail's modelling approach does not produce any results for freight by route or by sector, and that Network Rail does not have accurate data for modelling freight-only line costs. Network Rail has separately prepared some analysis for us, which shows that average track variable usage costs differ considerably by route. We consider that further work is required to better understand the level of variability, and are asking Network Rail to explain how it will progress this issue, in conjunction with the industry working group, which is now meeting regularly to agree an approach to modelling charges by vehicle.

3.42 Network Rail consulted on a 20% confidence interval on its estimates of the average variable usage charge. This would mean that the cap was set 20% higher than its best estimate of the charge. Some consultees responded arguing for a reduced confidence interval (10%) on the basis of factors including the wide industry confidence in VTISM. Network Rail concluded by proposing a 15% confidence interval, and explaining the change in part through new evidence regarding the robustness of its cost models. The reporter considered the overall rating of uncertainty to be yellow (reflecting some concerns but no major concerns), and thought that a confidence interval of 20% was high in this context but appropriate if the uncertainty of allocation between passenger and freight services is taken into account.

3.43 Having discussed this with the reporter, however, we understand that their assessment is the confidence interval of the estimated costs relative to the actual costs, whereas in setting the cap we are interested in the confidence interval for the estimated costs and charges relative to the costs and charges that we will ultimately determine. We think that this classification is within a narrower band, because some measurement and modelling errors will feature in both estimates. Therefore, we consider that the reporter's assessment of the confidence interval may be high relative to the specific context of setting a cap for the variable usage charge. On this basis, we propose that a confidence interval of 15% on variable usage costs is appropriate.

Adjusting the variable usage charge for long run efficiency

3.44 In PR08 we set Network Rail's VUC to recover variable usage costs based on the long run efficient steady state cost. An efficient steady state cost is one that excludes current inefficiency due to catch-up efficiency or backlog expenditure. Charges set at the efficient level avoid pricing traffic off the network that can afford to pay the efficient cost for access. In addition to this, it minimises distortions in inter-modal choices.

3.45 At PR08, we applied an efficiency adjustment of 34% to the variable usage charge, which reflected our assumption of the total level of maintenance and renewals efficiency improvement in CP4 and the further catch-up efficiency we had estimated for CP5. These long-term efficiency assumptions were applied to all VUCs, including freight.

3.46 We propose that for PR13 a similar approach is used, so that the variable usage charge is based on costs adjusted to reflect the long run efficient steady state costs. We will determine what these are as part of PR13.

3.47 We can adjust Network Rail's estimates of the variable usage charge to take account of long run efficiency as follows:

(a) First, we consider the actual CP4 charge, as the basis for comparison. The average CP4 charge quoted by Network Rail is at the determined (end CP4) efficiency level. It should be reduced by 16.5% to give the actual CP4 average charge[42].

(b) Then we consider the CP5 charge. We have yet to determine how the CP5 charge should be adjusted to reflect long run efficiency. The range of estimates we give in our advice to ministers documents suggests, however, that the charge would be adjusted by more than 16.5%[43].

3.48 Given that there is a wide confidence interval associated with this efficiency adjustment, and that the efficiency is unlikely to be finalised prior to the PR13 final determination, we propose to levy a cap on the variable usage charge based onend-CP4 efficiencies, i.e. it excludes this adjustment for the CP5 improvements in efficiency.

Evidence from other railways

3.49 Prior to PR08, the estimates of Network Rail's variable costs and hence the VUC were based on top-down analysis of costs. This is still the case for assets other than track, which accounts for the majority of variable costs. In general, top-down estimates of costs (or cost variability) will have wider ranges associated with them compared to more detailed, bottom-up estimates based on disaggregated data. Therefore, wherever practicable, we have required Network Rail to develop bottom-up approaches to cost estimates, which they first introduced during PR08 through the Infrastructure Cost Model (ICM). At that time, Network Rail was aware of discrepancies between previous top-down estimates of cost variability and its updated, bottom-up estimates.

3.50 The Institute for Transport Studies at the University of Leeds (ITS), as part of a consortium, conducted research for European Commission (EC) comparing estimates of cost variability across European railways[44]. We commissioned ITS to revisit and apply their existing work for the EC in this area, and compare it with Network Rail's analysis of variable costs for PR13. As with similar work in PR08, ITS found that the estimates of variable costs as a proportion of total costs for the railway in GB are materially lower than for other European railways.

3.51 For example, ITS analysis for the EU CATRIN study recommended an average proportion of variability with usage across all maintenance and renewal expenditure of 35%, which compares to Network Rail's current estimates suggesting a proportion of around 10%, after adjusting for intensity of usage and certain other factors. The differences between European benchmarks and Network Rail appear to be even greater when considering the proportion of maintenance costs that vary with usage.

3.52 We continue to consider that Network Rail's bottom-up assessment of track costs, through VTISM, is a step change improvement in the estimation of variable costs. We are concerned, however, that we do not yet adequately understand the reason for the major discrepancy between its estimate of variable costs as a proportion of total costs when compared with estimates for other EU railways. We will therefore

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[42] See Table 8.4, presenting the cumulative efficiency assumptions (21% for maintenance and renewals), and paragraph 19.18, detailing the long run efficiency assumptions (34%), in the PR08 Final Determination, ORR, October 2008. This can be accessed at http://www.rail-reg.gov.uk/upload/pdf/383.pdf. The 16.5% adjustment is {1-(1-34%)/(1-21%).

[43] We set out the range of possible efficiencies, separately for maintenance and renewals, in tables 5.8 to 5.11 in both of our advice to ministers publications. For example, we assess the range of efficiency gains by the end of CP5 for renewals expenditure in Scotland to be 16 to 33%.

[44] Project CATRIN, www.catrin-eu.org

investigate this further. We expect to publish ITS's paper in due course and would welcome comments on it.

Implications of Network Rail's variable cost analysis and Arup's review

3.53 Network Rail has prepared estimates of average variable usage costs for passenger and freight services. The average of the charges we ultimately determine in PR13 may differ from these for the following reasons:

(a) Network Rail and we will refine the variable cost estimates further;

(b) the efficiency assumptions, used to adjust the variable costs in order to levy the variable usage charge, are being reviewed; and

(c) geographic disaggregation of charges will change the basis of the charge.

3.54 We discuss each reason in turn.

3.55 On the basis of the work of Arup and our review of the consultation and its responses, we are content with the analysis that Network Rail has carried out on variable costs at this stage. We consider that this analysis provide a reasonable basis for estimating variable costs and translating these into variable charges for the purpose of proposing a freight cap.

3.56 Hence we are content that Network Rail's assessment of a freight and passenger combined cost rate of £1.56 per kgtkm, at 2011-12 prices and end CP4 efficiency, is a best estimate at this stage. It will be refined further as part of PR13 as follows:

(a) Network Rail is continuing to refine its estimates of all its costs, in particular in preparation for its Strategic Business Plan in January 2013, and we will continue to review and challenge its costs.

(b) We are asking Network Rail to use reasonable endeavours to improve its estimates of cost variability further with respect to civil structures and earthworks (over and above the refinements made in its March 2012 conclusions), which were the red flag issues identified by Arup, in order to feed into the conclusions of this analysis. We recognise that Network Rail has already refined its work, as set out in its conclusions letter.

(c) In the medium-term - beyond this work on capping charges - it is important that Network Rail puts in place plans to ensure that it understands the wider impacts of cost variability for all asset categories. As part of this process, Network Rail is starting to refresh its management policies for these assets, working with ORR.

3.57 We are proposing that the VUC is set on the basis of the long run efficient steady state costs, which is the approach we used in PR08. Calculating the average VUC on the basis of long run efficiency rather than end-CP4 efficiency means reducing the average Network Rail estimate, but it is likely that we will not determine the precise adjustment until the PR13 final determination. However our analysis, as set out in Advice to Ministers and discussed earlier in this chapter, suggests a reduction in a charge calculated on the basis of end-CP4 efficiency of more than 15%.

3.58 Network Rail also prepared estimates for passenger services and freight services separately. Based on the relationship between gross and equivalent tonnage in the CP4 VUC model, Network Rail estimated discrete average vehicle cost rates for freight and passenger traffic of £1.46 per kgtkm and £1.60 per

kgtkm respectively. These rates are 7% and 5% higher respectively than the corresponding CP4 average vehicle costs rates (of £1.36 per kgtkm and £1.52 per kgtkm for freight and passenger traffic respectively).

3.59 As discussed in our May 2012 framework document, we intend to implement geographically disaggregated charges, but we do not expect to be able to do this for the start of CP5. Geographic disaggregation of charges introduces an additional uncertainty in the allocation of variable costs between passenger and freight traffic. We are therefore not in a position to propose a cap on freight charges that applies in the context of geographically disaggregated charges. Instead we propose:

(a) a cap on the average freight and passenger variable usage charge. As explained above, in this context we are proposing that a 15% confidence interval is appropriate. An average would then be £1.79 per kgtkm (=£1.56 per kgtkm +15%). This is prior to any adjustment to the charge for efficiency which, on the basis of the evidence and analysis we have to date suggest a reduction in the charge of more than 15%; and

(b) a cap on the average freight variable usage charge that would hold for a nationally-based charge (that is, until a geographically disaggregated charge was introduced for passenger and / or freight services). Our proposed cap is as per Network Rail's conclusions: £1.68 per kgtkm (2011-12 prices) for end CP4 efficiency, which is £1.46 kgtkm plus a 15% confidence band.

Consultation questions

3.60 Network Rail has already consulted on its estimates of variable costs. Do you have any further evidence, subsequent to Network Rail's consultation, that you wish to provide in relation to the process for estimating variable costs and average variable usage charges?

3.61 Do you agree with our analysis, which leads to a proposed confidence interval of 15% around Network Rail's estimates of variable usage costs?

3.62 Do you agree with our approach to estimating an adjustment to variable usage charges for long-run cost efficiency?

4. Framework for a freight specific charge

Key messages from this chapter

- As part of our aim to improve efficiency, we are proposing a new charge for freight operators intended to contribute to recovering those freight avoidable costs not recovered from other freight charges. This charge would serve to increase efficiency by reducing cross-subsidy and making charges more cost reflective.
- Such a charge is permitted, under UK and EU legislation, in specific circumstances.
- In implementing any charge, we need to balance our statutory duties, including having regard to the funds available to the two governments and allowing freight operators to plan their businesses with a reasonable degree of assurance.
- We are considering the policy with respect to individual rail freight market segments, which broadly correspond to different commodities.
- We explain how we propose to use analysis of rail freight traffic, including competition with road freight, to determine which market segments should bear such a charge. We are also considering whether to levy a cap on the charge so that the forecast fall in traffic resulting from the charge does not exceed a specified amount in any one market segment. We suggest that the charge is capped so that this fall does not exceed 10%.
- In this chapter, we set out options for allocating costs to the market segments and the basis on which the charge would be applied.

Introduction

4.1 We are proposing a new track access charge, replacing the freight-only line charge, that would mean that certain freight traffic pays a greater contribution towards Network Rail's fixed costs associated with freight. The aim of this policy is to improve efficiency by reducing cross subsidy and making charges more cost reflective.

4.2 A secondary benefit of this policy is that it increases transparency of Network Rail's costs and exposes them to scrutiny from the wider industry. By exposing freight operators to a wider range of Network Rail's

costs, these operators are incentivised to scrutinise and challenge these costs; and they are incentivised to consider how they can efficiently modify their behaviour to reduce these costs[45].

4.3 We have considered the extent to which freight services should contribute to Network Rail's fixed costs in previous reviews of charges. An significant change in the context for this review relates to our statutory duties to have regards to the funds available to the Secretary of State and other persons who make available the sources and funds for the railway, notably Scottish Ministers. Funds available to both governments for the railways are now more constrained than in either PR08 or the freight charges review 2001. Having regard to these statutory duties we therefore consider that it is appropriate ask whether a different approach to the structure of costs – in particular the recovery of more fixed cost from certain freight customers - would result in more efficient use of the subsidy put into the industry.

4.4 In this Chapter, we set out our proposal on how the charge would be calculated and levied. The rest of this chapter is structured as follows:

(a) we explain the legal framework;

(b) we set out the historical development of the structure of track access charges for freight traffic;

(c) we identify the costs that we propose to recover through this charge; we discuss these costs further in chapter 5.

(d) we set out how we propose to define market segments;

(e) we explain our approach to determining which market segments should bear the charge;

(f) we explain how we are allocating costs between market segments;

(g) we suggest that it may be appropriate to cap charges on the basis of their impact on rail freight traffic, and how we might do that; and

(h) we consult on the units of the proposed charge.

Legal framework

4.5 Track access charges are required to comply with the Railways Infrastructure (Access and Management) Regulations 2005 ("the Access and Management Regulations"). The relevant legislation is a transposition of EU Directive 2001/14.

4.6 Under the regulations, charges should be set to reflect the costs directly incurred, though some exceptions to these charging principles are permitted. The exception relevant here is a mark-up on charges (as specified in schedule 3). The rationale for such a mark-up would be "to obtain full recovery of the costs incurred by the infrastructure manager". The regulations set out that the mark-ups may be levied "on the basis of efficient, transparent and non-discriminatory principles, whilst guaranteeing optimum competitiveness, in particular in respect of international rail freight". It goes on to explain that the effect of the 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".

[45] Related to this, we are consulting on "Aligning incentives to improve efficiency", May 2012. This can be accessed at: http://www.rail-reg.gov.uk/upload/pdf/aligning-incentives-to-improve-efficiency-0512.pdf

4.7 We also have a number of statutory duties, set out in section 4 of the Railways Act 1993 and other legislation. We consider particularly relevant duties in this context to be:

(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 which it considers economically practicable;

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

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

(d) To promote competition in the provision of railway services for the benefit of users of railway services;

(e) To have regard to the funds available to the Secretary of State for the purposes of his functions in relation to railways or railway services;

(f) Our duty which, in summary, requires that we have regard to the expenditure that is to be incurred by Scottish Ministers;

(g) To provide efficiency and economy on the part of persons providing railway services; and

(h) Otherwise to protect the interests of users of railway services.

4.8 In PR08 we developed a test, having regard to our section 4 duties, to assess what the market can bear.[46] The test had four parts which, in outline, were as follows:

(a) the impact on the freight market;

(b) the impact on future growth of the freight market;

(c) the impact on operator profitability, in particular whether an efficient operator withdraws or does not enter the market as a result of this charge; and

(d) other impacts, including the impact of transfer of traffic from rail to road.

4.9 In PR13, rather than use this test, we instead are explaining more explicitly how our policy proposals are consistent with the legislation and are an appropriate balancing of our statutory duties. We explain this in the relevant sections.

4.10 We propose to satisfy the requirements of the Access and Management Regulations 2005 as follows:

(a) *Transparency*: we will determine the charges for CP5 as part of PR13, and Network Rail will publish the price lists; as with other track access charges, the charges is being developed through consultation and industry engagement.

(b) *Non-discriminatory*: the charge will be differentiated by market segment but not by freight operator.

(c) *Full recovery of costs*: we are proposing a charge that recovers particular costs, with a cap to the revenue to prevent over recovery. We discuss these costs later in this chapter and in chapter 5.

(d) *Efficient principles*: we undertake extensive analysis of rail freight demand and the extent to which it transfers to road (chapter 6) as the basis for identifying market segments to bear the charge.

[46] See, for example, paragraph 4.30 of our *consultation on caps for freight track access charges*, December 2006.

(e) *"Optimal competitiveness"*: (as above) we consider the extent to which the rail freight market segment competes with road freight is an important consideration in identifying which market segments should bear the charge.

(f) *"Market can bear"*: 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.

Historical development of the structure of freight access charges

Freight Charges Review 2001

4.11 Prior to 2001, rail freight track access charges were determined by negotiation. The freight charges review 2001 (FCR2001) represented a major change in that charges were determined and published on transparent price lists[47].

4.12 Another major change in the review was that we determined that freight operators would pay only variable charges for usage and would not contribute to fixed or common (shared) costs. The then regulator argued that in principle freight operators should fund those fixed costs that could be avoided if freight operations were to cease completely. The associated charges were not levied, however, in part due to concern that there was conflicting evidence on the ability to pay of different market segments (and freight charges were considerably higher than they are today)[48].

4.13 The FCR2001 conclusions explained that we accepted the UK Government's[49] argument that the long-run efficiency assumptions we applied at that time to setting freight charges should not fully apply to certain market segments (see below for a definition): ESI coal & iron ore. The reason for this decision was that in those markets rail already enjoyed a high market share with a clear competitive advantage over road", and therefore that these markets were relatively inelastic to changes in rail access charges[50]:

4.14 The resulting combined variable charges (including the variable usage charge, the capacity charge and the electric current for traction charge) fell from an average charge of £3.70 per kgtm in 2001 (in 2000/01 prices) to £3.36 per kgtm from 2002 for ESI coal and iron ore and £2.85 per kgtm for other commodities. These average charges were equivalent to a 16% mark-up on total variable charges for ESI coal & iron ore over 10 years, relative to other freight charges.

4.15 We discuss the concept of freight avoidable costs in more detail in Chapter 5.

PR08

4.16 When freight charges were next reviewed, in PR08, we took account of *The Future of Rail* White Paper (2004)[51], in which DfT stated that it expected freight operators to pay the full costs of freight-only

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[47] Review of freight charging policy: final conclusions, Office of the Rail Regulator, October 2001. This can be accessed at http://www.rail-reg.gov.uk/upload/pdf/136-fchargfincon.pdf

[48] Chapter 3, Review of freight charging policy provisional conclusions, Office of the Rail Regulator, April 2001. This can be accessed at http://www.rail-reg.gov.uk/upload/pdf/125-frgt_chrg5_4.pdf

[49] The agency responsible at the time was the Strategic Rail Authority, or the SRA

[50] See paragraphs 3.11 – 3.14 of the Review of freight charging policy: final conclusions, ORR, October 2001. This can be accessed at http://www.rail-reg.gov.uk/upload/pdf/136-fchargfincon.pdf

[51] Cm 6233.

lines. Prompted by this guidance, we introduced the freight-only line charge, to recover these costs, but did not seek to recover other freight-specific fixed costs.

4.17 The conclusions of PR08 updated the structure and level of freight charges, taking account of increases in costs since 2001 and the financial position of the Secretary of State for Transport and Scottish Ministers as funders.

4.18 In PR08, given the uncertainty with Network Rail's costs and the levels of freight charges, and that the government wanted freight operators to pay the full costs of freight-only lines (as set out in its 2004 white paper), we decided to set out at an early stage in PR08 maximum levels (caps) for the key freight charges in CP4. We did this in February 2007[52] (and this consultation forms part of an analogous process for PR13).

4.19 This approach, coupled with the subsequent 34% reduction in freight variable charges (to reflect efficiency), was roundly welcomed by government and the freight industry. It provided greater certainty for train operators earlier in the periodic review process, recognising the competitive environment they operate in and our section 4 duty to allow them to "plan the future of their businesses with a reasonable degree of assurance".

Costs to be funded through the charge

4.20 Freight operators' track access charges are generally set to reflect costs directly incurred[53]. The charges are calculated by estimating the change in Network Rail's costs – under particular efficiency assumptions - associated with a small change in freight traffic. Network Rail's costs associated with all freight traffic are not fully covered by these charges. In order to improve efficiency by reducing cross subsidy and making charges more cost reflective, we are proposing that certain freight traffic pays a new charge to contribute to these costs.

4.21 This charge is permitted, in certain circumstances, under the Access and Management Regulations "to obtain full recovery of the costs incurred by the infrastructure manager". We interpret this to meant that the charge should not result in over-recovery of the costs.

4.22 All freight-related infrastructure costs can be allocated to either one of these two categories:

(a) costs common to passenger and freight services, i.e. freight-related costs which would be required for passenger services even if all freight services were to cease; and

(b) freight avoidable costs, that is the costs that Network Rail would not incur, over the long term, if all freight services were to cease (but passenger services were to continue).

4.23 The key distinction between freight avoidable costs and variable costs (cost directly incurred) is that the latter relates to changes in cost for only a small change in traffic. This is set out in Box 5.1 in chapter 5.

4.24 Recognising the contribution that rail freight makes to the economy and the environment, there may be a strong case for freight-related infrastructure costs being subsidised. But, both for reasons of

[52] We published this as part of our advice to ministers document; http://www.rail-reg.gov.uk/server/show/nav.1917

[53] The exception to this is the freight-only line charge, which is a network-wide charge levied to contribute to recovery of costs of freight-only lines.

transparency and for increasing efficiency by reducing cross subsidy, it is important to consider which infrastructure costs, and therefore which subsidy, should be allocated to rail freight services.

4.25 Consistent with our approach in previous reviews of freight charges, we propose that the costs that Network Rail should seek to recover from its customers (i.e. freight operators) through a freight specific charge should be limited to freight avoidable costs. We are not proposing to seek to recover from those customers costs common to passenger and freight services.

4.26 We are considering that the new charge be set with the aim of recovering freight avoidable costs (and not costs that are common to freight and passenger traffic). We discuss freight avoidable costs, and the process for estimating them, in chapter 5.

Definitions of freight market segments

4.27 We are proposing a charge that is applied differentially between freight market segments. This would enable us to levy a charge that is efficient – because we can apply the charge in a way that takes account of differences in market segments. For example, some rail freight traffic competes directly with road haulage, whereas other rail traffic does not in any material way. Analysing market segments separately is also the means by which we can confirm that we are satisfying the legal requirement that the "market can bear" the charge, through demand analysis: our demand analysis is described in Chapter 6.

4.28 We considered market segment definitions in some detail in our freight cap consultation in PR08[54]. We defined the commodity-based market segments using the following principles:

- the definition of market segments should be practical, comprehensive and objective;
- market segments should, as far as possible, have common characteristics of some kind that place them, as a class, in a different commercial position against another identifiable class; and
- choice of market segments should not distort incentives.

4.29 Given these principles, we explained that the decision to use rail freight and the ability to bear a mark-up is largely based on product characteristics: therefore, we concluded that market segments for freight should be based on the products transported by rail. We did not propose, for example, to distinguish between the operators that transport the commodities, as that is potentially discriminatory.

4.30 The list of market segments we used in PR08 is shown in figure 4. 1. We propose to retain these market segments for PR13.

[54] See (see the December 2006 "Consultation on Caps for Freight Track Access Charges" http://www.rail-reg.gov.uk/upload/pdf/310.pdf

Figure 4.1: Freight Market Segments

ESI Coal	Construction	Waste	Channel tunnel
Industrial Coal	Petroleum and chemicals	Spent nuclear fuel	
Iron Ore	Intermodal	General Distribution	
Metals	Automotive	Mail and Premium Logistics	

Freight markets to which the charges should apply

4.31 In proposing the market segments to which the charges should apply, we follow the requirements of the Access and Management Regulations. In paragraph 4.10 we outlined how the requirements of Regulations would be met. In considering whether the market can bear the charge, we are considering whether there is a significant risk that the charge could result in the exclusion of the use of the infrastructure by the market segement. In considering efficiency, we propose to take the following factors into account:

(a) the elasticity of demand, i.e. how demand for rail freight might fall or rise as a result of higher charges; and

(b) 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).

4.32 In addition, a number of statutory duties may be relevant in this area, and we discuss this in chapter 6.

4.33 In considering which markets should have the charge applied to them we have researched their elasticity and their propensity to switch to road. Details of this work are set out in chapter 6. We are not considering levying the charge on any market segments other than those that are both highly inelastic and face little competition from road. We consider that this approach would be proportionate and would also be consistent with our approach in PR08 with respect to freight-only lines and with our statutory duties including our duty to contribute to the achievement of sustainable development.

4.34 We are proposing to only apply a charge to markets that are the most inelastic and face little competition from road. This judgement is consistent with our approach in PR08 with respect to freight-only lines and also with our statutory duties, including our duty to contribute to the achievement of sustainable development.

Allocating costs between freight market segments

4.35 We need to consider the following when determining a method for allocating infrastructure costs between freight markets for the purpose of the new charge:

(a) the degree of disaggregation of costs for which the allocation is applied (for the CP4 freight-only line charge, costs are disaggregated to individual lines); and

(b) the approach to which costs shared by more than one commodity are allocated between commodities (for the CP4 freight-only line charge this allocation is on the basis of gtkm).

4.36 It may not be practical to allocate all freight avoidable costs (or, more generally, the costs being recovered) on the network at the level of individual lines, because the scale of the task is much greater than that for freight-only line costs. It would still be possible to allocate costs on a fairly detailed basis, however. For example track maintenance and renewals costs could be allocated at the level of the strategic route section[55].

4.37 Allocation at a relatively detailed level, by being more cost-reflective, could support the industry's efforts to reduce its costs through alignment of incentives. It increases transparency of cost, thereby facilitating challenge of Network Rail's cost and the costs that freight operators impose on Network Rail. Our past experience has been that this is helpful to Network Rail in managing its own costs and to us in our regulation of Network Rail. It also gives freight operators incentives to manage the long term costs they impose on the infrastructure.

4.38 Costs common to more than one freight market segment, under the CP4 freight-only line methodology, are allocated to those market segments on the basis of gross tonne km. Under this methodology, the costs associated with freight markets judged not to be able to bear a mark-up, such as intermodal traffic, are not recovered by the charge. This means that in CP4, less than half of freight-only line costs are recovered by the associated charge. In principle, we do not need to adopt this approach in the case of a new charge: if certain costs are common to a market segment to which the charge is levied and another market segment to which the charge is not levied, they could be allocated in full to the former, for example (just as a business may allocate common costs in full to their more profitable activities). We see the two key options as follows:

- the CP4 method: allocate costs that are common to more than one freight market segment to each segment on the basis of gross tonne km (or other suitable metric); the costs allocated to market segments that are deemed not to be able to bear the charge are then not recovered from freight operators through mark-ups;

- alternative method: allocate costs that are common to more than one freight market segment in full to those segments deemed to bear the charge, so that the common costs are borne by those market segments in full.

4.39 As we do not yet have a good understanding of the scale of the potential costs, we cannot assess the impact of these two options at this stage but will be able to do so when the costs are better understood..

A cap on the impact of the charge on freight traffic

4.40 There is a balance to be struck in levying such a charge. This balance requires us to have regard to our statutory duties, of which relevant ones include having regard to the funds available to the Secretary of State for Transport and Scottish Ministers and to promote the use of the railway in GB for the carriage of (passengers and) goods.

[55] Currently, fixed costs recovered through franchise passenger operators' fixed charge, are allocated between operators at the level of the strategic route section (for which there are some 300 sections defined).

4.41 In PR08 we developed policy on the basis that the charge should result in little or no change to levels of freight traffic. We are revising this constraint for PR13, in part reflecting changes to the funds available to the two governments. We are considering whether to continue to have some form of direct constraint on the impact on freight traffic (other than the constraints already imposed, for example relating to efficient charges and not excluding market segments). Hence we are considering:

(a) calculating the charge using the criteria discussed in this chapter, but then

(b) where applicable, capping the charge so that the average fall in freight traffic that we forecast for each market segment to which the charge is applied is no more than a certain defined percentage.

4.42 We consider that a suitable cap may be such that the charge results in no more than a 10% fall in the freight moved (tonne km) for each market segment. Our analysis of historic traffic data shows that this is within the normal range of fluctuations of traffic lifted experienced for key individual market segments due to external factors over a five year control period.

4.43 Table 4.2 sets out our suggestion of how the cap might work, taking account of competition with road freight.

Table 4.2: Possible proposed adjustment to the charge

ORR forecast impact of track access charge on freight traffic (kgtm) for CP5 for each market segment	How we might adjust the charge
<5%	No adjustment - apply proposed charge
5% to 10%	Consider reducing the charge (but so that freight traffic still falls by at least 5% as a result of the charge), to take account of effects on road traffic and associated externalities, because these are disbenefits of larger reductions in rail freight traffic.
>10%	Reduce the charge so that freight traffic is forecast to fall by on average no more than 10% as a result of the charge, taking account of effects on road traffic and associated externalities, and uncertainty of forecast.

Charge unit

4.44 We would levy the charge on individual journeys, rather than a fixed charge determined in advance irrespective of traffic volumes. The latter approach would be unsuitable for a number of reasons, for example, depending on how it is structured, it could act as a barrier to small operators or efficient new operators entering the market.

4.45 For that reason, we propose that the revenue generated from the charge would be subject to a cap (in addition to the freight traffic cap referred to above), reflecting the costs being recovered. For example, if the charge was set to recover certain freight avoidable costs, there would be a cap on the revenue Network Rail could receive from the charge to ensure that it did not over-recover these costs. This approach is consistent with the CP4 freight-only line charge, for which we determined a cap on revenue to Network Rail.

4.46 We know that some traffic, notably that of ESI coal, is forecast to fall over some years in CP5. That would imply that a charge could potentially rise significantly as fixed costs are shared over less traffic. This is the implication of our proposed approach to recovering freight avoidable costs. As described above, however, we are also considering placing a cap on the charges for individual years so that the forecast reduction in freight traffic is limited, for example, to be less than 10%.

4.47 The freight-only line charge is levied per kgtm (thousand gross tonne miles). The same units apply to the variable usage charge for freight services, whereas the capacity charge is levied per train mile. The unit we apply is important because it may significantly affect the scale of the impact[56]. We are considering the following options:

- a charge per kgtm;
- a charge per tonnes lifted;
- a combination of the above: a charge per kgtm, but will a maximum charge for any one journey so that in practice charges do not increase above a certain distance – 50 miles say.

4.48 A charge that varied in proportion to mileage would be more cost reflective: journeys with a long length of haul would typically have more associated avoidable costs than shorter journeys. A charge per tonne, however, would reduce the impact of the charge on freight traffic, which may have some benefits, for example in supporting rail freight competition. This is a detail of charge implementation, and we are not proposing a preferred option at this stage. We do, however, seek your views on this.

Consultation questions

4.49 Do you agree with our proposed approach to satisfying the Access and Management Regulations with respect to levying a new freight-specific charge?

4.50 Do you agree that the infrastructure costs allocated to freight operators - either for direct funding by freight operators, or explicitly subsidised by government - should be freight avoidable costs, including fixed costs, but not costs common between passengers and freight?

4.51 Do you agree that we should retain our current definitions of particular categories of rail freight commodities as separate market segments?

[56] This is illustrated in chapter 6 where the percentage impact of a charge on demand for ESI coal is much smaller than the percentage impact on demand for rail freight; a charge per tonne would have a similar effect to the former, whereas a charge per tonne km would have the larger effect.

4.52 Do you believe that we have taken into account the appropriate factors in considering the efficiency of the proposed charges? Do you believe there are other factors we should take into account?

4.53 Do you agree that our approach (of analysing rail freight traffic) addresses the relevant criteria, when considering which to which market segments the charge should apply?

4.54 Do you agree that certain market segments should be exempt from the new charge?

4.55 What do you think is the most appropriate methodology for allocating costs, and what is your reasoning?

4.56 Do you consider it is appropriate to cap the new charge for particular market segments according to its impact on the associated freight traffic (in addition to a constraint relating to relevant avoidable costs)? Do you wish to propose an alternative?

4.57 What should be the unit of the new charge? Please explain your reasoning.

5. Freight avoidable costs

Key messages from this chapter

- We are considering replacing the current freight-only line charge with a charge for freight avoidable costs, that is infrastructure costs that would be foregone if freight services were no longer to use the network. However, we are not proposing that the charge, , seeks to recover costs common to passenger and freight services.

- Currently we only have preliminary indicative estimates of the scale of freight avoidable costs not funded by other freight track access charges (around £200m to £250m a year at current levels of efficiency but the confidence interval is wider than this). Network Rail is commissioning work, that will report in the Autumn, to estimate freight avoidable costs.

- We propose that the conclusions to this freight cap consultation be based on the work Network Rail is conducting, though the cost estimates will continue to be refined beyond this, as part of PR13.

Introduction

5.1 We explain in Chapter 4 that:

(a) The variable usage charge does not cover all of Network Rail's infrastructure costs associated with freight traffic;

(b) In order to improve efficiency in the railway by removing cross subsidy and making charges more cross reflective, we are proposing that certain freight traffic pays a new charge to contribute to these costs.

(c) we are considering replacing the current freight-only line charge with a charge for freight avoidable costs.

5.2 It is therefore important that we understand the composition and level of freight avoidable costs, which include the costs of freight-only lines. We are not in a position to be definitive about our proposals until we have a better understanding of these costs, and hence the charge's potential impacts.

5.3 In the rest of this chapter we explain the basis on which we are proposing that these costs are covered, the definition of freight avoidable costs, and the work Network Rail is doing to update its estimates of freight avoidable costs.

Allocating infrastructure costs to freight services

5.4 Recognising the contribution that rail freight makes to the economy and the environment, there may be a strong case for freight-related infrastructure costs being subsidised. But, to increase transparency and

increase efficiency by challenging cross-subsidy, it is important to consider which infrastructure costs should be allocated to freight.

5.5 All freight-related infrastructure costs can be classified as one of the following:

(a) **costs common to passenger and freight services**, i.e. freight-related costs which would be required for passenger services even if all freight services were to cease; and

(b) **freight avoidable costs**, that is the costs that Network Rail would not incur, over the long term, if all freight services were to cease (but passenger services were to continue).

5.6 The key distinction between freight avoidable costs and variable costs (cost directly incurred, that form the basis of the variable usage charge) is that the latter relates to changes in cost for only a small change in traffic. This is set out in Box 5.1.

Box 5.1: What is the relationship between avoidable costs and variable costs?

The key distinction between freight avoidable costs and variable costs (cost directly incurred, that form the basis of the variable usage charge and certain other charges) is that the latter relates to changes cost for only a small change in traffic. This was set out in PR08 as follows[57]:

1. variable costs: At a disaggregate level, the incremental (i.e. avoidable) cost of one additional, or one less, freight train service (assuming that there is spare capacity) is simply the additional, or the avoided, operating, maintenance and renewal costs incurred. This cost is termed the variable cost of operating on the network.

2. avoidable costs: At the aggregate level, the incremental (or avoidable) cost for rail freight as a whole is the total costs that could, in theory, be saved if freight ceased to operate on the network. This element encompasses not only the variable costs but also the fixed cost (costs that do not vary with the volume of traffic) of freight-only lines and providing for freight capacity and capability on the mixed use network, for example from bridge strengthening or providing passing loops. This is termed the avoidable cost of operating on the network.

The two concepts overlap but are quite different. If variable costs per unit were very high, conceptually at least, their associated revenue could exceed avoidable costs. To avoid double counting cost recovery, a charge set to recover freight avoidable costs should be levied net of those charges set to reflect costs directly incurred, i.e. net of forecast revenue from the variable usage charge, the capacity charge and potentially other charges. Freight-only line costs are a subset of freight avoidable costs, and a charge for freight avoidable costs would replace a freight-only line charge.

5.7 Consistent with our approach in previous reviews of freight charges, we propose that the costs associated with freight should be considered to be limited to be freight avoidable costs. They should not include those costs common to passenger and freight services. This is the right approach if freight is considered to be the marginal user relative to passenger traffic, for example with respect to capacity

[57] See paragraph 2.3 , Consultation on Caps for Freight Track Access Charges, December 2006, http://www.rail-reg.gov.uk/server/show/nav.1917

allocation. If freight is not the marginal user, some of the common infrastructure costs can also reasonably be allocated to freight services.

5.8 We are proposing that the new charge be set with the aim of recovering some of the freight avoidable costs (and not costs that are common to freight and passenger traffic). But that, in setting the charge, we balance the objective of increasing the value for money of the taxpayer against the negative effects of the charge, including distortions to rail freight markets and their future growth, and the consequential impacts on the economy and the environment. In practice this means that these costs will not be recovered for some freight market segments, and may not be fully recovered for others.

PR08 analysis of freight avoidable costs

5.9 During PR08 we asked Network Rail to calculate freight avoidable costs for the purpose of explicitly showing the level of subsidy of infrastructure associated with freight. We had previously asked AEAT to undertake a detailed analysis of avoidable costs of each of the franchise passenger rail operators[58] as the potential basis for allocating the fixed charge. Network Rail used the approach adopted by AEAT to carry out its own analysis to estimate freight avoidable cost. This approach involved:

(a) an assessment by individual route segment of the number of plain line track kms that could be avoided if each operator was removed;

(b) models for assessing the avoidability of signalling equivalent units as a function of track km removed;

(c) the calculation of avoidable 'equated' track kms, which take account of the wider impact on costs of changes in total tonnage, maximum axle load and/or line speed, and hence on the cost of providing the capability; and

(d) applying the most relevant avoidability metric to long-run projections of expenditure in each asset/cost category.

5.10 Network Rail then adjusted AEAT's approach to account for the different cost base used by AEAT and revised some of the allocation metrics. In total Network Rail estimated the pre-efficient freight avoidable costs at between £275 million and £325 million per year, including freight-only line costs and variable costs.

Estimating the size of a charge

5.11 Prior to conducting detailed work on freight avoidable costs for PR13, we sought to estimate the potential revenue associated with a charge set to recover freight avoidable costs. These were based on the estimates that Network Rail prepared for PR08, with other charging revenue netted off. Our calculations are set out in Table 5.1.

Table 5.1: Preliminary estimate of possible scale of freight avoidable costs not funded by existing track access charges (annual £m, in 2005-06 prices unless stated)

[58] Recovery of fixed costs, AEA Technology, London, October 2005. This can be accessed at http://www.rail-reg.gov.uk/upload/pdf/aea_recov_fixed_rep-oct05.pdf.

Element of costs	Low range (floor)	High range (ceiling)
Network Rail estimates (pre-efficiency, adjusted for cost base)	£275m	£325m
Adjustment for CP4 determined efficiency	£230m	£270m
LESS		
Revenue from freight-only line charge	-£5.25m	-£5.25m
Freight variable charges	-£74m	-£74m
Capacity charge	-£4.3m	-4.3m
Net freight avoidable costs (2005-06 prices)	**£156m**	**£196m**
Net freight avoidable costs (2011-12 prices)	**£192m**	**£241m**

Source: Paragraph 3.70 of December 2006 freight cap consultation, and Tables 19.11, 19.13 and 19.15 of PR08 final determination.

5.12 Our indicative calculations suggest that the freight avoidable costs that are not currently recovered by charges is in the range £192m to £241m a year (at end CP4 efficiency)[59].

5.13 As set out in chapter 2, coal traffic accounts for around 30% of rail freight moved currently. Using a simple allocation metric, this could imply levying a charge on coal to raise 30% of the costs not currently recovered, i.e. around £60m to £75m a year, though there would be an adjustment for the expected gain in efficiency for CP5 (as set out in chapter 3).

5.14 We used this analysis to inform the options we asked consultants NERA and MDST to test in their analysis of the market segments, as set out in chapter 6. In particular, we have worked on the basis that as ESI coal traffic accounts for around 30% of the gross tonne km on the network, it might be apportioned a similar percentage of freight avoidable costs. This amounts to around £60m to £75m, as a central estimate, prior to an efficiency adjustment. The effiency adjustment would reflect the determined CP5 average (in contrast to the adjustment for the variable usage charge which would be adjusted for the long run efficiency level).

[59]Given the wide confidence intervals associated with these estimates, we have not adjusted single year differences in prices, for example.

Estimating freight avoidable costs for PR13

5.15 As part of PR13 we have asked Network Rail to update its estimates of freight avoidable cost over the course of summer 2012. Network Rail proposes to estimate freight's avoidable cost based on an estimate of the long-run (over 35 years) annual average avoidable costs of removing freight traffic from the existing network.

5.16 The charges will be calculated on the basis of the following costs:

(a) Gross freight avoidable costs

(b) Net of forecast revenue from the variable usage charge

(c) Net of forecast revenue from the capacity charge (and any new charge to incentivise capacity utilisation).

5.17 Costs for freight-only lines and revenue from the variable usage charge will be deducted from total gross freight avoidable costs to produce a net figure. We will therefore populate a table in the same format as Table 5.1 above to produce the estimate of net freight avoidable costs.

5.18 Network Rail has proposed that its analysis will identify the avoidable costs that fall into the following categories:

(a) Any assets that would no longer be required e.g. surplus sections of track; and

(b) Any assets that would be maintained and / or renewed at a lower capability e.g. bridge decks. Relevant considerations in this respect include:

(i) The network would still have to accommodate Network Rail engineering traffic; and

(ii) The technical standards for interoperability (e.g. using the load bearing standards for passenger-only lines) and the extent to which renewals would migrate towards these standards over time – particularly on main lines.

5.19 Set out below is an indicative list of examples of avoidable cost drivers for the different asset classes, that will guide the work to update avoidable cost estimates:

(a) **Track**: loops, chords, reducing a 4 track railway to 2 tracks and renewing track at a lower capability.

(b) **Structures**: Renewing structures at lower capability reflecting the absence of heavier freight traffic.

(c) **Signalling**: Signalling and S&C at junctions between loops and chords and the mixed traffic network.

(d) **Staff**: The 'HQ' freight team, Customer Relationship Executives and Senior Route Freight Managers.

(e) **Other**: electrification, telecoms and building costs etc should also be considered. However, one would expect the avoidable costs associated with these categories to be lower than those set out above.

5.20 Network Rail expects to appoint advisors to carry out this analysis of freight avoidable costs by the end of May 2012. Network Rail will then brief the industry on the emerging findings of this study through the VTAC forum, as the work progresses.

Freight-only line costs

5.21 As explained above, estimation of costs for freight-only lines is a key element of calculating freight avoidable costs. Network Rail carried out a review of the cost of freight-only lines as part of its consultation on VUC, freight caps and freight-only line charges described in Chapter 3. It retained the freight-only line definition established in PR08, adjusted for the fact that some lines carry multiple commodities using each commodity's share of gross tonnage.

5.22 Following consultation responses, which led Network Rail to adjust its initial estimates, Network Rail updated its freight-only line cost estimates to £4.94m and £1.27m per year for ESI coal and spent nuclear fuel respectively. These cost estimates are shown in Table 5.2, comparing the figures to the equivalent cost determined for PR08.

Table 5.2: Freight-only line costs (per year, 2011-12 prices end CP4 efficiency)

£m / year	March 2012 conclusions	PR08	change	% change
Coal ESI	4.94	5.25	-0.31	-6%
Spent Nuclear Fuel	1.27	0.84	0.43	51%

5.23 Network Rail argued that, as its cost estimates were more robust, a narrower confidence interval of +/- 15% would be appropriate (rather than +/- 20%). Uplifting the ESI coal and spent nuclear fuel cost estimates by 15% results in respective estimates of £5.68m and £1.46m.

5.24 However, consultees have expressed concern that Network Rail does not have sufficiently accurate data on which to model freight-only line costs, and that the confidence interval should also reflect this uncertainty. Arup, in its review of Network Rail's calculation and method, did not find any computational errors. However, given the range of approximations involved in the calculations, they specifically recommended a 20% confidence interval around the cost estimates. It also recommended a minor change to the calculation of signalling costs, which Network Rail will incorporate into its calculations. Applying this uplift of 20% to NR's cost estimates produces an upper-limit cost estimate for freight-only line costs of £7.45m, and a lower limit of £4.97m.

Consultation questions

Do you agree with our framework for estimating freight avoidable costs? Please explain any suggested changes to the framework, including your calculations (noting that there will be further opportunities to contribute to this work as the cost estimates are refined during the periodic review, for example in relation to Network Rail's strategic business plan).

6. Market analysis

Key messages from this chapter

- In order to establish the charge to recover freight avoidable costs, consistent with the EU legislation, we have reviewed the ability of the different freight market segments to bear higher charges.

- We have commissioned consultants to analyse the impact of charge increases on freight traffic and competition with road freight. We have used the analysis to investigate the potential to apply a charge to ESI coal, spent nuclear fuel, iron ore and other coal (including biomass), on the basis that the analysis showed these are the markets for which there is little competition with road and traffic levels are highly inelastic. We have tested how these market segments might respond to charges consistent with our preliminary estimates of the allocation of freight avoidable costs.

- This analysis showed that demand for ESI coal is not sensitive to changes in track access charges: a charge representing around a four-fold increase on current charges was forecast to be associated with a reduction of 5% in ESI coal lifted. The fall in demand for rail freight transporting the coal (coal moved), however, may be much more substantial because there is scope for reductions in length of haul. Indicative analysis suggested a potential reduction of 25%, though some continued rationalisation of length of haul may occur in any case as coal traffic continues to fall in response to the introduction of stricter environmental standards.

- Our consultants' assessment was that the level of freight traffic transporting spent nuclear fuel is not affected by the increase in track access charges we have considered. Similarly, freight traffic transporting iron ore is not affected by the increase in track access charges we have tested. We have also considered the potential for steel production to relocate as a result of an increased track access charge for iron ore, but consider this unlikely as we estimate the charge we have tested to represent an increase in steel production costs of around 0.1%. Biomass is a substitute for coal, its demand is dependent in part on the associated subsidy regime, and is a new developing market. Other coal, used for various industrial purposes, faces stronger competition from road in some instances.

- On the basis of our analysis, we are consulting on levying a charge on ESI coal traffic and spent nuclear fuel traffic (the only commodities to which the freight-only line charge currently applies).

- Our analysis suggests a good case for introducing the charge for iron ore also. We are interested in consultees' views regarding our analysis and whether they agree that there is also a case for levying a charge on iron ore.

- We are not proposing to levy such a charge for biomass as part of this periodic review. Instead, we propose to revisit this policy to coincide with the recalculation of its associated credit (subsidy) regimes (from 2017 for England and Wales). We are considering whether we would then

implement any charge for biomass at the point that the new credit levels are introduced or for the subsequent control period (CP6).

- We do not consider that we yet have sufficient information to determine whether it is appropriate to levy a charge on other coal flows, but seek consultees' views on this.

Introduction

6.1 In chapter 4 we said, consistent with EU regulations, in deciding whether or not to levy higher charges on certain markets, we need to ensure the charges are efficient and that the market can bear the charge. This chapter describes our analysis of the impacts of higher charges on rail freight market segments and explains how we propose to use this analysis to identify the market segments to which the charge should apply, and how we propose to use this form of analysis to set a cap.

6.2 Our market analysis therefore assesses the following two principal criteria:

(a) the efficiency of charges, by assessing:

(i) the elasticity of demand, i.e. how the 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); and

(b) whether the market can bear higher charges, by considering whether there is significant risk that the charge might result in the exclusion of the use of the infrastructure by a market segment.

6.3 We commissioned consultants to examine how freight market segments respond to changes in track access charges:

(a) First we commissioned MDST to model the impact of higher track access charges for all rail freight market segments, of up to 100% increase in the variable usage charge. We used its analysis as a means to filter the number of market segments for which we would consider levying a new charge that was a mark-up on costs directly incurred.

(b) Second we commissioned NERA to conduct detailed modelling of the ESI to examine how higher track access charges would affect demand for coal, biomass and nuclear fuel for electricity generation, and hence the impact on rail freight for those commodities.

(c) Third we commissioned MDST to look in greater detail at market segments with highly inelastic demand, and, drawing on the results of the NERA analysis, assess the impact of substantially higher track access charges on that demand.

6.4 These consultancy studies have been conducted with extensive stakeholder engagement. In particular, consultants have presented interim stages of their work to the monthly VTAC development group meetings on four separate occasions[60]. We are publishing these consultancy studies as part of PR13[61].

[60] The objectives of and arrangements for these open meetings are explained in Network Rail's December 2011 letter on engaging with customers on structure of charges, which can be accessed at http://www.networkrail.co.uk/PeriodicReview2013.aspx.

Modelling the impact of changes to charges across all market segments

Scope of work

6.5 In this section we set out the first stage of work undertaken by MDST. We appointed 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 that was a mark-up on costs directly incurred.

6.6 The study tested the impact on demand of an increase in price for each of the market segments (commodities) currently carried by rail, by testing options for changes in track access charges equivalent to a change in the VUC of -10%, +20%, +50% and 100%[62].

Summary of the approach

6.7 MDST used its GB Freight Model (GBFM[63]), together with bespoke models and calculations for specific commodities and markets, to forecast the change in demand for rail freight in each market segment in response to changes in track access charges. The model used traffic data supplied by Network Rail for the year ending September 2011. In particular MDST:

(a) used the GBFM and associated models to prepare a base case model of rail freight tonnage, for each origin/destination, together with tonnes moved by other transport modes. MDST validated the base case by comparing the traffic with net tonne kms figures in National Rail Trends by commodity;

(b) prepared a base case forecast for 2018-19; in this forecast, MDST assumed that track access charges did not change in real terms from those currently applied;

(c) tested each track access charging option to produce estimates of rail freight demand by commodity; and

(d) made a broad assessment of the external impacts of some freight traffic switching from rail to road (or vice versa) as a result of each charging option, by using a single rate for external costs per HGV (= lorry) km, reflecting impacts including changes to road congestion, road traffic accidents, air pollution, and road infrastructure costs[64].

Results

6.8 Table 6.1 summarises MDST's forecast change in demand for rail freight by each commodity resulting from an increase in track access charges equivalent to doubling the VUC.

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[61] PR13 consultancy studies can be accessed at http://www.rail-reg.gov.uk/pr13/publications/index.php.
To date we have published the MDST stage 1 work. The NERA report will be published shortly. The MDST stage 2 report is in draft form, and we will publish it when it is finalised.

[62] The VUC (excluding the freight-only line charge), accounts for around two thirds of the cost of track access charges currently paid by freight operators.

[63] The GBFM is a national model of road, rail and port traffic that uses transport costs and journey characteristics to forecast the impact of changes in costs on changes in traffic for each transport mode. It has been used extensively by industry and government. For example, in summer 2011 MDST used it to prepare forecasts for 2020 and for the Rail Freight Group and Rail Freight Operators' Association.

[64] MDST used a rate, as per Department for Transport guidance, of 27.3 pence per HGV tonne km.

Table 6.1: Forecast impact of doubling the variable usage charge, 2018-19

Commodity	% change in tonne kms	Increased revenue (£m)
Other (mostly Nuclear)	0.0%	0.3
ESI Coal	-0.4%	13.4
Other Coal (inc Biomass)	-1.0%	3.9
Iron Ore	0.0%	0.5
Automotive	-10.1%	1.0
Metals	-4.2%	4.6
General Merchandise	-8.8%	0.3
Petro / Chemicals / Industrial Minerals	-11.4%	2.8
Intermodal	-12.9%	20.3
Domestic Waste	-12.3%	0.2
Construction materials	-14.8%	5.2
All rail freight	-8.9%	52.5

6.9 Table 6.2 shows the results of MDST's assessment of the external impacts of freight switching from rail to road as a result of increases in track access charges. It assesses the external costs if all traffic it forecast that was lost to rail, transferred to road. As the last column seeks to illustrate, the propensity to switch between road and rail varies significantly by commodity.

Table 6.2: Double VUC: impact *IF* all the traffic lost to rail were to switch directly to road

Rail freight market segment	Δ revenue (£m)	Δexternal costs (£m)	Ratio Δ external cost : Δ revenue	Propensity to switch from rail to road, if lost from rail
Other (mostly Nuclear)	0.3	0.0	0.00	Low
ESI Coal	13.4	0.5	0.03	Low
Other Coal (inc Biomass)	3.9	0.3	0.07	Medium
Iron Ore	0.5	0.0	0.00	Medium
Automotive	1.0	0.3	0.28	High
Metals	4.6	1.7	0.38	Medium
General Merchandise	0.3	0.2	0.78	Medium
Petro / Chem / IndMin	2.8	4.1	1.45	Medium
Intermodal	20.3	33.4	1.64	High
Domestic Waste	0.2	0.4	1.76	High
Construction materials	5.2	10.6	2.03	Medium
All commodities	52.5	51.4	0.98	

How we have used this analysis

6.10 In considering which markets should have the charge applied to them we have researched their elasticity and their propensity to switch to road. We are not considering levying the charge on any market segments other than those that are both highly inelastic and face little competition from road. We consider that this approach would be proportionate and would also be consistent with our approach in PR08 with respect to freight-only lines and with our statutory duties including our duty to contribute to the achievement of sustainable development. On this basis we:

(a) conducted further research on the impacts of higher charges on the four least elastic market segments, namely ESI coal, “other coal” (including biomass), spent nuclear future and iron ore; and

(b) propose not to levy this charge on the other rail freight market segments.

Modelling the impact of increasing track access charges on the ESI

Scope of work

6.11 We appointed consultants NERA to undertake an analysis of the likely impact of increases in VUC on demand for ESI coal, nuclear and biomass for electricity generation by the ESI.

6.12 The work by MDST showed that certain freight market segments serving the ESI were highly inelastic to increases in track access charges, but did not examine the ESI in detail. In addition, the work was limited to considering a mark-up of up to the equivalent of doubling the current VUC, whereas a charge calculated to recover freight avoidable costs would probably be a higher level. We commissioned NERA's study to strengthen our understanding in these areas.

6.13 We asked NERA to assess six options for increasing track access charges above the current level paid by each of the three commodities. The six options were as follows[65]:

(a) increases of £5, £10 and £15 per thousand net tonne km[66];

(b) a variant of the £10 increase, where half the increase is distance related, set to raise the same amount of additional revenue as the £10 option, an increase of £5 per thousand net tonne km plus £0.765 pence per tonne;

(c) a higher increase of £25 per thousand net tonne km; and

(d) a much higher increase of £100 per thousand net tonne km for nuclear traffic.

6.14 The first three options were intended to span possible freight avoidable costs, on the basis of the preliminary analysis we describe in chapter 5. The last two options, rather than realistic policy options, were used to test the sensitivity of demand and identify the presence of 'tipping points' within markets, as well as testing the proposition that the demand elasticity for nuclear is very low.

6.15 In response to feedback from stakeholders, we also asked NERA to consider the wider impacts of charges increases on:

(a) the Scottish open cast mining industry;

(b) domestic and industrial electricity bills; and

(c) electricity supply/generation related investments.

6.16 As part of its study, NERA consulted a wide range of relevant stakeholders including relevant departments in the UK and Scottish governments, freight operating companies and individual companies and representative organisations from the ESI and coal mining industries.

[65] In practice, track access charges are levied on the basis of gross tonne miles, which include unladen traffic and the weight of locomotive and wagons. For ESI coal traffic, MDST assess that the average VUC of £2.25 per thousand net tonne km is equivalent to a charge of £1.80 per kgtm. In addition, the freight-only line charge amounts to £0.60 per thousand net tonne km.

[66] The £10 option is equivalent to an increase of £8 per thousand gross tonne miles, or, for ESI coal, a three to four-fold increase in charge relative to the variable usage charge and freight-only line charge (extra £10 in addition to £2.25+£0.60).

Overview of NERA's approach to modelling the ESI

6.17 NERA used its 'EEsyM' Model to model the impact of the options on demand for ESI coal, nuclear and biomass. This is a well-established model of the GB electricity market, which NERA has used extensively to advise power sector clients in litigation and due diligence.

6.18 The model determines demand for each fuel according to its relative cost of production. The differences in the marginal cost of plants define a ranking or "merit order" of generators, in which plants are ranked in order of increasing marginal cost. The market price is set by the marginal cost of the most expensive generator operating at a given demand level. Generally renewables and nuclear have a very low marginal cost of production and therefore are higher in the merit order i.e. called on first. Coal and gas are more expensive, and their relative prices fluctuate, for example by season and by plant.

6.19 The model optimises investment in new thermal power generation capacity, which it models to come online if the capacity can be profitably developed. It also selects the timing of closures of existing thermal generators, by comparing their earnings with their avoidable fixed costs. It reflects trends in investment and constraints imposed by certain EU directives, including the Large Combustion Plants Directive[67] (LCPD) and the Industrial Emissions Directive[68] (IED).

6.20 For the first stage of its analysis, NERA used its model to derive a base case demand forecast for each fuel in GB power market (with no changes to track access charges). The forecast depended on a number of assumptions regarding variables including fuel and $C0_2$ price forecasts.

6.21 For the majority of model runs, NERA assumed that the increase in track access charges is passed on in full to each generator. NERA also assumed no switching in coal sourcing and transport decisions as a result of changes to charges. Hence the increase in the delivered price of coal faced by each generator is modelled as being the product of the increase in VUC and the average distance the coal travels to each respective power station.

6.22 NERA's model is of changes to demand for fuel, and does not explicitly model changes to transport patterns as a result of the increased track access charge, in particular changes to origins and destinations. To illustrate the potential impact of these effects, NERA carried out a sensitivity test on the central £10 per thousand tonne km increase option, by assuming:

(a) Scottish coal producers absorb some of the increase to remain competitive: and

(b) generators that currently import coal from distant ports switch traffic to closers ports.

NERA also carried out a sensitivity test based on the impact of the long term trend in gas prices, up to 2030, using a 'low price scenario', in which European gas prices remain constant in real terms.

Results of NERA's analysis

6.23 Table 6.3 summaries the result of NERA's modelling of the impact on demand for ESI coal for each of the main options tested. It shows that for the £10 increase per thousand net tonne km, tonnes of ESI coal

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[67] The Large Combustion Plants Directive: This directive stems from 2001 and so any opt-in decisions have already been made. Plants could either 'opt-in' by fitting extra equipment (flue gas desulphurisation (FGD) to reduce SOx emissions or 'opt-out' of this directive. Plants which have opted out have to close by end of 2015 and can run for a maximum of 20,000 hours over the period 2008-15.

[68] The Industrial Emissions Directive: This directive will supersede the LCPD and applies only to plants 'opted-in' to the LCPD. Plants can 'opt-in' to this directive and accept stricter emissions limits or 'opt-out' which means they will have to close by 2023.

transported by rail is forecast to fall by 4.6%. The forecast fall in tonnes moved is slightly larger at 5% (though this does not take into account changes in transport patterns).

Table 6.3: Modelled demand for ESI coal (2014-18)

Option	Coal lifted		Coal moved	
Change per thousand net tonne km	Million tonnes	% change	Million tonnes	% change
Base Case	178	0.0%	27,889	0.0%
£5 increase	174	-2.1%	27,221	-2.4%
£10 increase	170	-4.6%	26, 501	-5.0%
£15 increase	165	-7.4%	24,466	-8.1%

Note: NERA's model of coal moved does not take account of changes to transport patterns.

6.24 NERA's analysis suggested that the impact of increases in VUC for ESI coal of between £5 and £15 was insufficient to force the early closure of any coal powered power stations in the period up to 2020 (due to the charge increase as opposed to other factors), although it may mean that coal power stations will run less frequently, with this impact likely to be greater for power stations that source coal from longer distances.

6.25 Table 6.4 below shows the forecast increase in revenue as a result of each option tested. It shows the average annual increase, for the £10 option, is £53 million per year. NERA's estimate of the additional revenues is the net result of the:

(a) additional revenue from the £5, £10, £15 increases in track access charges per thousand net tonne km for the coal traffic that continues running despite the higher level of charge; and

(b) reduction in freight-only line revenue from the estimated reduction in total ESI coal traffic.

6.26 NERA did not take account of the reduction in income from VUC (or other variable charges such as the capacity charge or the charge for EC4T), as Network Rail would also be expected to benefit from a similar sized reduction in its variable costs.

Table 6.4: Modelled net increase in Network Rail's GB revenues as a result of changes in charges

Change in Network Rail's revenue net of costs, £ million, 2010-11 prices, relative to base case						
	2014	2015	2015	2017	2018	Total
£5 increase	25.7	26.2	27.5	29.6	26.7	135.7
£10 increase	49.5	50.9	53.7	57.9	52.1	264.1
£15 increase	70.4	72.7	77.8	84.4	75.1	380.4

Impact on nuclear

6.27 The impact on demand for nuclear of increases in track access charges is very low. This is because the very low marginal cost of nuclear means that its position in the merit order is unlikely to change. In addition track access charges form a very small proportion of total variable cost of operating a nuclear plant. Furthermore, because of security and for political reasons it is unlikely that nuclear fuel would be transported by any mode other than rail, so in this respect the associated demand for rail freight is highly inelastic. NERA confirmed this by testing an increase in freight access charges for spent nuclear fuel of £100 per thousand net tonne km. Rather than being a realistic policy option, this was simply designed to test the proposition that the demand elasticity for nuclear fuel with respect to track access charges is very low. Even with this high increase, the model showed no impact whatsoever on demand for nuclear fuel in the short to medium term. In the longer term there may be effects related to nuclear decommissioning or life-extensions due to the impact of freight access charges on the overall profitability of nuclear plants.

6.28 The impact of the charge will affect the nuclear power generation industry in two ways:

(a) a cost effect: higher track access charges will be passed on to nuclear electricity generators; and

(b) potentially increased revenue: higher track access charges for ESI coal will increase the cost for coal, and hence increase the market price of electricity, at points where coal is the price setter.

6.29 If charges are levied per net tonne km, NERA's modelling suggests that nuclear's margins increase – by between 0.3% and 0.9% under the main three options being tested[69]. This finding may not hold true, however, if the charge were per gross tonne km, because the charge for spent nuclear future relative to ESI coal would be higher.

Impact on Biomass

6.30 Due to the emerging market nature of biomass there is greater uncertainty about the impacts of increases in track access charges on demand for biomass. In addition, as a renewable fuel, biomass is

[69] NERA defined margins as being power market revenue, less variable costs of production, including fuel commodity and transport costs.

subsidised, and an increase in costs of biomass, such as through increased track access charges, might lead to a compensating increase in its subsidies.

6.31 The UK has a legally binding target under the EU Renewable Energy Directive to increase the share of renewables in final energy consumption. To meet this target, power generators that use biomass are subsidised through the Renewables Obligation scheme[70]. The costs of this scheme are funded by a levy on customers' electricity bills. For each unit of energy produced, power generators are awarded Renewables Obligation Certificates (ROCs). Generators can sell these credits to electricity suppliers, who buy them to comply with their obligation to present a certain number of credits to the energy regulator, Ofgem.

6.32 Some biomass is used in coal-fired power stations through "co-firing", whereby a small quantity of wood pellets or other forms of biomass are blended with coal in the combustion process. Biomass usually only makes up a small proportion of fuel burned. The change in demand for biomass for use in co-firing following an increase in track access charges is therefore determined largely by the impact on demand for coal. The precise impact will depend on the unit of the track access charge, because biomass has a lower calorific value than coal and a different mass to coal.

6.33 Most existing dedicated biomass power stations have been developed on a small scale, and so are likely to purchase biomass from their local areas and make little use of the rail network. The impact of subsidies means that biomass marginal cost at some plants may be zero or negative. Hence, just as for nuclear fuel, demand for biomass from a dedicated power station is likely to be unaffected by changes in track access charges, in such instances where the biomass is transported by rail.

6.34 There is a great deal of uncertainty about the extent to which new plants will rely on rail. Some plants may be inland but many plants may locate to existing ports because a high proportion of biomass is likely to be imported. Higher track access charges are likely to make port locations more attractive relative to inland locations. However, increases in track access charges might impact on investment and location decisions for new biomass plant.

Impact on electricity bills

6.35 Under the option to increase track access charges for ESI coal by £10 per thousand net tonne km, NERA estimated that the weighted average wholesale electricity price would increase by about 0.5% for each year from 2015 to 2020. NERA estimated that this would result in a less than 0.2% increase in domestic users' annual electricity bills, or less than £1 a year. (An increase in track access charges for spent nuclear fuel does not result in increases in customers' prices for electricity because the cost of nuclear fuel does not set the electricity price.)

6.36 Although, it is more difficult to assess the impact on larger, industrial users of electricity, NERA's analysis suggests that on average the impact on these customers' bills is very similar to that of domestic users.

Scottish open cast coal

6.37 Scottish open cast mining produces around six million tonnes of coal per year, which is around one third of UK coal production. Output has remained relatively stable over the past 15 years despite large fluctuations in international coal prices (which determine its prices).

[70] In England and Wales the scheme is referred to as the Renewable Obligation (RO); in Scotland it is referred to as Renewable Obligation Scotland (ROS).

6.38 The average length of haul on Anglo-Scottish coal flows is nearly 450 km, compared to just over 100 km in England. Hence, an increase of £10 per net tonne km would increase the cost of Scottish coal to English power stations by around £4.50 per tonne compared to almost £1 per tonne for flows within England.

6.39 NERA's analysis is that over the short term, Scottish open cast mines are likely to absorb the cost of higher VUC because:

(a) even with a £10 increase in charges per thousand net tonne km, the impact on the delivered price of Scottish coal is still relatively small compared with changes in international coal prices, and prices remain higher than 5 to 7 years ago (and are expected to continue to do so); and

(b) in any case, for existing mines, continued extraction remains worthwhile, even at lower prices. In the case of significant price reduction, there may be certain parts of sites that may become uneconomic. But once a site has been developed and is operational, for the most part it will be worthwhile for extraction to continue even if prices are somewhat lower than expected.

6.40 NERA suggests that track access charge increases may impact on decisions to develop future open cast locations (and the international price of coal is typically more important in deciding this than track access charges).

Impact on current and planned investments

6.41 NERA's analysis suggests that the main way in which increases in track access charges increases impact on investment decisions for coal fired generation is whether to opt in/out of the IED. Opting in requires significant investment in equipment to reduce NOx emissions. NERA estimates that an increase in track access charges of £25 per thousand net tonne km (the option tested to explore whether there were demand tipping points) would at the most reduce the amount of coal capacity opting into IED by 2 gigawatts GW (out of a total of around 10 GW).

Investment by rail industry organisations

6.42 The forecast fall in demand for coal over the next few years (irrespective of any change to track access charges) means there is unlikely to be much further investment in rolling-stock and loading/unloading facilities (particularly given recent large scale investment in these assets).

6.43 Biomass, as a new market for rail, may lead to investment in new wagons or the conversion of existing wagons. An increase in track access charges could impact on such investment. However, NERA notes the extent of the impact will depend on policy to ensure biomass meets its renewable energy targets (e.g. the level of subsidy). But in any case the impact of VUC increases on investment might be relatively small given the more extensive uncertainty about how the biomass market will develop and the opportunities it presents for rail.

6.44 NERA noted that the forecast fall in demand for coal - irrespective of any change to track access charges - could mean that competition between freight operators for remaining coal traffic might intensify, perhaps leading to a reduction in margins. This could potentially lead to changes in market structure (for example through exit or merger) and also therefore to a reduction in competition in the market.

Our interpretation of NERA's findings

6.45 NERA's analysis provides us with estimates of how increases in track access charges change demand for ESI coal and spent nuclear fuel. For example, NERA forecasts that an increase in track access charges of £10 per thousand net tonne km will lead to a fall in demand for ESI coal of around 5%.

An equivalent increase in charges for spent nuclear fuel does not result in a material fall in demand for nuclear fuel.

6.46 NERA considers changes to transport patterns in qualitative terms and through an option to illustrate potential impacts. It does not model such changes explicitly. Hence the impact of such a charge on tonne km could be considerably larger, because customers might respond to the price rise by changing their source of coal or choice of port for example, but we would need further analysis to explore this (which we have done in the MDST stage 2 work described below).

6.47 Some stakeholders have challenged the base case forecast, which are different to other published forecasts including those of DECC. We consider that NERA has explored the significance of the widely acknowledged uncertainty in the base case forecast of coal demand through its sensitivity test on gas prices (which have a major impact on coal demand). This analysis suggests that the demand impacts of the charge are not sensitive to changes in the base forecast.

6.48 NERA stated that it expects Scottish mines to largely absorb the costs associated with higher increases in charges (over and above those for other coal journeys due to longer average length of haul), at least in the short to medium term. NERA makes this assessment, in part, noting that production has remained at broadly stable levels over the last 15 years despite significant fluctuations in international coal prices, and hence the mines are behaving as price takers. Stakeholders have challenged this, in part on the grounds that the mines do not have the profit levels to absorb such costs. Our understand is that this may be a consideration for future investment decisions, as NERA note. But profit levels can be a poor indicator of the case for continuing to mine coal, given that many of the costs may be sunk.

6.49 Declining coal traffic, irrespective of any change to track access charges, means that further significant investment in coal wagons, for example, is unlikely to occur and could mean that the level of competition between freight operators (relatively high in historic terms) falls. Higher track access charges may exacerbate any such effects, but, we reason, as their impact on demand is small relative to underlying trends in demand for coal, such incremental effects would be proportionately smaller.

6.50 The impact on the biomass market is hard to predict because it depends upon whether and how subsidies are adjusted in order to ensure renewable targets are still met. In addition, as it is not clear how biomass generating capacity might be provided or located, it is difficult to assess its sensitivity to charges.

Further analysis of higher track access charges

Scope of work

6.51 We then asked MDST to conduct further work testing the impact of charges that reflect freight avoidable costs on demand for rail freight. This analysis differed from MDST's earlier work because:

(a) the options were set based on our estimates of recovering freight avoidable costs (MDST's earlier work relating to lower increases in track access charges) – these options were also tested by NERA and are described in the previous section;

(b) the analysis was restricted to market segments which MDST had already identified as being highly inelastic; and

(c) MDST modelled changes to the origins and destinations of ESI coal traffic as a response to changes in demand (as well as other effects that it had previously modelled, such as switch to road transport).

6.52 As with its earlier work, MDST modelled the scope to switch between road and rail, as well as between ports; and was informed by the results of the NERA analysis in its modelling of ESI demand for rail freight.

6.53 We asked MDST to model potential changes to origins and destinations, for example through switching the choice of power station, or pit/port. This work should be regarded as illustrative only, in that it was based on a modelled response to changes in price and some important parameters were not based on empirical evidence or calibration (though they were tested for their sensitivity). In practice there are a number of constraints that limit the rationalisation of journeys, for example the quality of coal required for particular power stations, or rail infrastructure bottle necks, that MDST did not model explicitly. MDST's model did attempt to reflect systematic differences in cost, however, such as might be achieved by sourcing coal from larger ships that can only serve certain ports.

MDST's approach to modelling large increases in track access charges

6.54 In order to estimate the market response to large increases in track access charges, MDST developed its Coal Power Station Transport Model (CPSTM) for ESI coal. MDST's model employed the industry-standard multinomial logit formulation and involved the following stages:

(a) estimate an origin-destination (OD) matrix of base year rail and road freight traffic using actual 2011 traffic data;

(b) estimate corresponding base year costs for each mode and each pair of origins and destinations, including track access charges and costs associated with each pit, port and power station (where these costs could in part be proxies for differences in quality);

(c) estimate the sensitivity to changes in cost for the base year by calibrating the base year model;

(d) use this calibrated model to estimate demand impacts of changes in charges for 2018-19, assuming no change in the ESI coal traffic level or rail freight costs in the do-minimum scenario. The model directly estimates the impact of increased track access charges on:

(i) destination choice: where ESI coal traffic shifts to shorter hauls, often to closer power stations;

(ii) route choice: where traffic shifts to shorter routes by rail, where possible; and

(iii) mode choice: where rail freight traffic shifts to other transport modes, usually road; and

(e) MDST then estimate two further demand responses, as add-ons to the core demand model:

(i) a suppression response: where power stations reduce their electricity production due to the higher cost of delivered coal, as a result of increased track access charges. This response is usually included as part of a best-practice four stage transport demand model: the other three stages are included above as part of the core model (destination choice, mode choice and route choice); and

(ii) a cost absorption response: where pits or ports with reduced traffic may choose to absorb some of the additional transport costs due to the track access charge increases, in order to retain more of their traffic.

6.55 The results are then captured for the various options, each corresponding to different levels of charge increase.

6.56 For the other inelastic commodities, MDST estimated the impact of the options using diversion analysis based on the relative costs for alternative routes and modes (primarily road transport).

MDST analysis of ESI coal

6.57 MDST estimated that the £10 per ktkm increase in charges is forecast to reduce total tonnes consumed by power stations by 2.6%, compared to the 4.6% estimated by NERA (NERA's study only considers the energy market response, and did not take account of the extent to which pits might lower their price to compensate for increased track access charges)[71].

6.58 For this option, MDST's indicative estimate was that total tonne kms by rail would fall by 23% (with a range from sensitivity testing of 18 to 30%) and Network Rail revenue would increase by around £40 million in 2018-19. Although this reflects a substantial impact on demand for rail freight in this particular market segment, we note that:

(a) the analysis did not take into account a number of factors that constrain haul rationalisation, for example constraints on quality of coal; and

(b) average length of haul for ESI coal is in any case very volatile. For example, it averaged around 150km in 2004, before rising to as much as 200km for a quarter in 2007, before falling back below 150km (a similar variation to that being forecast by MDST). ESI coal traffic is forecast to fall substantially in the next few years – irrespective of track access charging policy – and this may result in the trend for reducing length of haul continuing as the incidence of rail infrastructure bottlenecks, for example, is reduced.

6.59 Falls in demand for coal over the next few years are expected to cause knock-on impacts for some pits and ports; there would be 'winners' and 'losers' in terms of impact on profitability or, conceivably, viability. An increase in track access charges may exacerbate these effects.

6.60 One impact of track access charge increases on other stakeholders is expected to be a worsening in the bargaining position for Scottish pits and the more remote ports. For example, for an increase of £10 per thousand net cargo tonne kms and our central assumption on levels of response, the Ayrshire pits are forecast to face a reduction in demand and cut charges by £2.5 per tonne. By contrast, pits that are close to the Aire Valley power stations would benefit (forecast +£0.6 per tonne) as would (marginally) the Humber ports.

6.61 MDST estimated that coal tonnes transported from road-only pits would increase by around 15% under this option, but that overall coal tonnes transported by road would fall. This is because there would be a decline in traffic from some pits that are not rail-linked that require road transport to the rail connection.

MDST analysis of spent nuclear fuel

6.62 MDST's analysis shows that rail transport of spent nuclear fuel is already substantially more expensive than road transport. The commodity is transported by rail because it is safer and more secure. The options have little impact on these relative costs, and therefore would be unlikely to result in a switch from rail to road.

6.63 The cost of shipping spent nuclear fuel is also higher than that of rail.

[71] MDST's results quoted in this section are taken from its draft stage 2 report. It is possible that there may be minor revisions to numbers prior to publication.

MDST analysis of iron ore

6.64 MDST estimates that the road transport costs of transporting iron ore are currently around three times that of rail transport costs. The options for increasing track access charges do little to change that balance, so we would expect the iron ore to continue to be transported by rail.

6.65 MDST also compared the increase in track access charges with the total costs of iron ore and steel. At current prices, it estimated that an option to increase track access charges by £10 per thousand net tonne km would increase the cost of iron ore by around 0.3%. This would translate into an increase in cost of steel equivalent of around 0.1% of its price[72].

MDST analysis of other coal (excluding biomass)

6.66 MDST also analysed rail coal traffic used for purposes other than electricity generation. Its stage 1 analysis found that overall these flows, including biomass, were highly inelastic.

6.67 This coal is used as fuel for a variety of industrial purposes, including production of steel and cement. MDST show that the leading flows of coal by rail have good rail connections, and there is little prospect of competition from road.

6.68 Much cement is already transported long distance by road. MDST's earlier analysis, in Table 6.1, showed that this was a commodity ("construction materials") which was relatively sensitive to increases in track access charges. MDST reasons that increases in track access charges for coal supplying cement plants may have a similar impact, with a transfer of cement traffic away from rail to road.

MDST analysis of biomass

6.69 MDST has undertaken a detailed review of use of biomass for electricity generation, and its implications for rail freight. Among the points it noted are:

(a) recent policies, in both England and Wales and Scotland, have promoted domestic, rather than imported, sources of biomass (in part because of uncertainty regarding the sustainability of certain imported biomass);

(b) DECC announced changes to the renewable obligations subsidy regime in 2011 which will apply from 2013 to 2017; the Scottish Government has also recently consulted on its eqivalent scheme;

(c) most planned and proposed larger dedicated biomass stations are sited in close proximity to deep water ports, and hence are unlikely to use rail freight to any significant degree; and

(d) earlier this year, Drax announced that it had cancelled plans to develop a biomass plant adjacent to the power station because it says that at the proposed level of subsidy it is unviable.

6.70 It is therefore unclear as to whether in the future there will be significant biomass transported by rail.

Our conclusions from the market analysis

6.71 We made an assessment of the market segments to which the charges should apply following the requirements of the Access and Management Regulations (as set out in paragraph 4.31). As explained above, on the basis of MDST's stage 1 analysis, we decided to consider four market segments in greater detail:

[72] Calculated using commodity prices of May 2012.

(a) ESI coal;

(b) spent nuclear fuel;

(c) iron ore; and

(d) other coal, for which we considered biomass separately.

6.72 We proposed not to levy a new freight charge on the other freight market segments on the basis that they faced significant competition from road freight and had more elastic demand. We consider that this approach is proportionate and consistent with our approach in PR08 with respect to freight-only lines and with our statutory duties including our duty to contribute to the achievement of sustainable development.

6.73 MDST and NERA analysed the impacts of levying increased track access charges which were set, in very broad terms, at levels to reflect the freight avoidable costs associated with the market segments.

6.74 The further analysis found that demand for ESI coal is not sensitive to changes in track access charges: a charge representing around a four-fold increase on current charges was forecast to be associated with a reduction of 5% in ESI coal lifted. The fall in demand for rail freight transporting the coal (coal moved), however, may be much more substantial because there is scope for reductions in length of haul. Indicative analysis suggested a potential reduction of 25%, though continued rationalisation of length of haul may to a large extent occur in any case as coal traffic continues to fall in response to the introduction of stricter environmental standards.

6.75 On the basis of our analysis and as against the two principal criteria for proposing a charge that we set out in paragraph 6.2, we propose that it would be efficient to levy the new freight charge on ESI coal traffic and that it is not likely to lead to exclusion of the use of the infrastructure for the transport of ESI coal. We also think that levying the charge on ESI coal traffic would be in accordance with our section 4 duties including having regard to the funds available to the Secretary of State, the expenditure to be incurred by Scottish Ministers and to promote efficiency and economy on the part of person providing railway services. We propose that the new charge would be levied on ESI coal and calculated to recover the market segment's share of freight avoidable costs. However, we recognise that the balancing of our statutory duties, in particular to promote the use o the rail network for the carriage of goods, also might suggest that protection should be built into the charge to prevent it resulting in a large fall in ESI coal traffic. Therefore we are proposing that the charge could be adjusted where the forecast demand for this traffic falls above a certain defined percentage point. We have suggested that this threshold could be 10% but we would be interested in your views.

6.76 The analysis showed that the level of rail freight traffic transporting spent nuclear fuel is not affected by the increase in track access charges we have considered. Using the same reasoning we have described with respect to the ESI coal market segment (paragraph 6.75), we are consulting on levying a charge on spent nuclear fuel. We propose that the charge would be calculated to recover the market segment's share of freight avoidable costs. In principle the charge could be capped so as to reduce the demand impact of the charge, but our analysis shows that the inelasticity of this market segment is such that such a cap is unlikely to be relevant.

6.77 The analysis showed that the level of rail freight traffic transporting iron ore is not affected by the increase in track access charges we have considered. In contrast to power generation, stakeholders have highlighted the risk that this industrial process could relocated in the longer term to another site in the UK or elsewhere. If the charge were to prompt such an outcome, it would be inconsistent with the Regulations because it would have resulted in a market segment being excluded. However our analysis suggests that

the options for track access charges we have considered amount to less than 0.1% on the margin of the commodity price, and hence the risk of this appears to be very limited.

6.78 Hence, as against the two principal criteria for proposing a charge that we set out in paragraph 6.2, we propose that it would be efficient to levy the new freight charge on iron ore traffic and that it is not likely to lead to exclusion of the use of the infrastructure for the transport of iron ore. We also think that levying the charge on iron ore would be in accordance with our section 4 duties including having regard to the funds available to the Secretary of State, the expenditure to be incurred by Scottish Ministers and to promote efficiency and economy on the part of person providing railway services. We propose that the new charge would be levied on iron ore traffic and calculated to recover the market segment's share of freight avoidable costs. As with spent nuclear fuel, we do not see that a cap to reduce the demand impact of the charge is relevant for this market segment. However, we recognise that, unlike ESI coal and spent nuclear fuel, there is a theoretical risk that this market segment might be excluded from use of the infrastructure as a result of the charge (though this risk does not appear to be significant), and we particularly welcome stakeholders' comments on the analysis and other relevant factors that they wish to draw to our attention.

6.79 We also considered whether to levy a charge on rail freight transporting coal for industrial purposes other than electricity supply. For the main such flows, our analysis shows that road transport costs are significantly higher than rail costs. Much of this coal is used to supply cement works, however, and cement is already transported long distance by road to a significant degree. Our analysis found that cement ("construction materials") was relatively sensitive to increases in track access charges, and faced strong competition from road haulage. Hence it would be less efficient to levy a charge on this market segment than the other market segments we have proposed. We are considering further whether it is appropriate to levy a charge on "other coal", or potentially subdivide it into further market segments and apply the charge differentially (so that it were levied where there is less strong road competition, for example). We seek consultees' views on this.

6.80 Currently, very little biomass is transported by rail. This is an emerging market, and it is not yet clear whether there is prospect for a substantial increase in such traffic. Current indications, however, are that there is not. In addition, the financial viability of biomass is influenced by its associated subsidy and this has recently been fixed in England and Wales for 2013 to 2017, and been subject to consultation (now closed) in Scotland. At the same time, analysis by NERA suggests that biomass transported by rail is likely to be highly inelastic. At this stage, we consider that:

(a) in principle it may be appropriate to levy a track access charge on rail freight transporting biomass to recover its share of freight avoidable costs, but that

(b) uncertainty in the development of this market means that we do not propose to determine such as charge as part of PR13.

6.81 We propose to engage with DECC and the Scottish Government at the point when the renewable obligation regimes are reviewed, so that if we were to levy a charge, either for the next control period (CP6) or from the introduction of the new rates of credit, this would be taken into account in the calculation of the renewable obligation credit.

6.82 Table 6.1 summarises our proposals for the new charge for each individual rail freight market segment.

Table 6.1: Summary of our proposals for a new charge for individual rail freight market segments

Rail freight market segment	Propose to levy a charge to recover market segment's share of freight avoidable costs?
Coal for electricity supply industry	Yes, subject to cap so that forecast traffic does not fall by more than a set percentage (10%?)[73]
Spent nuclear fuel	Yes
Iron ore	Yes (but we particularly seek stakeholders' comments on our analysis, recognising the theoretical possibility of excluding this market segment from use of the infrasturcture).
Biomass	Not as part of PR13, because the market is not yet sufficiently developed. But revisit for CP6 or point where subsidy is revisited (2017).
Coal transported for other purposes	We are considering this further.
Other freight market segments	No, on basis that these markets are more elastic and face greater competition from road freight. This approach is proportionate, consistent with our approach in PR08 with respect to freight-only lines, and with our statutory duties including our duty to contribute to the achievement of sustainable development.

Consultation questions

6.83 Do you have comments on our write-up, interpretation and application of the studies carried out by MDST and NERA? Is there any further evidence that you believe should be considered?

6.84 Do you agree with our proposal, on the basis of MDST's analysis, to not levy a mark-up on certain rail freight commodities, including intermodal, construction materials and metals?

6.85 Do you agree with our proposal to levy the proposed charge on ESI coal traffic:

6.86 Do you agree with our proposal to levy the proposed charge on spent nuclear fuel traffic?

[73] The principle of the cap would apply to all market segments to which the charge is levied; but for certain market segments, such as spent nuclear fuel, the forecast demand impact of the charge is negligible so that the cap has little practical relevance.

6.87 What views do you have on our analysis of the iron ore market segment? Do you consider that there is also a case for levying the proposed charge on iron ore?

6.88 Do you agree that we should revisit our policy on levying a charge for the biomass market segment to coincide with the recalculation of its credit (subsidy) regime (from 2017 for England and Wales)?

6.89 Do you consider that the proposed charge should be levied on other (non ESI) coal flows?

7. Consultation questions & next steps

Next steps

The consultation and workshops

7.1 We will be holding an industry workshop on Friday 18 May 2012 to discuss the topics in this consultation. Recognising the importance of this topic to certain individual stakeholders, we will hold a further workshop on Thursday 5 July. Attendance at the workshop is open to all but requires prior registration. Details can be found on our website (www.rail-reg.gov.uk/pr13).

7.2 Four consultancy studies were undertaken to support this consultation. They are being published on our PR13 website at http://www.rail-reg.gov.uk/pr13/publications/index.php. To date, the review of analysis in Network Rail's freight cap consultation, by Arup (March 2012) and MDST's stage 1 report (February 2012) have been published. The NERA report will be published shortly. The MDST stage 2 report is currently in draft form, and we will publish it when it is finalised.

7.3 The consultation closes on Friday 10 August 2012. This is an important consultation, and we very much welcome stakeholders' input and formal responses. We also appreciate the contributions stakeholders have made in the work conducted to date in preparing this consultation.

Refining variable costs

7.4 The reporter Arup classified Network Rail's work on cost variability on its civil structures and earthworks to be of "red" status, which means that the analysis included at least one area of major concern. In both these cost categories, Network Rail prepared its estimates of cost variability using engineering judgement with no firm evidence on the quantified impact. Responding to the reporter's concerns, Network Rail refined its work on civil cost variability in advance of its March 2012 freight caps conclusions.

7.5 We are now asking Network Rail to use reasonable endeavours to improve its estimates further within a timeframe that informs our conclusions on this work. In particular, we are asking Network Rail to structure and document the basis for its estimates of cost variability for civil structures and earthworks in a manner analogous to its work on signalling variable costs. Beyond the timeframe of this periodic review, a more detailed assessment will be appropriate.

7.6 In addition, work on refining Network Rail's costs and efficiency assumptions will continue as the periodic review. The key milestones are Network Rail's strategic business plan, to be published in January 2013, and our draft and final determinations, to be published in June and October 2013 respectively.

7.7 Work is also progressing to disaggregate the variable charge by vehicle. Network Rail will consult on this over the next few months. In addition, we are exploring options to disaggregate the charge geographically.

Estimating freight avoidable costs

7.8 Over the next few months Network Rail is preparing its estimate of freight avoidable infrastructure costs. It is commissioning consultants to undertake this work, and they are expected to conclude in August 2012. Network Rail will be engaging with stakeholders during this study, and we will also subject the work to independent scrutiny. We will use the results of this study to inform our conclusions to our consultation. But we expect the estimates to be further refined as PR13 progresses.

Concluding on this consultation

7.9 We will publish our conclusions to this consultation in November 2012. We will use the results of the consultation and Network Rail's work on freight avoidable costs to set out caps on freight specific charges, (in the form of £ per kgtm, though the charge may not ultimately be levied on that basis).

7.10 As part of this we expect to confirm the commodities to which the charge would apply. We may also confirm the basis for the allocation and the units of the charge, though this may be subject to further consultation.

7.11 At the same time, we will confirm a cap on the average variable usage charge.

List of all consultation questions

7.12 Details of how to respond to the consultation are given in chapter 1. The deadline for consultation responses is Friday 10 August 2012.

7.13 We welcome responses on any aspect of this consultation. In particular we welcome responses to the specific questions we ask throughout this document. These are listed below.

Chapter 3 – variable usage charge

7.14 Network Rail has already consulted on its estimates of variable costs. Do you have any further evidence, subsequent to Network Rail's consultation, that you wish to provide in relation to the process for estimating variable costs and average variable usage charges?

7.15 Do you agree with our analysis, which leads to a proposed confidence interval of 15% around Network Rail's estimates of variable usage costs?

7.16 Do you agree with our approach to estimating an adjustment to variable usage charges for long-run cost efficiency?

Chapter 4 – Framework for a freight-specific charge

7.17 Do you agree with our proposed approach to satisfying the Access and Management Regulations with respect to levying a new freight-specific charge?

7.18 Do you agree that the infrastructure costs allocated to freight operators - either for direct funding by freight operators, or explicitly subsidised by government - should be freight avoidable costs, including fixed costs, but not costs common between passengers and freight?

7.19 Do you agree that we should retain our current definitions of particular categories of rail freight commodities as separate market segments?

7.20 Do you believe that we have taken into account the appropriate factors in considering the efficiency of the proposed charges? Do you believe there are other factors we should take into account?

7.21 Do you agree that our approach (of analysing rail freight traffic) addresses the relevant criteria, when considering which to which market segments the charge should apply?

7.22 Do you agree that certain market segments should be exempt from the new charge?

7.23 What do you think is the most appropriate methodology for allocating costs, and what is your reasoning?

7.24 Do you consider it is appropriate to cap the new charge for particular market segments according to its impact on the associated freight traffic (in addition to a constraint relating to relevant avoidable costs)? Do you wish to propose an alternative?

7.25 What should be the unit of the new charge? Please explain your reasoning.

Chapter 5 – Freight avoidable costs

7.26 Do you agree with our framework for estimating freight avoidable costs? Please explain any suggested changes to the framework, including your calculations (noting that there will be further opportunities to contribute to this work as the cost estimates are refined during the periodic review, for example in relation to Network Rail's strategic business plan).

Chapter 6 – Market Analysis

7.27 Do you have comments on our write-up, interpretation and application of the studies carried out by MDST and NERA? Is there any further evidence that you believe should be considered?

7.28 Do you agree with our proposal, on the basis of MDST's analysis, to not levy a mark-up on certain rail freight commodities, including intermodal, construction materials and metals?

7.29 Do you agree with our proposal to levy the proposed charge on ESI coal traffic:

7.30 Do you agree with our proposal to levy the proposed charge on spent nuclear fuel traffic?

7.31 What views do you have on our analysis of the iron ore market segment? Do you consider that there is also a case for levying the proposed charge on iron ore?

7.32 Do you agree that we should revisit our policy on levying a charge for the biomass market segment to coincide with the recalculation of its credit (subsidy) regime (from 2017 for England and Wales)?

7.33 Do you consider that the proposed charge should be levied on other (non ESI) coal flows?