

**Network Rail October 2007 Strategic
Business Plan**

Supporting document

Structure of charges

1 Introduction

Background & context

Network Rail's task is to provide an optimal suite of rail infrastructure services in the short and long-term. The fundamental basis of this is delivering at efficient cost and we describe elsewhere the comprehensive process we have gone through to derive a robust forecast of our efficient costs¹.

Once these costs are established, the subsequent challenge is to recover them in an efficient manner to:

- ensure the maximal beneficial use of infrastructure capacity at a point in time; and
- provide signals to funders and operators so as to facilitate efficient network development over time. That is, to minimise the whole-system costs. This includes providing incentives around the development of rolling-stock and the nature of enhancements.

The resultant '*Structure of Charges*' is the focus of this document. Charging signals are particularly important where capacity is constrained and strong growth is forecast – as is currently the case across the GB railway. Because of the franchising arrangements some of these signals may impact with a lagged effect – this reinforces the desire to make them accurate.

This supporting document provides the significant detail underlying the summary section included in the *Strategic Business Plan* (SBP). There are many challenges and trade-offs to resolve, including:

- Requirements of various users – including freight, passenger and open-access – who have differing needs and different price sensitivities.
- The lumpy nature of railway infrastructure investment where the costs of providing additional services can be low until a capacity constraint is reached, at which point extra capacity can be expensive and involve significant lead-times.
- Related to the previous, the balance between short- and long-term demands on the network.
- Need to balance transparency and cost-reflectivity against complexity and increased administrative burden on the industry. This has involved consideration of the benefits and costs.
- Tension between cost-reflectivity and the valuation of capacity which is a driver of future enhancement decisions.

The Periodic Review 2008 (PR08) is the first occasion where the Office of Rail Regulation (ORR) has given Network Rail the responsibility for proposing indicative charges².

We have endeavoured to involve stakeholder input and reflect stakeholder concerns in the development of the indicative charges. Notwithstanding this process, the SBP represents a major point of stakeholder consultation on these indicative charges. In some cases we have presented options for consideration and would welcome stakeholder views.

¹ Network Rail (October 2007) *Strategic Business Plan*.

² ORR retains the responsibility in relation to any new charges, such as a reservation charge.

Overview of analysis

We believe that our proposals fully meet the suite of objectives set out by ORR, including the over-arching desire for greater cost-reflectivity. Some of the main workstreams that have informed our proposals include the following:

- Development of the Infrastructure Cost Model (ICM) which has significantly improved our understanding of the cost structure of the business, and the relationships between key variables. This has, for example, allowed us to better understand the short-run marginal costs to be recovered by variable usage charges, and investigate the desirability of route-based charging. It has also facilitated a far more disaggregated understanding of the costs to be recovered via Fixed Track Access Charges (FTAC).
- Extensive work by consultants TTCI (UK) and associated expert technical advice from stakeholders in relation to including a new term in the variable usage charge reflecting the impact of tangential forces on rail infrastructure.
- Cost analysis and charging options for the new freight-only line charge that ORR determined should be levied on ESI coal and spent nuclear fuel traffic.
- Comprehensive modelling to update the capacity charge. This has included both a data-refresh and a refinement of the underlying methodology.
- Deliberations by an industry working group in relation to the electricity for traction charge.

Stakeholder input is clearly of great importance and we have engaged with industry as far as possible within the time available. While the release of the *Strategic Business Plan* represents a key formal step in the consultation process, our proposals have already been shaped by stakeholder views. Our general engagement approach has been to:

- initially discuss emerging views with a targeted audience most directly affected;
- incorporate and address any comments, including completing any necessary further analysis; and
- release for consultation more widely – including placing relevant documents on our website.

Structure of this document

The remainder of this document provides:

- further background and contextual information, including the objectives set by ORR that we must address in making our proposals; and
- for each charge in turn, a description of the process we have undertaken and the resultant charges proposal. This includes:
 - objective of the charge;
 - current approach and issues;
 - methodological approach; and
 - proposal for charging and summary analysis around the implications.

We have endeavoured to provide references to the full-range of supporting analysis and documentation underpinning the analysis summarised here. These are provided through a combination of footnotes, as well as summary guides to further information included at the end of chapters.

2 Purpose of the structure of charges review

ORR requirements – objectives that charging proposals should deliver

This section outlines the guidance from ORR about the nature of the charging proposals. The guidance is useful in establishing priorities and forms a set of criteria against which trade-offs can be evaluated and resolved. The main objectives set by ORR are that the structure of charges should:

- promote the objectives of ORR duties under section 4 of the Act and be consistent with the wider objectives of funders;
- incentivise Network Rail, train operators, train manufacturers, rolling stock companies and funders to ensure the efficient utilisation and development of the network and optimisation of whole industry costs;
- not discriminate between users of the network;
- be practical, cost effective, comprehensible and objective in operation;
- be consistent with relevant legislation, including the EU Directive 2001/14/EC5;
- reflect the efficient costs caused by use of the infrastructure (both to Network Rail or otherwise); and
- ensure that charges enable Network Rail to recover, but not to over recover, its allowed revenue requirement.

Each of the individual criteria is self-explanatory and fairly straight-forward in its interpretation. However, addressing them together involves the balancing of inevitable trade-offs. For example, between the need for cost reflectivity *and* the ability to be implemented in practice, and the need to incentivise optimal short- and long-term development. Our approach has been to transparently identify where such trade-offs are necessary and to outline the reasoning underlying our proposed approach.

A guide to the components of the charging regime

The global objective for the charging regime is to *just* recover our efficient total costs; that is, to neither under- nor over-recover. Given the nature of our cost-base and the need to provide appropriate incentives, the charging regime is more complex than an overall 'average charge'. Instead, a number of individual charges are levied with specific purposes in mind. As far as possible – consistent with achieving the other objectives set out for the charging regime – these charges are levied on those parties that 'cause' the costs. This is challenging given significant 'common' costs across our network.

The following table provides a summary of the charging components.

Table 1 Summary of the intent of the various charging components		
Name of charge	Objective / intention	Issues
Variable usage and route-based charges	To recover short-run marginal costs of additional vehicles on the network so as to provide the right signals to facilitate additional traffic for both operators and Network Rail.	Key decisions around the extent to which charges should vary according to the geographical location of travel, as well as the definition of capability that is assumed. Calculating the short-run marginal costs is a significant task in itself.

Name of charge	Objective / intention	Issues
Freight-only line charge	To give effect to the Government statement in the <i>Future of Rail</i> White Paper (2005) that freight should pay the full cost of freight-only lines.	ORR has set caps for maximum allowed increase in freight charges, as well as determining that only Electricity Supply Industry (ESI) Coal and spent nuclear fuel traffics should bear the new freight-only line charge. Significant exercise to define and cost 'freight-only lines'. Review of the coal-spillage charge to ensure that it fully recovers the cost to Network Rail and incentives future behaviour.
Capacity charge	To recover increased Schedule 8 costs generated by additional congestion on the network because of additional traffic.	Complexities of moving toward a tariff varying by location and time of day.
Electricity for traction charge	Recovering the cost of electricity used by operators.	Providing more direct linkage between the electricity market prices and the charge to electrical traction users. Related to this, providing users with greater input into the decision-making process around purchasing decisions.
Station charges	Recover from users the maintenance, repair and renewal costs of stations.	Analysing the options and trade-offs around the costs of stations in total, the costs of additional usage at the margin, and the usefulness of price signals under the existing arrangements.
Fixed charges	To recover the residual revenue requirement netting off single-till income and government grant.	Levied on franchised TOCs only. The emphasis is on identifying a methodology that has a much tighter connection with cost-causation.

The remainder of this document provides further detail around the analysis we have conducted to guide our specific proposals.

Further information

Table 2 Further information		
DOCUMENT NAME	DESCRIPTION	LINK / LOCATION
Various ORR guidance documents. For example: <i>Summary of Advice to Ministers and framework for setting access charges document</i> (28 February 2007)	Set out requirements and objectives for Network Rail to address in the PR08 process.	Full list of ORR documents and consultancy reports available at: http://www.rail-reg.gov.uk/server/show/nav.180

3 Variable usage and route-based charges

Context

The last full review of usage charges was undertaken as part of the Periodic Review 2000. At that time it was recognised that usage charges provide a beneficial incentive on operators in relation to services and rolling stock deployment across the network. This in turn has implications for the efficient use of existing capacity and the development of future capacity.

The current variable usage charges are based on a network-wide average rate for each vehicle type. The 2000 review recognised that further work on cost causation should inform whether refinements to usage charges would be appropriate at subsequent periodic reviews. Three potential areas for improvement were specifically identified. These related to the extent to which charges should be differentiated according to:

- vehicle characteristics (following further research on the UK railway network);
- geographical disaggregation; and
- the level of track and vehicle maintenance.

Extending usage charges to include track/vehicle maintenance is not being considered further at this stage. Our priority has been to improve our knowledge of cost causation on the network through the ICM and our view is that incorporating an incentive mechanism relating to maintenance in the usage charge methodology would currently make the charging structure overly complicated in relation to the issues being faced. We are still considering maintenance issues in relation to the reform of Parts F and G of the Network Code.

Since the 2000 review the relationship between usage charges and capability issues has become more apparent. This document sets out our emerging views on this.

Objective

The usage charges are intended to reflect the Short-Run Marginal (Incremental) Costs of additional trains on the network. This is to ensure that:

- operators and rolling-stock manufacturers face signals to encourage the development of vehicles that will minimise whole-system costs over time;
- operators and funders face the right incentives in terms of optimising traffic across the network in the short term. For example, an operator will only run an additional train if the benefits are greater than the costs of doing so; and
- through the same means, Network Rail recovers the full cost associated with such traffic and hence is not dis-incentivised to facilitate marginal increases.

Currently, usage charges are paid by all operators on the network and are currently set on a per mile basis for each vehicle type, with the rates for each vehicle based on a formula reflecting weight, unsprung mass and unconstrained maximum speed (that is, unconstrained by the capability of the network). Separate calculations are made for structures and track.

ORR guidance

The overarching objectives for the Structure of Charges review apply and these are set out in section 2 above. In relation to usage charges the trade-off between cost-reflectivity and administrative ease is considered particularly relevant.

In its February 2007 Guidance document, ORR set out the following requirements:

You will need to provide a refined set of charges estimates, which reflect the amendments you propose to make to the cost assumptions included in ICM version 1.

You will need to set out how you have taken into account comments from ORR, and the results of further work including work conducted by others (for example, the reporters' conclusions on

variable cost estimation, the results of the TTCI work you commissioned impacting on the allocation of variable costs between freight and passenger, and the conclusions of work being commissioned by ORR on asset life assumptions and their impact on cost variability at low traffic levels).

Analysis and discussion of issues

Overview

As noted in the introduction the variable usage charges have been informed by the development of the ICM, TTCI consultancy work, and engagement with stakeholders. Full details of these outputs and how they can be accessed are included in the table at the end of this section.

The main steps we have completed in forming our proposal are:

- Identifying the costs to be recovered by variable charges.
- Recalculating the variable usage charge formulae, including:
 - reviewing the vertical forces calculations; and
 - incorporating a new tangential forces term to address issues such as rolling-contact fatigue.
- Analysing the benefits and costs of route-based charging.
- Understanding what level of capability is assumed in the setting of variable usage charges, and the circumstances under which unforeseen levels of usage may trigger changes in capability requiring modification of the charging arrangements.

Appendix 1 contains a flow-chart providing an alternate depiction of these steps and the links between them.

The remainder of this section describes how we completed each of these steps, and provides further information about the issues we resolved.

Costs to be recovered by variable charges

Our methodology involves running the ICM with changed assumptions about the level of usage around the forecast level. This provides an insight as to the nature of short-run marginal costs.

The network-wide cost of additional traffic is the sum of the changes in a number of individual cost categories. Some of these costs have a linear relationship with traffic (for example rectifying geometry deterioration) and other costs have more of a 'step-change' function (for example inspection costs). The intent of our cost modelling is to identify a reasonable increment where we can calculate a robust 'smoothed' relationship between traffic and costs.

Part of how we develop a smoothed relationship is by using long-term (25 year +) outcomes as part of the ICM modelling. This takes into account the lumpy nature of renewals – using a shorter time-frame would be misleading if a large renewal happened to be scheduled during the analysis timeframe.

A consequence of this approach is that variable charges recover costs associated with a given capability. We discuss this issue – along with our proposals to improve the capability definition by including a cumulative tonnage measure – in further detail at the end of this section.

For the purposes of calculating pence per mile charge, we must choose an appropriate 'increment' – that is, change in usage. The cost relationship is assessed over this usage band. As the purpose of the variable usage charge is to provide signals for decision-making at the margins while providing that Network Rail neither over- nor under-recovers, a 'smaller' rather than 'larger' increment makes sense.

Our choice of 5-10% as the appropriate increment is a judgement, reflecting changes in traffic:

- consistent with the short-run marginal costs (that is, not leading to a change in capability); and
- sufficiently large as to enable smoothing of the effects on the various individual cost components. Very small changes (in the limit, a single additional vehicle) would lead to changes in costs of those categories with a linear relationship, but may not trigger additional costs in those categories where the relationship is more of a step-change.

Furthermore, this increment is consistent with a reasonable confidence interval of the possible variation around forecast usage levels across the network as a whole.

Based on the traffic forecasts in this plan, we expect income from the new variable usage charges in 2009/10 to be £208 million for passenger services and £93 million for freight. These forecasts represent a reduction compared with the forecasts based on current charge rates of £240 million and £100 million respectively. The reduction for freight is less marked because current freight charges (set at the 2001 review) were based on a greater assumption for efficiency than those for passenger; freight was based on a 10-year efficiency assumption but passenger was only based on a 5-year efficiency assumption.

The figures presented in this plan assume no differential efficiency assumptions for freight and passenger (see below) and reflect results which imply an average rate of £1.81 per thousand gross tonne kilometres for passenger trains and £1.75 per thousand gross tonne kilometres for freight trains. The slightly higher rate for passenger trains reflects various factors including the relatively greater impact from the new term for tangential forces. The indicative charges for CP4 given above use the long term steady state cost projections at efficiency levels for the end of CP3.

There is some cost variation across the network. The following table shows £/thousand gtkm for each of five route categories.

Table 3 Cost by route category	
Route category	£/thousand gtkm
Primary	1.30
London & South-East	1.84
Secondary	3.04
Freight	2.58
Rural	6.44
<i>System-wide</i>	<i>1.79</i>

It is important to remember that the numbers presented in Table 3 represent the additional costs of additional traffic – not the **total** costs of a route. Further, while the per-unit cost of a rural route is in the order of three times the system average, the income to be recovered from rural routes is a small percentage of the total – in the order of 6.7%.

We are continuing to analyse the data, in particular considering the sensitivity of our results with different assumptions on the variability of usage around the forecast usage level.

Reviewing the vertical forces formulae

In conjunction with their work to develop a new term to account for tangential forces, we asked TTCI (UK) to review the formulae used for the impact of vertical forces on (separately) track and structures. The aim was to investigate whether:

- there are any obvious problems with the formulae that need to be corrected ahead of CP4 calculations;
- any improvements could be made for CP4, given the tight time-frames available; and
- in the longer-term there would be benefit in conducting a more comprehensive study to investigate the formulae. And if so, what this study would address.

TTCI (UK) reviewed the development of the formulae, compared the parameters against other reasonable comparators, and conducted sensitivity analysis around the impact of changing parameters.

TTCI (UK) was unable to identify any factual or logical errors in the development of the formulae.

They also concluded that there is no strong justification for amending any of the parameters now ahead of the CP4 calculations – notwithstanding the range in parameters observed in use by (for example) the International Union of Railways (UIC) Code and quoted by a recent study by Oberg & Anderson (June 2007). There is insufficient justification for amending the GB charging values despite the existence of potential alternatives. Further comfort is given by the GB parameters generally lying within a reasonable band of alternative values.

Notwithstanding this approach for CP4, the results are sensitive to choice of parameter and so there appears to be value in carrying out a more in-depth study during CP4 to inform the charging proposals for CP5. This is likely to be a major undertaking and would need to be fully scoped in the early part of CP4.

Including a Rail Surface Damage (RSD) term

Background & context

The existing usage charges formulae focus on the impacts of vertical forces. With the quantification in recent years of the importance of Rolling Contact Fatigue (RCF) there has been work to add a term to the formulae relating to tangential forces – i.e. those forces that operate along the surface of the rail.

During the 2005 ‘Structure of Costs and Charges’ Review, Booz Allen Hamilton were asked by ORR to develop a charging methodology to take account of the impact of RCF on the allocation of usage costs for the variable charging regime. As the same factors that influence RCF drive rail (side) wear and squats, it was decided that any new model for RCF should also allocate the costs associated with rail (side) wear and squats. Thus, the model developed by Booz Allen Hamilton was termed a Rail Surface Damage (RSD) model. The work focused primarily on the impact of passenger vehicles. In 2006 TTCI (UK) were asked to carry out additional work for the ORR on the effect of freight vehicles on rail surface damage.

As part of its responsibility for proposing charges, Network Rail has taken over sponsorship of this work, taking it through to the stage of firm proposals which would be capable of being billed.

Methodology & analysis

The key issues we have asked TTCI (UK) to address are:

- whether a new term can be added to reflect the costs of rail surface damage (rolling contact fatigue and wear); and
- whether route-based charging is practicable.

TTCI (UK) has concluded that the answer to both these questions is yes. It is worth noting on the second of these that the proposed methodology could equally be applied to a network-average approach. Route-based charging may be practicable but this does not necessarily mean desirable, and further analysis is required.

In terms of a methodology to incorporate a new term, TTCI's analysis suggests that RSD is a function of the tangential forces (T) and creepages (γ) between the wheel and the rail. This function depends on the curving performance of a vehicle and cannot be expressed as a simple relationship with vehicle properties, as can the function which describes vertical forces.

However, sufficient information and modelling results exist for Network Rail to publish a set of assumed $T\gamma$ tables for each vehicle type over a range of track curvatures and cant deficiencies. Train operators, train leasing companies, and vehicle manufacturers would have the opportunity to provide alternative tables; subject to independent technical audit. These tables would be calculated for each type of vehicle.

Key features of the methodology are that it:

- combines the surface cracking and wear produced by a vehicle;
- treats vehicles independently from one another;
- considers the steady-state curving performance of the vehicle; and
- accounts for the beneficial effects of grinding on rail life.

Development of the methodology has benefited from discussion and input from key stakeholders, including the various industry technical advisory groups and industry associations.

The methodology requires details of vehicles' suspensions and operating characteristics. Where these are not available, calculations would be made on assumed values, with interested parties submitting their own calculations afterwards if they wish to do so. The process for this would need to take place under the auspices of an independent auditor – which could protect any intellectual property while verifying the analytical approach.

Full details of the analysis underlying these conclusions are provided in the TTCI (UK) reports (see table at the end of this section for report locations and accessibility). The report conclusions address comments and concerns raised by a range of stakeholders, draw on extensive sensitivity analyses, and reflect the latest understanding of wheel-rail dynamic forces. Notwithstanding this, a number of technical judgements and simplifying assumptions have been necessary to overcome data limitations and ensure that the result is computationally practical. The key judgements – and the underlying rationale – are set out in the following table.

Table 4 Methodological approach – Rail Surface Damage term		
Issue	Issue / description	Approach taken...
Route curvature	The RSD term is driven by the curvature of the network and the curving capability of the rolling-stock. Some summary way of capturing the network curvature is needed so that the calculations are not excessively complex.	ICM curvature data classified by bands of 300m radii. Ultimate source of the data is the New Measurement Train. We assume that any unmapped parts of the network has a curvature distribution equivalent.

Issue	Issue / description	Approach taken...
Curving class	The summary means of describing the curving capability of vehicles.	We have allocated all rolling-stock operating on the network to one of 40 curving classes. The information fed into the modelling process covers vehicle mass and primary yaw stiffness.
Cant deficiency	Also a factor in the forces generated when curving, as it reflects the nature of the vehicle and cornering speed.	Passenger vehicles assumed to operate with a cant deficiency of 40mm. Freight vehicles limited to 45 miles/hr are assumed to operate at balance speed, and all other freight vehicles assumed to operate at 20mm cant excess. These were drawn from an analysis of the distribution of cant across Network Rail infrastructure.
Rail profile	A factor in the modelling and forces produced.	Measured semi-worn rail profiles are used for each of four curvature ranges (<750m, 751 to 1500m, 1501 to 3000m, >3000m).
Rail lubrication	Influences the coefficient of friction used in the T-γ modelling.	Assume that all curves with radius less than or equal to 1500m to have the gauge face of the high rail lubricated. Therefore, the coefficient of friction is assumed to be 0.4 at all contact points except the gauge face of the high rail where it is assumed to be 0.2.
Wheel profile	Important parameter in capturing the interaction between wheel and rail.	Measured semi-worn wheel profiles used. For passenger this is assumed to be a worn P8, and for freight a worn P5.

Results

Key points to note from applying the revised methodology include the following:

- Freight vehicles will tend to face lower charges using the new methodology as compared to a methodology focusing solely on vertical costs.
- The methodology that TTCI (UK) has developed can be easily applied to any new vehicles that might operate across the network in the future. An independent audit process may need to be used to protect commercially sensitive information about vehicle characteristics, while ensuring that the results are robust.
- The methodology can be applied to either a network-wide or route-based approach.
- Further consideration needs to be given as to how this methodology would be applied to new vehicles and we will work with ORR and the industry to develop this.

Consideration of route-based charging

In principle, route-based charging can provide more accurate signals to operators, funders and rail industry suppliers, and consequently improve the use and development of the network. In practice, this relates to the critical issue of minimising whole-system costs.

The ultimate decision is based on a combination of the:

- inherent cost variability across the different routes – this effectively forms an initial hurdle; and
- consequent benefits and costs of the new charging mechanism.

Cost variability

Table 3 above shows that there are material differences between route categories across the network.

Costs of introducing route-based charging

The costs to Network Rail of introducing route-based charging include the following:

- There will be some additional ongoing administration to produce, collate and interpret additional charges but this is likely to be small as the systems are fully automated.
- Work is underway to deliver a new billing system. The specification includes the ability to bill on a route-basis. Any additional costs are therefore likely to be marginal.

However, there are also the costs to industry from greater administration, additional complexity, and potentially flow-through business impacts. We are keen to understand the likely implications in more detail and look for stakeholder feedback on this matter.

We are also concerned about the potential for route-based charging to introduce perverse incentives. For example, by encouraging traffic to switch toward parts of the network that are most congested.

Benefits of introducing route-based charging

The benefits depend on the extent to which route-based charging can be expected to 'optimise' the behaviour of the various stakeholders – Network Rail, DfT / TS / other funders, franchised TOCs, passenger open-access operators, FOCs, and rail industry suppliers. It is very difficult to quantify.

The main benefit is likely to be the development of rolling-stock that takes into account the specific route-characteristics over which it will run. In order to minimise whole-system costs, it is a fundamental principle of vehicle design that different route characteristics – speed, track quality, curvature, etc – demand different vehicle characteristics. The likely impact of route-based charging on improving whole-system optimisation depends on the extent to which differential charges provide a business case for alternate rolling stock development.

The other area of potential benefit is via the signals to funders and operators in terms of franchise specification and decisions to operate additional trains.

Choice of 'route-based'

We have described some of the generic categories of costs and benefits associated with route-based charging. The choice of route definitions would be crucial in determining the actual benefits and costs that would arise. The choice of route definitions would have to balance the need to capture meaningful distinctions in operating requirements between the routes, against avoiding excessive complexity that would generate administrative effort (without offsetting benefit).

The following table presents some average charges based on three possible choices of route:

- Network average as is currently used.
- Combination of route and curvature categories. There are an infinite number of variations that could be adopted here – based on the principle that route category and curvature are key cost drivers. For the sake of providing indicative charges and to provide a flavour of the key outcomes, we have identified five routes and three curvature categories. Each SRS is allocated to one of the fifteen individual categories.

However, where the track km within the category is very small we believe that there is the potential for the results to be biased by outliers so we have not identified separate charges for such categories.

- System-wide with three curvature categories. This reinforces the signals set up by introducing a tangential forces term for variable usage charges – tangential forces increase with tighter track curvature.

The following table summarises the indicative results according to these route categorisations. The patterns for a given vehicle follow those established in the table – curvy is generally more expensive than mixed than straight; and rural is most expensive and primary the least.

	<i>All curvature</i>	Straight	Mixed	Curvy
System-wide	1.79	1.48	2.24	3.20
Primary	1.30	1.10	2.12	
L&SE	1.84	1.61	2.29	
Secondary	3.04	2.88	3.00	6.19
Freight	2.58	1.81	3.13	
Rural	6.44	5.27	6.63	9.58

Comparisons between vehicles are more complicated, and reflect the many factors relating to vertical and tangential forces that influence the price. For the purposes of illustration, we provide indicative per-vehicle charges on a system-wide basis in Appendix 2.

Next steps

We still have reservations about the merits of adopting route-based charging. However, we are continuing to analyse the data and to better understand the implications of route-based charging. We are keen to understand stakeholder views, particularly in relation to:

- The practical benefits and costs of route-based charging in general.
- The benefits and costs of the indicative approaches presented here.
- Whether alternate route-specifications may be more appropriate.

Variable electrification asset charge

Context and issue

In CP3 the variable costs relating to electrification assets were recovered via an 0.89 pence mark-up (in 2001/02 prices) per kilowatt hour. Given that electricity consumption is not the driver of costs, this is not reflective of wear and tear on electrification assets, and in CP4 we are therefore proposing to recover these costs via a separate variable charge. This paper outlines the derivation of the costs and options for the nature of the variable charge.

The challenge is the same for other variable usage charges – recover the variable costs in a cost-reflective manner without introducing excessive complexity.

Variable electrification asset costs

We have calculated the costs to be recovered through the variable electrification charges as being £9m per annum. This is built up as follows:

- *OLE renewals.* Our SBP (chapter 6) shows £63m spend over 5 years of CP4 (an average of £12.6/year) for overhead wires. We have assessed that 50% of the OLE renewal activity is affected by traffic (wear and tear from pantograph) and that 80% of the cost of that activity varies. Hence OLE renewal variable cost is £5m/year. In contrast with the ORR's approach at the last review, we have focussed on the overhead wires and do not believe that any of the AC distribution renewals or switchgear renewal is variable. We believe that AC distribution and switchgear is not affected by traffic but it is affected by natural degradation such as weather and ageing.
- *Conductor rail renewal.* We forecast £5 million/year for renewal of conductor rail. We do not believe any of the DC distribution renewal costs are variable with traffic. We have assessed that 50% of the conductor rail renewal activity is affected by traffic (wear and tear from pick-up shoes) and that 80% of the cost of that activity varies. Hence conductor rail renewal variable cost is £2m/year.
- *Electrification maintenance.* SBP chapter 6 shows total maintenance on electrification and plant is £236m over CP4 and, with more than half relating to OLE, and the largest element within this being for inspections. We have assumed that 50% of E&P maintenance relates to OLE, which gives £23m/year. In our view 10% of this activity varies with traffic. This is consistent with the assumption made in the 1999 Booz Allen and Hamilton report on infrastructure cost causation that was used by ORR when setting charges at the 2000 Periodic Review. Hence OLE maintenance variable cost is £2.3m/year.

This is significantly lower than the approximately £30 million per annum that we currently collect from the EC4T mark-up. The reduction reflects the differences in assumptions we have made around the variability of certain cost categories as described above.

Options analysis

The first choice is between a percentage mark-up on the variable usage charges or a per-unit rate. The percentage mark-up approach would not achieve the goal of cost-reflectivity as the factors driving variable usage charges (vertical and tangential forces on track and structures) are unlikely to be proportional to the causes of wear and tear on electrification assets. Therefore, a per-unit rate is preferable.

There are a number of complexities about variable cost causation that makes it difficult to identify a simple per-unit measure. For this reason we set out a number of options and invite stakeholder input to help us identify the best approach.

Consultancy advice to ORR³ suggests that variable costs are driven by the force on the asset – this is influenced by factors such as speed, the type of pantograph, and the extent to which the overhead line has to lose height for bridges and other route features. There are further complications when a train has more than one pantograph – there are multiplicative rather than additive impacts.

We have identified the following 4 options:

- *Pence per electrified vehicle-km* – this would be applied on a network average basis and would take into account the existence of multiple pantographs as an 8 car consist (i.e. 2 x 4 cars) with 2 pantographs would have twice the vehicle km as a 4 car consist.
- *Pence per electrified train-km* – this would be simpler than a vehicle-km basis but would not take into account multiple pantographs and is not necessarily a proxy for speed.

³ Booz | Allen | Hamilton & TCI (January 2005) *ORR Revision of Variable Usage and Electrification Asset Usage Charges: Initial Report*. Accessed at: http://www.rail-reg.gov.uk/upload/pdf/bah_variable-usage-initial-report_jan05.pdf

- *Differential charges based on speed* – we could choose (say) three speed bands and choose pence per km (it could be train or vehicle) rates reflecting the relative differences between the forces generated at different speeds. This could be complicated and would require a clear view of the relative differentials to be applied.
- *Route-based rates* – this might be a proxy for speed and other factors such as vertical movement within the overhead line. However, it is likely to be very complex to devise and to bill, and there is no guarantee that it would be a useful proxy.

As an overlay to these options we will also need to decide whether the charges should be a network-wide average or separated into overhead-line and third-rail specific charges.

Questions for stakeholders

The choice of option depends on a number of factors including:

- The extent to which additional complexity generates greater industry administrative costs as compared to improved cost-reflectivity.
- The certainty around which we can model the forces and cost causation – particularly in terms of the differences between:
 - forces on overhead line assets and third rail;
 - significance of speed versus multiple pantographs versus route features; and
 - degree to which forces are an accurate proxy for the cause of electrification asset wear and tear.
- The variation in the types of pantographs in use across the network and the differential impact of these on asset wear and tear.
- Likely materiality of the charges.

We would welcome feedback from stakeholders on these issues and/or any other relevant material.

Treatment of capability

As discussed above, the relevant measure of incremental costs aims to take the capability of the network as given. This raises questions around the assumed level of capability, as well as the associated question of how to treat changes in usage that trigger changes in capability.

The focus of this section is on the provision of capability across the network for freight – what capability is included in the charges, and related, what happens to charges when capability varies over time? We believe this is the most likely application of this particular issue.

The treatment of capability stems from the principles of charging. In this respect, the economic arguments for not setting charges based on full avoidable costs relate to:

- (lack of) ability of the market to bear a contribution to the full fixed costs; and
- incentives for optimal behaviour at the margin.

An implication of adopting these principles is that charges will not cover the cost of increasing or sustaining capability over the long term, in particular when:

- incremental traffic necessitates an increase in capability; and
- major renewals may make it uneconomic to sustain existing capability.

The remainder of this section addresses the application of these principles in two areas:

- incremental traffic representing a step-change in tonnage capability; and
- how to treat major renewals so as to maximise efficient use of the network.

Incremental traffic

As part of Network Rail's ongoing Infrastructure Capability Programme a definition is being developed of total tonnage capability across a route. The contractual and funding considerations where incremental traffic on the network implies a step-change in activity required due to overall tonnage on a route also need to be considered. By incremental traffic we mean over and above that which is forecast – and hence that on which our cost estimates are based.

In our analysis to-date, Network Rail has set out three possible options:

- No change to the current situation of uncapped tonnage limits on a route. The implication of this is that Network Rail may be required to immediately deliver any level of additional traffic. Issues are that this approach is:
 - impractical;
 - a poor use of scarce industry resources; and
 - inconsistent with charging based on marginal costs.
- New contractual provisions obliging customers to provide advance notice of relevant increases in tonnage, and linkages to advanced planning. This would trigger an appraisal of the case for enhancing capability with freight operators to determine whether requirements should be accommodated. Some of the issues include:
 - efficient in respect of planning and resource utilisation;
 - consistent with charging based on marginal costs only; and
 - Network Rail would need to be funded for any net impact on OM&R above that already funded by the variable track usage charge.
- Tonnage limit operating constraint where route tonnage limits would be established and would form an explicit ceiling to the operation across the route. Under this scenario incremental traffic would trigger the enhancement process. Issues with this are:
 - efficient in respect of planning and resource utilisation; and
 - market may not be able to bear additional costs.

Our favoured approach is the second approach (i.e. to implement new contractual provisions for efficient planning and facilitation of additional traffic). If the appraisal confirms the case for enhancing capability then Network Rail would finance this in the short term, with a RAB addition (or rolling RAB adjustment) where appropriate for any net additional costs in the longer term. We are investigating how widespread this would be in practice but our current view is that this mechanism is unlikely to be invoked in many instances.

Major renewal

The charges set by Network Rail collect the smoothed out renewals profile. The forecast charges reflect our best idea of future renewals activity. It is important that Network Rail be incentivised to act in a whole-industry optimising way. For this reason the renewals profile should evolve over time to reflect changes in network demands.

This is particularly the case for a major renewal which, if undertaken, will have major implications for the ongoing stream of charges, including that this may make it uneconomic to sustain the existing capacity. The point at which a major renewal is to be undertaken represents an important opportunity to evaluate what is in the best interests of the freight industry going forward as this may change over time.

There is clear support for continuing to sustain freight capability over the network into the long-term. We clearly share this view. There are two possible interpretations of what this might mean however:

- sustain freight capability of existing routes in the long-term; or

- sustain freight capability across the network over the long-term.

We are concerned that the first of these approaches:

- will decrease value for money of freight industry;
- will leave sensible freight enhancements unfunded;
- will restrict the ability to respond to changing market circumstances over time; and
- is inconsistent with charging based on marginal costs only.

We therefore support the second approach.

Sustaining freight capability across the network

Instead of automatically preserving the existing capability in a location-specific manner, at the time of a major renewal, consideration would be given as to whether it is economically sensible to renew or whether instead there should be enhancement of freight capability elsewhere on the network.

Any short term savings from such rationalisation would be ring-fenced for freight enhancements so that over the network as a whole, capability would be sustained over the long-term.

There are two possible options as to how this would be operationalised in practice:

- An obligation on operators to discuss requirements at the time of major renewal and appraisal with operators to determine whether the major renewal should go ahead. In this case the decision would be based on reaching a consensus agreement, there would be no mechanism to force this decision.
- Regulatory mechanism to allow compulsory adjustment of access rights where major renewal makes it uneconomic to sustain existing capability on the particular route in question.

Network Rail currently favours the first of these, given operators already face a certain level of incentives in relation to supporting Network Rail to make effective use of scarce industry resources.

4 Freight-only charge

Introduction

This section describes our proposals to implement the ORR decision to introduce a new charge for freight-only lines.

The current structure of freight track access charges was established by the 2001 freight charges review⁴. Under these arrangements freight operators pay a range of variable charges but do not currently contribute to fixed costs (costs that do not vary with traffic) or common (shared) costs. The Government currently pays freight operators' contributions to these costs as part of the network grant it pays to Network Rail.

The proposed new charge reflects the Government's statement in the Future of Rail White Paper⁵ that: "Where lines carry only freight, and no passenger services, the freight operators will pay its full costs". To be consistent with relevant legislation, the costs of freight-only lines can only be charged where the freight market can bear this cost. In its Advice to Ministers⁶, ORR concluded that only two market segments had the ability to bear the fixed costs of freight-only lines, coal for the electricity supply industry (ESI coal) and spent nuclear fuel.

Definition of Freight-Only Lines

The ORR consultation document on freight charges⁷ set out a definition of freight-only lines. This was discussed and confirmed at industry meetings earlier this year, such that the definition for the purposes of charging is as follows.

A freight-only line is one that:

- would close if freight services ceased to operate;
- includes segments of branches used only by freight traffic; and
- is a terminal line.

Freight-only lines do not include:

- through lines, as these provide operational benefits for the mixed-use network;
- freight-only sections that are used for passenger diversionary traffic or empty coaching stock on a normal basis;
- branch lines on which Network Rail infrastructure services operate;
- freight-only lines on which there is a realistic prospect of extensive passenger services;
- goods/slow lines that run parallel to passenger lines; and
- lines where franchised passenger services have access rights regardless of how frequently they are used.

⁴ Review of freight charging policy: final conclusions, Office of the Rail Regulator, October 2001

⁵ The Future of Rail CM6233, July 2004, Department for Transport

⁶ Advice to Ministers and framework for setting access charges, Office of Rail Regulation, February 2007

⁷ Consultation on caps for freight track access charges, Office of Rail Regulation, December 2006

Table 6 List of Freight-Only Lines for Proposed New ESI Coal Charge and Nuclear Fuel Charges

Name	ELR	From mileage	To mileage	Track miles	Track KM	Route Miles	Route KM	Number of tracks	Territory	Baker Ref	Quail ref
<u>ESI Coal</u>											
Ayr Harbour to Newton Jn	AYH1	0.81	0.05	0.76	1.22	0.76	1.22	1	SCO	77	Scotland 3
Boldon Colliery Jn – Green Lane	BGE	0.03	0.65	0.63	1.01	0.63	1.01	1	LNE	76	Eastern 49A
Immingham to Ulceby	BRI2	100.54	104.08	7.08	11.39	3.54	5.70	2	LNE	63	Eastern 32B
Bedlington Nth L.C. to West Sleekburn Jn	BWC	0.00	0.72	1.45	2.33	0.72	1.16	2	LNE	74	Eastern 23C
West Sleekburn Jn to North Blyth Alcan	BWC	0.72	2.71	3.98	6.40	1.99	3.20	2	LNE	74	Eastern 23C
Ashington Jn to Lynemouth Alcan	BWC	2.71	4.13	2.83	4.55	1.41	2.27	2	LNE	74	Eastern 23C
Ashington Jn to Butterwell Jn	BWO2	0.00	3.06	0.09	0.15	0.09	0.15	1	LNE	74	Eastern 22B/23C
Drax National Power to Drax Branch Jn	DRA1	0.00	4.20	8.40	13.52	4.20	6.76	2	LNE	62	Eastern 40B
East Usk	EUB	0.00	1.18	1.84	2.96	1.84	2.96	1	WES	32	Western 21A
Green Lane – Tyne Dock	GLT	0.65	1.54	0.89	1.43	0.89	1.43	1	LNE	76	Eastern 49A
Harworth Colliery	HAC	11.25	14.68	3.43	5.52	3.43	5.52	1	LNE	53	Eastern 35A
Shirebrook East Jn – Thoresby Colliery	HIM	9.90	17.26	7.29	11.73	7.29	11.73	1	LNE	53	Eastern 30A/B
Hessle East Jn to Hull Saltend BP	HJS	0.00	5.79	5.79	9.31	5.79	9.31	1	LNE	63	Eastern 38C
Annbank to Killoch	KCH1	43.65	48.91	5.26	8.47	5.26	8.47	1	SCO	77	Scotland 3
Bank Jn to Greenburn	KSH	54.04	55.00	0.96	1.55	0.96	1.55	1	SCO	71	Scotland 2E
Portobello Jn to Leith South Goods	LHS1	0.00	2.76	2.76	4.44	2.76	4.44	1	SCO	79	Scotland 11A
Madeley Jn to Ironbridge	MJI1	156.24	160.19	6.22	10.01	6.22	10.01	1	LNW	41	Mids&NW 21C/D

Table 6 List of Freight-Only Lines for Proposed New ESI Coal Charge and Nuclear Fuel Charges

Name	ELR	From mileage	To mileage	Track miles	Track KM	Route Miles	Route KM	Number of tracks	Territory	Baker Ref	Quail ref
Garston – Speke	SCR	22.74	24.39	1.65	2.66	1.65	2.66	1	LNW	59	Mids&NW 38A/40
Bootle Junction to Seaforth	SCT1	5.00	7.15	2.15	3.46	2.15	3.46	1	LNW	59	Mids&NW 40/41A
Cottam Powergen to Clarbrough Jn	TYB1	68.39	71.99	7.19	11.56	3.59	5.78	2	LNE	54	Eastern 31B
Tower to Aberdare	VON	22.46	27.24	4.77	7.68	4.77	7.68	1	WES	31	Western 29A
Onllwyn & Cwmgwrach Ryans	VON	33.16	46.76	15.69	25.25	15.69	25.25	1	WES	31/32	Western 24A/B
Dalrymple to Chalmerston	WAT	43.66	52.87	9.21	14.81	9.21	14.81	1	SCO	70	Scotland 2C
Welbeck Colliery Jn – Welbeck Colliery	WKC	0.00	2.79	2.79	4.49	2.79	4.49	1	LNE	53	Eastern 30A
					165.91						
<u>Spent Nuclear fuel</u>											
Appledore to Dungeness	APL	64.73	74.05	9.32	15.00	9.32	15.00	1	SEA	13	Southern 18D
Sizewell Sidings	SIZ	91.50	95.19	3.68	5.93	3.68	5.93	1	SEA	46	Eastern 8/9A
Seaton On Tees	SOT	0.00	1.33	1.33	2.13	1.33	2.13	1	LNE	68	Eastern 48A
					23.06						

Table 7 Cost Estimates for Freight-only Lines for Proposed New ESI Coal and Spent Nuclear Fuel Charge

Name	Track KM	Attributed cost of line per annum from ICM (£m)	Related cost of line per annum from ICM (£m)	Total annual cost of line from ICM (£m)	Total traffic 000s gross tonne km (2006/07)	ESI coal traffic 000s gross tonne km (2006/07)	Spent nuclear fuel traffic 000s gross tonne km (2006/07)	Proportion of Total cost for ESI or Nuclear (£m)	Variable unit cost (£ per 1000 gross tonne km)	Variable cost (£m)	Cost to be recovered from new charge (£m)
ESI Coal											
Ayr Harbour to Newton Jn	1.22	0.050	0.021	0.071	6,712	6,390		0.068	1.75	0.011	0.056
Boldon Colliery Jn – Green Lane	1.01	0.041	0.017	0.058	5,960	4,750		0.046	1.75	0.008	0.038
Immingham to Ulceby	11.39	0.450	0.114	0.564	465,109	195,827		0.237	1.75	0.343	0.000
Bedlington Nth L.C. to West Sleekburn Jn	2.33	0.081	0.067	0.148	2,274	1,068		0.070	1.75	0.002	0.068
West Sleekburn Jn to North Blyth Alcan	6.40	0.224	0.185	0.409	3,013	2,303		0.313	1.75	0.004	0.309
Ashington Jn to Lynemouth Alcan	4.55	0.159	0.132	0.291	4,228	590		0.041	1.75	0.001	0.040
Ashington Jn to Butterwell Jn	0.15	0.005	0.004	0.009	55	50		0.008	1.75	0.000	0.008
Drax National Power to Drax Branch Jn	13.52	0.706	0.216	0.922	166,130	145,865		0.810	1.75	0.255	0.554
East Usk	2.96	0.121	0.050	0.171	2,172	2,093		0.165	1.75	0.004	0.161
Green Lane – Tyne Dock	1.43	0.059	0.024	0.083	8,400	6,700		0.066	1.75	0.012	0.054
Harworth Colliery	5.52	0.263	0.089	0.352	4,556	4,555		0.352	1.75	0.008	0.344
Shirebrook East Jn – Thoresby Colliery	11.73	0.328	0.078	0.406	5,526	5,508		0.405	1.75	0.010	0.395
Hessle East Jn to Hull Saltend BP	9.31	0.435	0.095	0.530	47,260	45,271		0.508	1.75	0.079	0.428
Annbank to Killoch	8.47	0.483	0.324	0.807	17,598	17,570		0.806	1.75	0.031	0.775
Bank Jn to Greenburn	1.55	0.088	0.059	0.147	2,030	2,030		0.147	1.75	0.004	0.143

Table 7 Cost Estimates for Freight-only Lines for Proposed New ESI Coal and Spent Nuclear Fuel Charge

Name	Track KM	Attributed cost of line per annum from ICM (£m)	Related cost of line per annum from ICM (£m)	Total annual cost of line from ICM (£m)	Total traffic 000s gross tonne km (2006/07)	ESI coal traffic 000s gross tonne km (2006/07)	Spent nuclear fuel traffic 000s gross tonne km (2006/07)	Proportion of Total cost for ESI or Nuclear (£m)	Variable unit cost (£ per 1000 gross tonne km)	Variable cost (£m)	Cost to be recovered from new charge (£m)
Portobello Jn to Leith South Goods	4.44	0.220	0.103	0.323	13,752	13,683		0.321	1.75	0.024	0.297
Madeley Jn to Ironbridge	10.01	0.363	0.063	0.426	26,040	25,478		0.417	1.75	0.045	0.372
Garston – Speke	2.66	0.109	0.045	0.154	7,529	663		0.014	1.75	0.001	0.012
Bootle Junction to Seaforth	3.46	0.141	0.048	0.189	55,411	43,490		0.148	1.75	0.076	0.072
Cottam Powergen to Clarborough Jn	11.56	0.457	0.116	0.573	53,580	49,987		0.535	1.75	0.087	0.447
Tower to Aberdare	7.68	0.300	0.043	0.343	5,615	5,467		0.334	1.75	0.010	0.324
Onllwyn & Cwmgwrach Ryans	25.25	0.668	0.182	0.850	27,754	20,084		0.615	1.75	0.035	0.580
Dalrymple to Chalmerston	14.81	0.845	0.567	1.412	19,411	19,403		1.411	1.75	0.034	1.377
Welbeck Colliery Jn – Welbeck Colliery	4.49	0.125	0.030	0.155	10,190	10,186		0.155	1.75	0.018	0.137
	165.91	6.721	2.672	9.393				7.990		1.101	6.994
<u>Spent Nuclear Fuel</u>											
Appledore to Dungeness	15.00	0.522	0.122	0.644	710		669	0.607	1.75	0.001	0.606
Sizewell Sidings	5.93	0.199	0.000	0.199	150		147	0.195	1.75	0.000	0.195
Seaton On Tees	2.13	0.083	0.024	0.107	41		41	0.106	1.75	0.000	0.106
	23.06	0.804	0.146	0.950				0.908		0.001	0.907

Structure of charges

List of Freight-Only Lines for the new charge

The process we have followed to establish a list of freight-only lines applicable for the new charge has involved several stages. In February we published an initial list of freight-only lines⁸ on our website and in early August published a revised list⁹, this time containing data on commodity traffic. We received useful feedback on both lists and used it to refine the list accordingly. As the new charge is intended to be levied only on lines carrying ESI coal or spent nuclear fuel we then revised the list further to remove all lines not used for these two commodities or with no traffic for these two commodities in 2006/07. The original register included a few lines that were covered by connection agreements where Network Rail receives separate income. Clearly these sections should not be subject to the new charge and so we reviewed the list of freight-only lines carrying ESI coal and spent nuclear fuel to remove any sections where separate income was received. The overall effect of these reviews and iterations resulted in the list shown in Table 6. There are 24 freight-only lines that carry ESI coal and 3 that carry spent nuclear fuel with a total length of track of 166km and 23km respectively.

Costing

The flow chart shown in Appendix 1 sets out the steps we have followed to assess the costs of freight-only lines for charging purposes. The remainder of this section provides more detail on each step.

Earlier in the year we prepared an initial cost estimate for freight-only lines¹⁰. At that time we costed all terminal freight-only lines (585 track km) at £36m. Since then ORR concluded that only ESI coal and nuclear lines should be levied the new charge and so, as described above, the list has significantly reduced. We have also updated our cost estimates using the latest ICM information and methodology described in our paper in the summer¹¹. Our latest estimate builds up the cost for each line using the ICM data and gives an estimate of £9.4m for ESI coal and £0.95m for nuclear.

However, there are two adjustments to these costs that must be made to assess an appropriate figure for charging purposes. Firstly, many of the freight-only lines carry other commodities, not solely ESI coal or nuclear, and so the chargeable cost should be adjusted to reflect this. Secondly, our cost estimates represent the total cost of freight-only lines and so to assess the proportion of fixed costs an adjustment must be made to deduct the variable costs on the line. Each of these adjustments is considered in turn below.

Adjustment for other commodities

Many of the freight-only lines carry other commodities as well as ESI coal or spent nuclear fuel and so we propose a reduction in the cost estimates to reflect this. We believe that the most appropriate way of doing this is in proportion to the volume of ESI coal or nuclear traffic compared to the total traffic on the line. We have considered different metrics to do this (gross tonne kms and train kms) but found that the resulting proportions for ESI coal and nuclear were not particularly sensitive to the method chosen. We have decided to use gross tonne kms for the figures presented in this SBP as we believe that this gives the best measure of the capability of the line and hence is most relevant in assessing the split of fixed costs. Table 7 shows the list of freight-only lines along with 2006/07 traffic data in gross tonne kms for ESI coal, spent nuclear and the

⁸ Register of freight-only lines, Network Rail, February 2007

⁹ Freight-only line register with traffic, Network Rail, August 2007

¹⁰ Infrastructure costs for freight, Network Rail, February 2007

¹¹ Freight costs and charges update, Network Rail, June 2007

total for all commodities. It also shows the resulting proportion of the total freight-only line cost that applies to the two commodities that ORR concluded should be chargeable. This adjustment reduces the cost to £7.99m for ESI coal and £0.91m for spent nuclear fuel.

Adjustment for variable costs

The cost estimates described above represent the total annual cost of renewing and maintaining the relevant freight-only lines. However, we will recover variable costs through variable charges and so this amount must be deducted to give the fixed costs to be recovered through the new charge. To make this adjustment we have used the average freight variable cost of £1.75 per 1000 gross tonne km derived from our ICM, the TTCI work relating to freight vehicle characteristics and the traffic data for 2006/07 to estimate the total variable income from each line. This is then deducted from the cost in the previous step as shown in Table 7. The resulting cost of £6.99m for ESI coal lines and £0.91m for spent nuclear fuel lines is our estimate of the cost to be recovered from the new charge.

Charging

The ORR set out various options for recovering the costs of freight-only lines through new charges in its consultation paper in the summer¹², namely: a fixed charge on each line; a variable charge applied only to traffic on freight-only lines and a variable charge applied across the network as a whole. ORR stated that it considered the third option of a mark-up on variable charges for ESI coal and spent nuclear fuel to be the most appropriate as it would be simple and easy to introduce. ORR also concluded that a network-wide mark up would avoid some of the problems of the other options (administratively complex and bureaucratic and likely to lead to disputes between operators and Network Rail). ORR confirmed these decisions in its recent conclusions letter¹³ and we have therefore based the indicative figures on charges shown in this SBP on that basis.

Based on 2006/07 ESI coal traffic of 16 billion gross tonne km and an overall variable cost of £1.75 per 1000 gross tonne km gives a variable cost for ESI coal of £28m per annum. The new fixed charge to be recovered is £6.99m as mentioned above which represents a mark up of £0.437 per 1000 gross tonne km.

Similarly for spent nuclear fuel, the 2006/07 traffic of 0.25 billion gross tonne km and an overall variable cost of £1.75 per 1000 gross tonne km gives a total variable cost of £0.44m per annum. The new fixed charge to be recovered is £0.91m as mentioned above which represents a mark up of £3.62 per 1000 gross tonne km.

However, in its Advice to Ministers, ORR set annual caps for the new ESI coal and spent nuclear fuel charges. Although the caps at the end of the control period are higher than the costs to be recovered, the caps for earlier years will impact on the amount charged. The ORR caps are set out in Table 8 and the impact of these caps on the new charge is set out in Table 9.

¹² Charge to recover the costs of freight-only lines, Office of Rail Regulation, 22 June 2007

¹³ Charge to recover the costs of freight-only lines, Office of Rail Regulation, 15 October 2007

Table 8 Caps set by ORR for the new Freight-Only Line charges

£m at 05/06 prices	2009/10	2010/11	2011/12	2012/13	2013/14
Cap on ESI coal freight-only line charge	2.8	5.6	8.4	11.2	13.9
Cap on spent nuclear fuel freight-only charge	0.3	0.6	0.8	1.1	1.4

Table 9 Impact of caps on new charge

	2009/10	2010/11	2011/12	2012/13	2013/14
<u>ESI Coal</u>					
ESI Coal Cap as proportion of cost to be recovered (£6.99m)	40%	80%	≥100%	≥100%	≥100%
ESI Coal mark up in £ per 1000 gross tonne km	0.175	0.350	0.437	0.437	0.437
<u>Spent Nuclear Fuel</u>					
Nuclear Cap as proportion of cost to be recovered (£0.91m)	33%	66%	88%	≥100%	≥100%
Nuclear mark up in £ per 1000 gross tonne km	1.195	2.389	3.186	3.620	3.620

5 Coal Spillage Charge

Introduction

This section discusses the current coal dust spillage charge and considers options for continuing with it or developing a revised charge or revised cost recovery arrangement for CP4. In August this year we published a consultation paper on the charge¹⁴. The paper described the current charge (a mark up on wagons carrying coal), the problems caused by coal spillage (points failures, track circuit failures, reduced life of points, rail and ballast) and options for revisions to the charge.

Consultation Responses

Most of the respondents said that they wanted to see more work to assess the potential cost impact of coal spillage on the network. The current charge (about £5m per year) was set by ORR in the 2001 freight charging review and was based on a top down assessment from consultants. We agree that more analysis is needed and have collected some data on the impact of coal spillage on points and the cost impact of reduced ballast life. The following section describes the cost data we have collected so far.

Some respondents commented that the charge should only be levied on certain types of wagon. However, our study indicates that the method of loading coal is more important than the type of wagon. Where coal is spilled onto the edges, sides or couplings of wagons when being loaded then this coal tends to fall off on route, however, where coal is loaded in a more controlled manner then the subsequent level of spillage is reduced. Similar problems occur following the emptying of wagons when the discharged coal has been allowed to build up as the wagons pass over the discharge hoppers and the under-frames and running gear are not cleared before the train leaves the discharge point.

Some respondents felt that the current charge should be scrapped altogether, but others agreed with us that some form of incentive arrangement should be introduced to reward customers and operators who act to reduce spillage.

Cost Implications

Since August we have collected some useful information on points failures caused by coal spillage and used this to quantify the spillage problem and estimate the cost impact. In 2006/07 there were 240 points failures due to coal spillage on the part of the network covered by four of our management areas (East Midlands, Great Northern, North Eastern in LNE and West Midlands in LNW). We have estimated the cost impact on our OM&R costs associated with points as follows:

1. We have assumed that a typical 35 year asset life for a set of points is reduced by 25% when affected by coal spillage. Based on a unit renewal cost of £500,000 this results in an increased annual depreciation cost of £4,944 per set of points affected
2. The cost to clear up the coal spillage to remedy each points failure is estimated to cost £2,400 per incident
3. There were 6825 delay minutes associated with the 240 point failures caused by coal spillage in 2006/07. We have assumed a typical payment rate of £8 per minute for these delays
4. The 4 areas carry about 57% of all coal traffic and so to estimate a total for the network as a whole we have simply pro-rated the costs up. This gives a network-wide cost impact on points of £3.2m per annum.

Coal spillage also impacts on our costs through reduced asset life for ballast (becomes blocked by coal dust) and rail (corrosion due to sulphur content and moisture retention),

¹⁴ Coal spillage charge, Network Rail, August 2007

and through track circuit failures (wet coal slurry shorting out the rails). Of these the most significant is the shortened ballast life and we have estimated the cost impact of this as follows:

1. We estimate that the typical asset life of ballast is 40 years but that this is reduced on the main coal routes.
2. We have assumed a sliding scale for reduced ballast life on coal routes between 32 years and 37 years. Our estimates are based on a ballast life of 32 years for routes carrying more than 10 million gross tonnes of coal per annum and 37 years for routes carrying between 1.5 and 2 million gross tonnes; with other asset values in between for traffic levels between 2 and 10 million gross tonnes of coal per annum.
3. The data on coal traffic in 2006/07 shows the following lengths of track km carrying different levels of coal traffic (millions of gross tonnes per annum):
 - 123 track km for more than 10 million gross tonnes of coal;
 - 210 track km carry between 7 million and 10 million;
 - 378 track km carry between 5 million and 7 million;
 - 814 track km carry between 3 million and 5 million;
 - 1087 track km carry between 2 and 3 million, and
 - 799 track km carry between 1.5 million and 2 million
4. Based on a typical unit cost for ballast renewal of £350/m we have estimated the increased annual depreciation cost for the main coal routes in each of the traffic categories and assumed ballast life noted above. For example for coal traffic between 5 and 7 million gross tonnes per annum we have assumed that ballast life is reduced to 34 years. The increased depreciation is $378 * ((350/34) - (350/40)) / 1000 = £0.58m$
5. Summing a similar calculation for each of the traffic bands gives a total annual cost impact for reduced ballast life of £3.9m

The current coal spillage factor results in a total charge of about £5m per year as estimated by consultants working for ORR at the 2001 freight charges review. As noted above our costing work to-date gives a total estimated cost impact of coal spillage on points and ballast of £7.1m per annum. We have not yet estimated the cost impact of track circuit failures or reduced rail life but these items are minor in comparison to points and ballast.

Charging

Our August consultation paper on coal spillage described different options for the charge as noted below:

Option 1 – Maintain the current charge

We strongly believe that the current charge does not cover the full cost caused by coal spillage, but we have not yet assessed this cost to provide supporting data. The current charge also does not provide an incentive on operators as it is levied on all loaded coal wagons regardless of type or whether they are over-filled or poorly loaded.

Option 2 – Update the current charge with latest cost information

This would make the charge more cost reflective in overall terms and would mean, all other things being equal, that there would be a slight increase in the variable charge for coal wagons, balanced by a slight decrease for other wagons. There would still be no direct incentive on operators, but the increase in coal charge would raise awareness of the issue more and would have the advantage of being simple to understand and to implement.

Option 3 – Scrap the current charge completely

This would mean that the additional costs imposed by coal spillage would not be charged explicitly and would effectively be spread across all commodity types. Clearly there would

also be no incentive on operators to reduce coal spillage. Failure to apply any coal spillage charge would result in usage charges for other commodities being slightly higher than they would otherwise be. This would therefore provide inappropriate incentives and, given the price sensitivity of certain classes of non-coal freight, this could result in traffic being lost to rail.

Option 4 – Consider contractual changes instead of a charge

This option would be to explore whether other mechanisms, such as through revised contractual provisions, could be introduced to encourage operators to improve loading procedures in order to reduce coal spillage. Group Standards give us powers regarding safe loading but these cater for extreme cases rather than general spillage and it is difficult to see whether there is any other sufficiently simple mechanism that can be developed.

Option 5 – New charge with a rebate if spillage is minimised

The coal spillage charge could be reduced for those operators who can demonstrate that they are taking steps to minimise spillage. For example, a discount could apply for an operator who could demonstrate that it had invested in equipment to reduce spillage at terminals or who could demonstrate best practice loading processes or procedures. Suitable criteria would need to be developed for this with operators. This option would have the advantage of providing an incentive to reduce coal spillage, but could be difficult to implement and open to dispute unless the criteria were simple to administer. Equally there might be disputes about who was to blame at terminals used by more than one operator.

Responses to the consultation were broadly split between those who wanted to scrap the charge completely (option 3) and those that supported some form of incentive arrangement (option 5), with some support also for contractual changes (option 4).

Most respondents said that they would like further discussion on the options when more cost information was available. We agree with this view and now that we have carried out some costing we recommend that there is further industry discussion on the appropriate way forward before any decisions are taken. For the purposes of the charges presented in this SBP we have simply assumed that the current mark up on the variable charge remains in place.

6 Capacity charge

Background

The concept of a passenger capacity charging regime was developed as part of the ORR's review of track access charges, which concluded in October 2000. It was designed to replace case-by-case negotiated capacity charges. The passenger charge is set to recover Network Rail's increased congestion costs, as a result of running an additional passenger train on the network. In October 2001 ORR's conclusions on freight capacity determined that freight operators should also be subject to a similar regime. For freight services other than Royal Mail, charges were set at 90% of passenger rates, recognising the higher degree of flexibility in freight operations.

It was intended that a tariff varying by location and time of day should be introduced. However, due to a number of implementation issues, simplified arrangements were developed for both passenger and freight services, based on an average rate per service group. The simplified arrangements were formally introduced as part of the 2003 Access Charges Review.

In the Consultation on the Structure of Charges Review in June 2006, ORR set out in its guidance that the implementation of the charge in its original form was not necessary, particularly, due to the development of the Route Utilisation Strategies (RUS) and the potential for the introduction of a reservation charge. However, ORR would expect us to take account of the following:

- the need for a greater degree of geographical disaggregation than under the current charge. This decision should be informed by the degree of cost differences between different parts of the network;
- whilst ORR would not expect us to revert to the original thirteen time bands, the decision on how many time bands are appropriate should again be driven by cost differences; and
- whether it is appropriate for our charges proposal to be calculated for each year of CP4, and so reflect changes in capacity utilisation, or be constant across CP4.

Principles

In evaluating the need for and design of the capacity charge, there are a number of fundamental principles that would need to be taken into account, which include the following:

- it should enable Network Rail to recover the costs of congestion that result in higher expected performance regime payments;
- it should be as cost-reflective as practicable to enable the full recovery of these congestion costs from incremental changes in services;
- it should provide appropriate incentives for efficient network use in terms of both geographical location and time of day;
- it should provide clear information to users on the make-up of the charge and should not impose undue transaction costs in order to understand how the regime works;
- it should not unduly discriminate between users of the network; and
- it should allow funders to make decisions about service levels.

Proposed Capacity Charge for CP4

One could argue that implementing a simplistic solution for the capacity charge based on a tariff calculation akin to the current approach would be appropriate because it would be more easily understood. However, it is unlikely that the continuance of a regime, without any temporal or geographic elements would be desirable as it is not particularly cost reflective.

We therefore propose to implement a tariff, varying by location and time of day, in a form similar to what was intended to be introduced in 2001. This would apply both to

passenger and freight services. We do not however, plan to use the 2,500 route sections or the 13 timebands in the original model to calculate the final tariff. We propose for CP4 to aggregate and map to the number of route sections in the Infrastructure Cost Model (ICM), i.e. three hundred and seven. The tariff will be bi-directional, so there will be six hundred and fourteen route sections in total. The number of timebands will be reduced to six.

The key benefit of such an approach is that the capacity charge will be more cost reflective compared to the current charge, as it would be more location and time-specific and align with a route-based charging policy. It would also provide for efficient network use in terms of both geographical location and time of day.

It has been argued that there is no rationale for a capacity charge where Network Rail is performing above the Schedule 8 benchmark. We believe that capacity charge applies equally whether Network Rail is performing worse than or better than benchmark. Where performance is worse than benchmark, the capacity charge compensates Network Rail for its additional penalty payment and where it is better than benchmark, the charge should compensate Network Rail for its reduced bonus.

It has also been argued by freight operators that when general traffic increases on the network they should get a proportion of the increased capacity charge payments. We have considered this and are planning to write to the industry separately on this issue.

Methodology

When the original capacity charge was calculated in PR 2000, it was based on the premise that a measurable relationship existed between observed levels of capacity utilisation on different sections of the network and the amount of congestion related delay that is expected as a result of an additional service. Logically this appears to be a sound proposition, as the busier that any part of the network is at a given time, the more that a specific delay incident is likely to result in knock-on delays. We therefore replicated this approach in the calculation of the tariff.

The proposed approach follows the steps shown in the flowchart in Appendix 1 and those used to calculate the original tariffs, namely:

1. *The Calculation of the Capacity Utilisation Index* – The capacity utilisation index is a key input in to the derivation of the Capacity Charge. The parameters used to calculate the Capacity Utilisation Indices (CUIs) are contained within a system known as the Capacity Map, which was developed by AEA Technology. A recalculation was done using the December 2006 timetable. Every train in the network, including freight was taken into account into the calculation of the CUI. The output was an index for each timeband over 3,500 individual sections of track known as arcs.
2. *Calculate Congested Related Reactionary Delay (CCRD)* – Congested Related Reactionary Delay (CRRD) is reactionary delay induced by general congestion on the rail network, is calculated for each section of track, which are known as arcs. This type of delay appears to be the one most likely related to an increase in capacity utilisation and can be separately identified from other types of delay. We used the CRRD, delay data for year 2006/07.
3. *Regression of CUI and CRRD* – A regression analysis was carried out between the CUI and CRRD on a pre-determined number of routes. A 'route-specific' correlation was then applied to each of the defined track sections on a route as a measure of the extent to which congestion/capacity utilisation transmits delay. Arising from this, a unique congestion-related delay function for each section was obtained.
4. *Calculate cost to Network Rail of increase in delay* – Having calculated the increase in CRRD from running an extra train, it was then costed. The costings were based on Schedule 8 payment rates derived from Network Rail's PEARS system. Because Schedule 8 is based on lateness rather than delay, it is necessary to establish the change in lateness from an increase in delay. A delay / lateness ratio is then

established by service group. Payment rates for the start of CP4 were to multiply by the delay / lateness ratios to give the cost of a minutes delay by service group. An average cost of delay per minute was then established for each of the 3,500 arcs by averaging the cost for each service group that runs on the arc, weighted by the historic delay on that arc. Finally, a set of factors were applied to scale the cost down to the portion of delay Network Rail is directly responsible for.

5. *The Final Tariff* – Network Rail’s costs were converted into tariffs and mapped to an ICM based geography. There are six proposed timebands, which comprise of the following:

- Weekday 06:30-09:30
- Weekday 09:30 -16:30
- Weekday 16:30-19:30
- Weekday 00:00 -06:30 & 19:30 – 24:00
- Saturday 08:00 -18:00
- Sunday 09:00- 24:00

The tariff was adjusted to take account of the potential for efficiency gains and was also adjusted for inflation. It also contains a ‘de minimis’ threshold, i.e. a level below which a zero tariff would automatically result, as was done with the original charge, as it would be easier to implement. Where the costs for different route sections at a particular time were sufficiently close to each other, for amounts below £2, we averaged them in order to provide a single charge which applies to all of those sections. This will make the charge more transparent and ease interpretation for our customers.

The final tariff for CP4 is set out in Appendix 3.

In 2006/07, passenger operators were billed £140 million (when the CC term is added to the capacity charge). Based on the revised capacity charge rates we have estimated that for 2009/10, the overall passenger capacity charge will amount to £127 million, which is a reduction of 9 per cent. Whilst further modelling needs to be done to determine a more precise estimate for freight income, our preliminary estimate shows a figure of around £20 million for CP4, which would be broadly similar to the existing situation.

The detailed methodology for the derivation of the tariffs shown in this document is described in our consultants report¹⁵.

The Freight Capacity Charge

We propose that the capacity charge for freight and passenger operators should be intrinsically the same. Given that extra traffic, irrespective of whether it is passenger or freight causes reactionary delay, it would be illogical to have separate regimes. Furthermore it would increase Network Rail’s administrative costs. However, in recognition of the greater flex freight operators have, we would propose the continuance of the current regime, where there is an average discount of 10% for freight operators, except for Royal Mail services.

Recalculation of the Capacity Charge

It could be argued that the capacity charge should be recalculated on an annual basis to reflect changes to utilisation to reflect beyond what was anticipated when the charges were set or changes to the actual amount of capacity through an enhancement to the network. It could vary from year to year to reflect expected changes to capacity. It is

¹⁵ Capacity Charge Tariff PR2008: Recalculating the Capacity Charge Tariff for PR2008, Faber Maunsell, October 2008. This is published on the Network Rail website: <http://www.networkrail.co.uk>

unclear whether recalculating the capacity charge during the control period would make it any more cost reflective. We therefore propose to recalculate it only for a Periodic Review. The key advantage of this approach is that it would make it easier for operators to plan services and react suitably to the incentive provided by the charge. Furthermore, it would also minimise the administrative costs both for Network Rail and Operators.

CC Term

The congestion costs of the existing level of traffic in 1999/2000 were implicitly covered by the fixed track charge in the case of franchised operators. These are represented by a term known as the CC term. Thus franchised operators are currently required to pay separately for the incremental traffic since 1999/2000 with the remainder being included in their fixed charges. This was designed to avoid unnecessary risk associated with the introduction of the new charge. We propose removing the CC term from the fixed charge to make the overall charge more transparent.

7 Electricity for Traction charge

Introduction

In October 2006 a joint working group was set up by Network Rail and the Association of Train Operating Companies (ATOC) to look at electricity prices. At the time price increases were causing considerable concern among train operators who did not generally anticipate them. The working group included franchised passenger owner groups representatives and freight operator representatives and was led by Network Rail and ATOC.

Once the group had addressed the pricing issues, the focus then shifted towards volume related issues including the trialling of on-train metering, improving the accuracy of non-metered consumption and regenerative braking issues.

Our approach to deriving Electricity for Traction (EC4T) prices and volumes is set out in the flowchart in Appendix 1.

Where appropriate, short-term changes have been made to the regime and others changes may be made before the end of CP3 in order to improve the fairness and effectiveness of the regime. Where a potential change would result in a re-distribution of costs among operators, or a change in costs, it is envisaged that such changes would be implemented through the periodic review process.

Pricing for Passenger Operators

For passenger operators, a set of prices was determined in PR2000 and was uplifted annually by the Department for Business, Enterprise and Regulatory Reform's Moderately Large Users Index (MLUI). Historically the index lagged the market. This lag effect was compounded by the fact that prices in each year were determined by the level of the index for the previous year's Q2 figure, which is published in September and subsequently revised in December. In addition, to the lag effect, it was unclear as to the contractual mix of the underlying price data that was used to construct the index.

A short-term solution was devised based on a recommendation made by NERA economic consultants to the working group. It was agreed to move to a system in which we recover our actual procurement costs. This would enable operators to mitigate their risks through the use of hedging strategies. Procurement decisions would be discussed and agreed with ATOC and the franchised passenger operators in advance. For 2007/08, the prices for traction electricity were fixed prior to the start of the financial year. This solution took de facto effect on 1 April 2007. When revising the price matrix to reflect the change, we did not take account of the structural changes in the electricity industry that have taken place since 2000, as we needed to maintain the relativities of the tariffs, otherwise there would have been a redistribution of costs among operators. However, for CP4 we propose to take account of these changes, so that the price is fully cost reflective.

As part of the change, an additional process was added to the regime; that of a cost 'wash-up' (in addition to the existing consumption wash-up). As the use of MLUI was discontinued the reconciliation process now needs to separately take account of price risk. Whilst the energy price is fixed the transmission costs may vary with demand, particularly at peak times, so the tariff that Network Rail sets at the outset is therefore an estimated tariff, rather than an actual tariff. For CP3, this cost 'wash-up' will be done at a national level, as it would not be appropriate to do it on an Electricity Supply Tariff Area (ESTA) level given that we are maintaining the relativities of the 2000 matrix. However, as we propose to move to the actual costs for each ESTA for CP4, we propose doing the cost 'wash-up' at ESTA level.

As passenger operators will be paying actual costs, it is also proposed that the price matrices are adjusted annually to reflect the expected actual costs so as to minimise the cost wash-up at the end of each financial year.

We are currently working on a longer term solution with our electricity supplier, British Energy, which provides additional flexibility to operators so that they can manage their individual risks without imposing risk on Network Rail. In essence, operators would make price fixing decisions for electricity via Network Rail or possibly with Network Rail's supplier. This may proceed before the end of CP3.

Pricing for Freight Operators

As a general principle we do not believe it is appropriate to use the Moderately Large Users Index (MLUI), as it is not reflective of prices in the market nor is it clear as to the contractual mix of the underlying price data that was used to construct it. The work carried out in the Network Rail / ATOC working group confirmed this. Furthermore, operators using such an index cannot mitigate their risks through the use of hedging strategies. However, given that freight operators consume a small proportion of overall consumption and could incur significant transaction costs in devising procurement strategies, we would propose to continue with the use of MLUI for freight users should freight operators choose not to adopt an arrangement similar to the passenger operators.

Given the significant structural changes that have occurred in the electricity industry since the price matrix was last reviewed in PR2000, we propose re-basing the charges in the matrix to the expected 2009/10 prices or at least the 2008/09 rates, (if it is confirmed that the freight regime will still use MLUI).

Derivation of Indicative tariffs

In deriving the electricity for traction tariffs, which are presented in Appendix 4, we looked at three key factors that drive energy costs and developed three pricing scenarios: low, medium and high.

We have assumed that the energy costs are driven by the following key factors:

1. **Global Warming Pressures:** under phase two of the EU emissions trading scheme, which will run from January 2008 to December 2012, carbon prices are currently at €12-20 / tCO₂carbon, which is a big increase from phase 1 where they are trading close to zero. It is uncertain how the scheme will operate post 2012 but it is likely that tougher targets will be set which may push up the price of carbon further. Together with the Large Combustion Plant Directive, electricity prices may potentially increase by around 20%.
2. **Oil and Gas Prices:** given that the costs of oil, gas and electricity are closely linked, any events, such as a new conflict in the Middle East or significant demand increases, that restrict the flows of oil and gas would have a knock on effect to the price of electricity. However, we assumed that this influence will decrease over time, due to increased investment in renewable and nuclear power.
3. **Increased Investment in Renewables:** while some renewable technologies may currently be more expensive than fossil fuelled generation, it has been assumed that a decreasing reliance on fossil fuels will stabilise or reduce the price of electricity in the medium term.

Whilst the combination of all of the factors above means that it is very difficult to predict how prices may vary in the future, it does seem likely that prices could rise above inflation for CP4.

In addition to the energy costs, we have also made assumptions regarding transmission and distribution costs for CP4. Transmission costs are regulated by the Office of Gas & Electricity Markets (OFGEM). The current price control review lasts until March 2012 and allows National Grid to raise its charges by RPI + 2% each year. From April 2012 it has been assumed that the same regime will continue to apply. For distribution costs, which are also regulated, the current price control which last until March 2010 and allows the

Distribution Network Owners (DNOs) to raise its charges by RPI each year. From April 2010 it has been assumed that an RPI increase will continue to be applied.

Electricity Volumes

Further to the work on pricing, the industry focus has now moved to the area of electricity volumes.

DeltaRail were recently appointed by Network Rail and ATOC to conduct a thorough review of the end to end processes, specifically focusing on a number of areas which are of concern to operators, which include:

- visibility of the likely 'wash up' adjustment from year to year (both in terms of size and direction);
- the integrity of the underlying data and consumption rates used to derive the modelled consumption figures; and
- the interaction between the discount applied to users of brake regenerative braking and the 'wash up' adjustment. This can result in a situation where operators who do not use regenerative braking face higher energy bills.

It is expected that DeltaRail will report back to the working group in early November 2007. Where possible any recommendations arising from the study may be implemented prior to the start of CP4.

Regenerative Braking

In PR2000 a uniform cost discount of 16.5% (based on a consumption reduction of 20%) was introduced in which was based on an analysis of consumption of Heathrow Express trains before and after regenerative braking came into use. At the time of the Regulator's determination in 2000, the only rolling stock which the 16.5% discount applied to was the Class 323 rolling stock. However, since 2000 other vehicles have been introduced on the AC network with regenerative braking capability. Given that Heathrow Express was based on a particular configuration, is unlikely that the 16.5% discount will be appropriate where there are different configurations. Furthermore, it is expected that regenerative braking will be rolled out on the DC network over the next couple of years.

Although in the longer term the industry is likely to move to universal metering, there is a need to come up with a more cost reflective discount to address operators' concerns in the interim. This issue is becoming increasingly important given the growing significance of the consumption wash-up and the roll out of regenerative braking capability across the network. By 2008, Network Rail is aiming to make the whole AC electrification network capable of absorbing regenerated braking energy and we are also examining technical solutions which will provide the required capability on the DC third rail network.

For CP4, we propose to continue with the concept of a discount mechanism in the price list. However, there should be a differentiation between AC and DC and within these categories where appropriate.

For the AC network, we propose that for long distance services a discount of 16% should apply. This is based on observed data from the recent Virgin Pendolino metering trial and is just marginally lower than the current blanket discount. For local / regional / commuter services we propose a discount of 20%, which was based on an analysis of C2C consumption data. We also propose an 18% discount for outer suburban stock.

Following discussions between Network Rail and ATOC, for DC we would ideally like to differentiate the discount based on the four proposed Southern region ESTAs which we are looking to introduce on 1 April 2009. For the Central ESTA we believe a discount of 15% is appropriate and for the Wessex, Sussex and Kent ESTAs the discount should be 5%, reflecting the lower propensity to regenerate energy in areas where the traffic is less dense. The discounts are based on international experience in this area and

engineering judgement. Further work is being carried out to confirm the ability to bill these discounts based on the proposed geography.

However, given the likelihood that greater evidence may come to light as to the true extent of the savings, in particular from metering, we also propose that the operator should be allowed to provide evidence if it believes that a different discount is more appropriate. We therefore suggest that the above discounts should be treated as default discounts. In the event that no evidence is submitted, or the evidence submitted is insufficient or unconvincing, then the default would automatically apply. Strict rules regarding the admissibility of evidence would need to be set in advance, so as to avoid the potential for disputes.

The financial benefit of regenerative braking is not identical to the consumption benefit since part of the total cost of electricity is fixed and is not reduced by the regenerated energy. The fixed proportion of the total cost will vary year on year depending on the cost of energy (i.e. as the energy cost goes up, the percentage that is fixed will go down). It is anticipated that over CP4 the fixed percentage would not change by more than +/- 2%. At current energy rates the variable element of the total cost is estimated to be 92.0% (i.e. 8% of the total cost is fixed).

Consumption 'Wash-up'

In order to improve the granularity of metered data we increased the number of ESTA's from 12 to 26 on 1 April 2007 to provide more information to operators. However, the consumption wash-up will continue to be based on the 12 areas during CP3. We are currently looking at the feasibility of increasing the number of wash-up areas further to potentially 40 from 1 April 2007 and conducting the 'wash-up' on this basis.

Consumption Modelling

Due to the retirement of TRATIM, a system used for train planning purposes and also for the calculation of consumption rates for vehicles, we are currently developing a new model to calculate consumption rates.

Freight and the Consumption 'Wash-up'

Under the current arrangements there is a risk for a freight operator that actual consumption could be lower than the estimated consumption and therefore the operator ends up paying more than it should do, by virtue of being excluded from the wash-up. The exclusion of freight from the 'wash-up' also poses a risk to other operators, as they could potentially be paying for a greater volume of electricity than they consumed. We are also conscious there is a need to promote energy efficiency, so there should not be a perverse incentive for an operator to consume more electricity than estimated. We therefore propose that freight operators should be included in the consumption wash-up. However, where a freight operator installs a meter on the train and is billed on that basis, we would exclude that operator from the 'wash-up' process.

On-train Metering

ORR, in its consultation on the 'Structure of Charges Review' in June 2006 set out in the guidance that it would like us to further consider the issues surrounding the introduction of on-train metering in tandem with the industry. It also stated that it would expect us to build on the findings of the AEAT report and consider a more geographically disaggregated approach to determining discounts for regenerative braking. The accuracy of these discounts was also raised in the traction electricity procurement review.

In parallel to this there is a growing awareness in the industry that we should not become complacent about rail's environmental advantage.

We set out below the issues raised in our discussions with the industry regarding on-train metering in various fora over the past year. It takes account of the merits of on-train

metering, the issues we would need to consider if it were to be implemented and the strategy to take it forward.

The case for metering

The fitment of energy meters on trains would confer a number of benefits:

Accuracy

Metering would enable the measurement of the correct amount of electricity consumed by each train. This will in turn impact on two key elements of the current traction regime, namely, the modelled consumption approach and the regenerative braking discount.

Whilst the actual consumption can be established reasonably accurately through a modelled approach when there is just one user using a supply point, it will invariably result in errors where there is more than one user.

Energy Efficiency

Metering would enable operators to monitor each train's energy efficiency and allow companies to demonstrate the benefits of energy saving driving techniques. Studies carried out in this area, particularly in Scandinavia, have shown that significant energy savings can be proved through 'on-train' metering. Although rail continues to have an environmental advantage over other competing modes of transport, these other modes, in particular roads, have improved their environmental performance due to legislation, fiscal pressures and consumer demand. Rail therefore needs to take action to ensure that its position is not further eroded.

Self-Procurement

The Electricity Act 1989 in theory allows an operator to buy its own electricity. In practice this is subject to the resolution of a number of technical, legal and commercial issues. In particular, metering would be required to facilitate this. During the traction electricity procurement review, the issue was raised but it was acknowledged that this should be considered a long-term aim.

Strategy

To ensure that rail's environmental advantage is maintained and the issues raised during the procurement review are addressed, in particular the discount for regenerative braking and the longer term aim to enable self-procurement, it is imperative that metering is rolled out.

The Department for Transport (DfT) in public fora, bilateral meetings and in their 'Rail Technical Strategy', which was published in July 2007, have argued that it is desirable that trains have meters and envisages that this will happen by 2012. In the White Paper 'Delivering a Sustainable Railway', the DfT state that "the critical next step will be to fit on-train meters to provide train operators with a real incentive to reduce electricity consumption."

At present, ATOC and DfT are working together on an initiative to demonstrate the feasibility, costs and benefits of energy metering on trains, building on work already carried out in Germany and Scandinavia. One of the key aspects of this has been a metering trial project on the West Coast for the Virgin Class 390 Pendolino fleet. This was funded by the DfT and supported by Network Rail. It is envisaged there will be further trials of this nature.

Network Rail and ATOC in particular believe that in order to minimise the discrepancies that can occur from the attribution of energy, where there is more than one operator there is a compelling argument that at least those trains which travel across large parts of the network should have meters installed and be billed on that basis.

Implementation issues

In considering the introduction of metering there are a number of factors that would need to be considered, which include the economic feasibility, technical and legal issues. We deal with each one in turn:

Economic feasibility

A cost benefit analysis would need to be carried out to determine whether there is a business case for metering. The following factors should be taken into account.

- the costs of fitment of 'on-train' meters, position and communication devices and the set-up of a settlement system;
- the ongoing operational costs for a metering system; Indicative prices have been obtained for individual fleets but the costs for a national scheme would need a tendering exercise. The Union Internationale des Chemins de Fer (UIC) is developing a 'model business case' to support administrations implementing metering; and
- whilst metering in itself does not save energy, it is a means to manage energy and can be used as a mechanism to ensure those who improve efficiency are rewarded.

Technical issues

There are a number of technical issues that would need to be considered before we could proceed with metering:

- technical issues regarding metering for the 25kV stock and the 750V stock. Whilst the 25kV stock would appear to be straightforward, we believe that the 750V is more problematic because of the multiple pick-ups. A specific solution that works from the on-board computers rather than metering in the true sense might be more appropriate for the 750v fleets.
- dual voltage stock (we understand that it is intended to explore the issues with a proposed pilot for the class 319);
- The accuracy requirements for meters would need to be determined. We understand that if electricity is procured via Network Rail the level of accuracy may be agreed bilaterally. However, if operators wish to purchase direct then requirements may be more stringent. This is an issue that is being considered at a European level by the European Rail Agency (ERA). It should be noted that there are technical limitations on accuracy (particularly across a range of operating temperatures) for DC meters.

Meters were fitted from new on the Class 333 but they do not record position or automatically communicate the data to a central system. A trial is underway with a communicating meter and position recorder on a Virgin Trains Pendolino, and this may be followed by trials on First Capital Connect and Southern Railway.

Legal issues

We would need to determine what the standard for meters should be, taking into account requirements the UK electricity industry. We would also need to establish whether there is a requirement to comply with EU metering standards.

Way forward

It is recommended that Network Rail representatives, ATOC representatives and the DfT and Transport Scotland continue with the work to facilitate the roll-out of metering. The following issues would need to be considered further by the group:

- the commercial issues regarding metering;
- technical issues for the roll out of meters;
- legal issues regarding metering;
- data management and settlement issues;

- where there is no-metering or there is meter failure, a protocol for the entry of unmetered data, and assumptions to be made about missing data would need to be agreed; and
- how to treat transmission losses, particularly during a transition period when some trains may be metered and others not.

Although on-train metering could facilitate self-procurement, the issue has not been explored here. However, if on-train metering were to lead to self-procurement there would be commercial, technical and legal issues that would need to be considered.

We are currently looking at changes to our billing and data systems, so we can facilitate the billing of electricity for traction based on meter readings.

8 Station Charges

Introduction

In considering station charges for CP4 for both franchised and managed stations, Network Rail has examined both Long Term Charges (LTC) and Qualifying Expenditure (QX) in consultation with the industry. This paper addresses the proposals in relation to the future of long term costs which have historically been charged out via LTC, but a short summary is also provided below of the current situation with QX.

Qualifying Expenditure

Network Rail is in the process of agreeing two-year fixed offers at some of its 17 managed stations and would like to secure a fixed offer for CP4.

The Industry Steering Group (economic and contractual framework) (ISG)¹⁶ and an ATOC sub-group have been examining the potential for a fundamental review of the QX arrangements. The possible benefits of a wholesale shift to new arrangements are slightly more complicated than they might otherwise be because QX is not a regulated charge and cannot be formally reviewed by ORR as part of the periodic review. Consequently in the event of changes in the level or structure of the charge, 18.1/Schedule 9 arrangements would not neutralise the effect.

However, Network Rail considers that fixed term offers have benefits to the industry, and as discussed at ISG will consider new ways to achieve fixed deals for the duration of the control period with train operators at its managed stations.

The remainder of this section 8 relates only to station long term costs and charges and does not address any further points regarding any station management costs which are charged out via QX.

Long term costs & charges

At a cross industry meeting in April 2007 Network Rail presented a paper setting out options for long term station charges for CP4, following papers to ISG in November and December 2006¹⁷. Our original proposal involved trying to harness the benefits of a portfolio approach to stations. Due to the significant degree of change surrounding stations at present we also proposed the option of rolling forward current charges.

Responses were received from South West Trains, ATOC, First Group, Arriva Trains Wales and Transport Scotland. We have also discussed the options in further detail with ORR.

The responses we have had to our April 2007 paper have led us to conclude that, provided sufficient information about planned expenditure at stations can be made available to train operators and funders, it is not necessary to have a separate station long term charge, but that station costs could be incorporated in the Fixed Track Charge instead. This was discussed with ISG in July 2007.

A paper was subsequently circulated to the industry on 23 August 2007 and further responses were received from First Group, Govia, BAA, ATOC, Transport for London, Transport Scotland and ORR. This paper addresses the comments raised in relation to

¹⁶ ISG is an industry body which has oversight of the contracts between Network Rail and its train operating customers. ISG is chaired by Dominic Booth (NED Railways), Graham Smith (EWS) and Paul Plummer (Network Rail) and membership consists of representatives from non-franchised passenger operators; Association of Train Operating Companies; Rail Freight Operators Association; Network Rail; Department for Transport; Transport Scotland and Office of Rail Regulation.

¹⁷ Papers are available on our website.

Network Rail's papers. References to station costs do not include costs billed currently via QX.

Our proposal

Network Rail proposes that station long term costs should be recovered from Station Facility Owners via the Fixed Track Charge. This will be balanced by provision of information about our cost assumptions which can be found in the supporting information to the station strategy (document reference NR/SBP/OCT07/AM11), and our plans to provide increased reporting within our Annual Return.

At a high level, we consider that this is the right way forward because it will allow industry focus on stations to be raised to a portfolio level in a way which minimises the revision required to the existing contractual structure (at a time when the industry is working towards implementation of the Stations Code). The proposed increases in reporting on spend in the Annual Return, as well as clarity on our cost assumptions in the SBP, are intended to support the relationship between Network Rail as landlord and our train operating customers at stations, in a way that we consider the current charging structure cannot.

We intend to include station costs (excluding "operation" costs at managed stations which would be recovered via QX) in the Fixed Track Charge. The calculation of these charges will be issued separately from the SBP. However, we note that respondents have concerns about the proposed approach, and fully anticipate further discussion with the industry on this issue at ISG and in other industry fora before the way forward for CP4 is finalised.

Industry views on proposals

There was little support for the proposal to roll forward charges, and respondents raised a number of useful issues in correspondence and at ISG. We have addressed the key concerns below, and demonstrate how these points have led us to conclude that station costs should be included in the Fixed Track Charge. We have also picked up the points made in relation to our August 2007 document.

Transparency, accountability and clarity

The consistent theme in the responses received was regarding transparency of costs and accountability, and additionally in ensuring that the structure of charges is clear to the industry as a whole. South West Trains stated in June 2007:

"All costs and charges must be transparent, auditable and easily understood."

We agree with this sentiment and the need for increased cost transparency in relation to stations. We also note that setting straightforward and clear charges aligns with ORR's charging objectives. We consider that increasing transparency is very important. In relation to charging we are concerned that individual station charges can never accurately match emerging expenditure at stations because charges will reflect long run costs, and that if station costs are provided transparently, charges at station level add little benefit and may be inconsistent with charging principles (we address this in further detail below).

In its September 2007 response ATOC noted:

"In [train operators'] view [LTC] represents a payment which relates to a service and forms a readily visible amount from which service provision, or lack of it, can be questioned. ...it seems counter intuitive that a charge which has a clear function should be withdrawn."

We also note both ATOC and First Group's comments that track and station access are rarely dealt with by the same person. We note these concerns. We consider that our proposal is focused around providing transparency of what we propose to spend on stations and as such the fundamental principles of the relationship between service provider and customer will be preserved in a manner which will allow meaningful

discussion at a portfolio level. Our proposals (outlined in further detail below) are that reporting information will be provided to train operators regarding actual spend and we would seek to reassure train operators that Network Rail is committed to the preservation of remedies in the event of breach of obligations and failure of the relationship. Taken as a whole, this should provide sufficient information (and surety) to strengthen the day to day relationship between train operators and Network Rail around stations.

We plan to report the expenditure we incur in much more detail than in the past so that customers and other stakeholders have more visibility of the costs incurred at stations; this will improve transparency and help all industry parties make more informed decisions on future proposals at stations.

We are not currently able readily to report as much breakdown of expenditure as we would wish, but over the next year we plan to develop our cost reporting and coding procedures. The aim of this is to be able to report the following cost breakdown each year in our Annual Return:

1. expenditure at stations aggregated for each SFO;
2. overall station expenditure disaggregated by 8 main work categories i.e: a) platforms; b) roof; c) footbridges; d) lifts/escalators; e) electrical such as lighting; f) car parks; g) buildings; h) other such as minor/reactionary repairs. We will probably also include a separate category for station surveys or inspections.

When undertaking renewal and maintenance work at stations we often package it to achieve efficient procurement such that the individual contracts cover several different activities at several different stations along a route. Clearly this makes disaggregating the costs by activity or station difficult and so our review of reporting arrangements will need to consider how this is best handled in future. It may be that some level of cost allocation based on simple metrics is needed to report the increased disaggregation we wish to achieve.

We also note that additional accountability and transparency will be provided under the terms of the Stations Code, with the improved remedies and mechanisms such as abatement, self help and station work plans.

Outputs and long run costs

ATOC asked in their paper of 29 June 2007:

“What is the output to be delivered? What is the long run cost of that output in light of the Corderoy report and subsequent work undertaken by Network Rail? Where are we on the long run cost curve?”

Network Rail is committed to its output obligations as stated in our Network Licence Condition 7, i.e. to “...secure:

- (a) the operation and maintenance of the network;
- (b) the renewal and replacement of the network; and
- (c) the improvement enhancement and development of the network,

in each case in accordance with best practice and in a timely, efficient and economical manner so as to satisfy the reasonable requirements of persons providing services relating to railways and funders...”

We view this as maintaining a steady state asset condition over the portfolio as a whole. Over CP3, as quantified by the Station Condition Index, this has largely been achieved.

We are developing our core expenditure plans for CP4 on the basis of maintaining non-deteriorating condition of the station portfolio, subject to the deliverability and affordability of the predicted level of work during the control period. Further detail on asset policies at stations is set out in the Operational Property asset policy (see supporting document reference NR/SBP/OCT07/AM05).

Structure of charges

The introduction of a more appropriately weighted measure, the Stations Stewardship Measure, will facilitate higher levels of transparency of performance against this objective. The introduction of the Operational Property Asset System (OPAS) and the ongoing inspection activity that is providing asset inventory and condition data will enable more informed and consistent asset stewardship. When populated it will provide the means to more effectively compare condition across the whole portfolio and in doing so facilitate better prioritisation of maintenance, repair and renewal (MR&R) activity. The system will also generate and maintain activity and condition data which will be used to inform understanding of long run cost implications and the potential of differential approaches to asset stewardship to better serve the industry.

Changing maintenance, repair and renewal responsibilities

The move to the Stations Code facilitates (but does not automatically result in) a shift in MR&R responsibilities. Schedule 8 of the code provides a template revised split of responsibilities, as determined by ORR in June 2004 following industry consultation although parties may seek to agree a different split. We expect that any revision to responsibilities must be agreed primarily between Network Rail and the SFO, but as an associated Station Change proposal is required, beneficiaries will also need to agree to the change.

In their responses to our April paper, ATOC, Arriva Trains Wales, and First Group all referred to the shift in MR&R responsibilities.

In their paper of 29 June 2007 ATOC noted:

“We do not believe there is a particular problem with charging on a portfolio basis (although this may cause minor problems with franchise remapping) and there could be value in it in terms of negotiations in respect of changes to MR&R responsibilities.”

ATOC also stated in that paper:

“...charges have to achieve recovery of costs, a clear understanding of required outputs and cost causation and a sound basis for discussions about changes in MR&R responsibilities”.

We consider that ATOC’s concerns again relate to transparency and visibility of this information. We agree with these aims for CP4, and consider they can be delivered through our proposals set out below.

A shift in MR&R responsibilities and the associated change in charges between Network Rail and train operators is an important next step for the industry: the current situation of split responsibility for individual assets is unhelpful, unproductive and confusing. There are a number of options for a revised split of responsibilities. Network Rail is concerned with achieving simplicity and clarity in the arrangements and we accept that the “right” solution for one operator may not be the same as for another. However, we believe that having an entirely different split of responsibilities with each operator would result in inefficiency. As such we consider there are likely to be two or three options for a revised split of responsibilities, and we look forward to examining these in more detail with operators.

Negotiating a different shift in responsibilities between Network Rail and the SFO on a per station basis would be impractical – it will need to be achieved by negotiation on a portfolio basis. First Group appear to agree, commenting in their letter of 2 July 2007 that:

“Having to negotiate MRR shift independently with NR on an individual station by station basis is likely to significantly increase costs of shifting MRR responsibilities which in turn may be a major disincentive for TOCs contemplating implementing the Stations Code”.

Provision of greater transparency of modelled costs by Network Rail will be beneficial to this process, but we note that even this will not give a generic answer and additional cost

work will always be needed when responsibilities are being re-negotiated. The population of Network Rail's Operational Property Asset System will be used to inform this discussion.

Additionally, in order to arrive at a truly efficient split of responsibilities, it will be necessary for train operators to also share cost information. In our August document, we stated that:

"In these negotiations, both parties will need to consider how to achieve the optimal outcome taking into account differences in approach between maintaining the needs of a landlord with a long term interest in the asset whilst maximising delivery for an operator with a short term franchise interest."

Govia responded however that:

"...we do not agree that Network Rail's needs as a landlord might diverge from the relatively short term delivery requirements of an SFO... A sound long term strategy should serve to complement short term delivery."

We consider that our views expressed in August are in line with those expressed by Govia. We do not think it is necessarily the case that the interests will diverge - but consider that in discussions regarding moving to a revised split of responsibilities, parties should give explicit consideration to this question, in the context of optimising whole industry costs in the longer term.

Inequity in spend at stations and ring fencing

First Group stated in its letter of 2 July 2007:

"The paper talks about the unfairness of the existing LTC allocation between TOCs. What it does not say is how this allocation currently works, whereby a significant proportion of LTC is being spent on individual projects, such as upgrading major stations, whilst the stations to which the LTC payment is supposed to relate continue to deteriorate and the SFO TOC gets criticised for underperformance in terms of station facilities and upkeep."

The nature of the asset life cycles means that there will always be an uneven spend profile across the portfolio, as indeed there is with any asset type such as track, signals, etc. A renewal of major assets at stations such as train shed roofs or platform canopies which have long asset lives will be a substantial cost in a single control period but might occur only once in 10 control periods.

Network Rail's obligation to maintain non-deteriorating condition is recognised, as are its obligations under the Station Access Conditions (and, when implemented, the Stations Code), but the nature of station asset lives which typically are long means that any expectation that actual spend within a five year control period will mirror the longer term cost profiling is unrealistic at a highly disaggregated level.

Network Rail has provided cost estimates for franchised and managed stations for CP4 which are set out in the station strategy supporting documents (document reference NR/SBP/OCT07/AM11). We will set out our expected expenditure and outputs in our March 2009 Business Plan to give our customers an expectation of activity at the portfolio level. Any modification would be transparent with explanations of any variances. Disaggregated spend would be reported in the Annual Return.

First Group also raised the issue of ring fencing (in their letter of 2 July 2007) and were subsequently supported by Govia (26 September 2007). First Group stated that:

"Ring fencing LTC would in FG's view enable significant improvements in station performance, create opportunities for accountability and spending efficiency and enable more effective business planning."

However, we continue to consider that it is not realistic to specify actual spend in a particular time period at a station by station level, but provision of our modelled cost

information at an appropriate level of disaggregation, i.e. at portfolio level, will allow operators to form a reasonable expectation of spend across that portfolio and in the event that actual spend does not match anticipated spend we will explain the reasons for this. Together with the increased reporting during CP4 described earlier, this will allow greater transparency and accountability. We consider that formal ring fencing would be inappropriate. It must be appropriate for Network Rail to retain the same flexibility as is afforded to all other operators in the industry to prioritise spend as necessary across its business in order to remain reactive to events and manage the national asset portfolio. However, changes at this level would be explained in a transparent way through our normal reporting processes and we would expect to discuss these matters with the SFO as our plans evolve.

In the event that contractual obligations at stations are not fulfilled, there are contractual remedies available to operators; under the Stations Code these processes are improved. We will need to work together to minimise any tension that could arise due to the franchise- or PTE-related performance regimes that train operators have signed up to and we will always seek to meet customers' requirements where appropriate.

Marginal costs at stations

In its June 2006 charges principles document, ORR requested that Network Rail take account of the work produced by Corderoys in its charges proposals. As such, we referred to this report in our April 2007 document¹⁸. We note that operators have not had an opportunity to see the final Corderoys report until its publication on ORR's website in September 2007. The report makes the following (high level) comment regarding marginal costs:

"The following factors were ... examined in order to decide whether or not they had a significant effect on the average cost of maintenance, repair and renewal for stations...

Footfall was not considered to have a significant effect on average costs"

Network Rail agrees with this statement. There are certain set costs associated with maintaining and repairing assets which are generally not affected by fluctuations in footfall. Additionally, it should be noted that footfall may fluctuate over the period of an asset life or even within a control period whether one operator calls at the station or several. We do recognise however that footfall and revenue are indicative of the value of stations to SFOs and passengers alike and have developed a policy application regime which supports higher levels of activity at stations in the higher categories. Whilst we are committed to maintaining steady state overall, it is seen as appropriate that the maximum number of rail users benefit by prioritising MR&R activity in this way.

ATOC (which we understand has seen the final version of the Corderoys report) commented in its paper of 29 June 2007 that:

"Portfolio charging would make charging beneficiaries for LTC difficult; however, given that the marginal costs at stations are very low there is an argument that this could cease with little or no effect on incentives."

We agree that ending the charging of beneficiaries would have no impact in incentives as marginal costs of additional traffic are negligible. It is an established charging principle that open access operators should only pay the marginal costs associated with the use of

¹⁸ Available on Network Rail's website here:

<http://www.networkrail.co.uk/browse%20documents/regulatory%20documents/access%20charges%20reviews/consultations%20on%20future%20charging/general%20charges/b%20-%20stations%20principles%20paper%20april%202007.pdf>

the network. We consider that there is no reason why stations costs should be charged under different principles.

We note that if beneficiaries do not contribute towards station costs this will result in a shift in funding responsibility from non-franchised passenger operators (who currently contribute) to the Department for Transport and Transport Scotland (as these operators would no longer contribute). We consider that this is in line with the principle that such operators should only pay marginal costs. We identify below that in the event that a non-franchised passenger operator proposes an enhancement at a station, we consider they should be required to contribute to these costs.

Contractual implications

At ISG in July, ATOC asked what the contractual implications would be of setting the LTC to zero and adding station costs to the Fixed Track Charge. We have sought to minimise the level of adjustment required to existing contracts, and have focused on how existing processes can be adapted while delivering the benefits of a portfolio approach at stations. This recognises that the current arrangements mean that there is a separate set of Station Access Conditions for each of the c2500 stations, and also that any changes to the current contractual structure would need to also be reflected in the Stations Code. It also recognises that substantial changes in contractual processes at a point where the industry is working towards adoption of the Stations Code (itself a contractual upheaval) would be unhelpful. We consider that proposed revision to the way station costs are charged however would deliver the benefits of a portfolio approach in time to support initiatives such as the shift in maintenance repair and renewal responsibilities.

Where bespoke arrangements exist with operators, specific analysis will be required with the relevant parties and ORR. However, we have examined the implications for the standard contractual arrangements as follows.

Station access contracts

Under the Station Access Conditions (SACs) the ability of the ORR to reset LTC is recognised via SAC Condition F11.5. There is an equivalent in the Stations Code (Condition 23.4). If LTC amounts were set to zero, the effects of this would be as follows:

Generally

In broad terms, the SACs and Stations Code would continue to operate effectively with zero LTC (as indeed is the case at present, where zero applies). There are, however, three areas where the implications should be noted: abatement, LTC recovery and liability thresholds.

Abatement

LTC cannot currently be withheld, but train operators may deduct amounts from the LTC where abatement payments are due from Network Rail for breach of its obligations to maintain/repair specified assets. LTC at franchised stations is payable to Network Rail by the SFO as rent under the station lease, and this includes the shares of LTC which TOC beneficiaries pass to the SFO as part of their access charges. The SFO is not liable to pay beneficiaries' LTC that it does not receive. Where abatement is due, TOC beneficiaries may deduct it from the LTC component of their access charges payable to the SFO, and the SFO may deduct its share from the LTC component of the station lease rent.

The effect of setting LTC to zero will be that, while the amount due for breach of obligation will still be payable by Network Rail, there will not be LTC from which this may be deducted.

There are three options for addressing this in the event of landlord breach:

- i) Amend the track access contract through a periodic review notice to allow unlimited deductions to be made from the Fixed Track Charge in the event that abatement is due under the stations regime.

Structure of charges

ii) Amend the track access contract through a periodic review notice to allow deductions to be made from the Fixed Track Charge in the event that abatement is due under the stations regime, up to a capped level (i.e. a percentage of the charge).

iii) Leave the provisions as they are (just as they would apply at present, where LTC is set at zero). In the event that abatement is due, train operators will continue to be able to make a claim for abatement amounts but the ability to withhold LTC will be ineffective as the amount will be zero.

We would propose that option ii) is selected since this is closest to the existing arrangement.

The following considerations arise in relation to these options:

- under the current regime, the level of deductions (as distinct from the level of claims) is effectively capped at the level of LTC – option ii) seeks to ensure that any deductions would still be capped at a reasonable level, unlike option i), leaving Network Rail able to demonstrate certainty of income in relation to Fixed Track Charges;
- both options i) and ii) would need modification if the situation is to be avoided where a TOC as beneficiary is able to deduct abatement from Fixed Track Charges, but is not contributing towards costs through those charges in the first place. Neither of these options nor any modification need affect beneficiaries' rights, in the case of the SFO's default, to claim abatement against non-LTC station access charges levied by the SFO (including Network Rail at managed stations); and
- while option iii) would not leave in place LTC from which abatements might be deducted, this may be reasonable given that the conversion of LTC from a station rent to an access charge has implications for recovery of LTC by Network Rail (see below).

ATOC (September 2007) suggest that this approach would be "...both bureaucratic, as the proportion would need to be defined, and confusing". The definition of the proportion would be relatively straightforward as it would be one amount per SFO, defined according to clear principles. We do not see why this should be confusing to train operators as the basic elements of the concept of abatement remain the same; there would simply be a slightly revised method of achieving this.

LTC recovery

While LTC is a regulated access charge, it is also reserved as rent under franchised station leases. Therefore, landlord's remedies apply to its recovery, and non-payment could give rise to forfeiture of the lease or levying of distress (i.e. seizure of assets) against the tenant's property at the leased station, subject to statutory protection for franchise assets. The effect of resetting LTC at zero would be to take away those remedies in respect of recovery of the relevant charges.

Liability thresholds - de minimis claims

Under the SACs, there are liability thresholds in order to ensure that industry management time is not unduly consumed by small claims for breach. These liability thresholds are generally set at a percentage of access charges, or relevant shares of QX or LTC, subject to a standard minimum. A re-setting of LTC to zero would be likely to make the standard minimum apply to more stations i.e. more smaller claims could be pursued. This will not be relevant when stations are converted to the Stations Code, as thresholds are specified that would be unaffected by LTC levels.

Track access agreements – Fixed Track Charge

No change would be required to the Fixed Track Charge formula in Schedule 7 of the track access agreements. The revised treatment approach to recovering station costs would form part of the calculation of the Fixed Track Charge, the values for which will be defined in the periodic review notice. If option 2 above is selected for dealing with landlord breach, we would envisage track access agreements being revised in order to reflect the right of an SFO to withhold a specified percentage of the Fixed Track Charge,

only in circumstances where it would have been within its right to withhold LTC under the station access regime.

Franchise remapping

ATOC raised the point that charging on a portfolio basis may cause a problem in the event of franchise remapping. We agree that this would need to be addressed, although this is an issue that the industry would face in any event. Currently where a franchise is remapped during a control period, the Fixed Track Charge is adjusted according to vehicle mileage. As such, in the event that a franchise is remapped, the stations element of the charge would be remapped according to the SFO portfolio. This is no more complicated than the remapping of other charges that takes place at refranchising.

In the event that franchises are remapped once the industry has moved to the Stations Code, it is feasible that a franchise may be initially constituted of stations which are under different splits of maintenance, repair and renewal and therefore with different financial arrangements. Even with a per station long term charge and a per station negotiated revised split of responsibility, splitting and reforming franchises would be likely to result in unsatisfactory inconsistent arrangements that will need to be addressed by negotiation between Network Rail, the new SFO and the beneficiaries at the station. It is tempting to see it as easier to negotiate with a per station charge than with a portfolio charge, but in reality the same issues will need to be addressed and overcome on a case by case basis. It should also be noted that franchise remapping is generally driven by government which would face both sides of any transfer in cost/charge between franchisees.

Enhancements

There are a number of options for the treatment of enhancements: (a) that they are handled through supplemental agreements; (b) that an increase to the Long Term Charge is included as part of the station change; or (c) that the third party enhancement agreements are used for operators who directly sponsor and finance an enhancement for their own benefit.

Supplemental agreements under Section 22 or Section 22A

There are a number of difficulties posed by this approach such as:

- timescales associated with supplemental process are lengthy and station change would still be required resulting in duplication of process;
- there is no dispute mechanism to available to Network Rail; and
- beneficiaries could impose costs by proposing enhancements without contributing to them.

We consider that these drawbacks could be addressed by simplifying the process. Any station change proposal could contain an obligation on the parties (i.e. any party that would benefit from the change) to complete a supplemental to their track access contract – and the outline supplemental could be included as part of the station change proposal. Any party which attempts to renege on the obligation to complete a supplemental would be breaking the terms of the station change. To address the duplication of process, ORR could issue a TAA general approval to cover any changes to charges that have already been through the station change process.

Adjusting Long Term Charge or creating an access charge

The option of using LTC for the purposes of charges adjustments following enhancements could be retained; however there are also difficulties with this approach:

- if the existing contractual provisions are left unaltered and the charge increased from zero, the SFO would be obliged to bill beneficiaries again, which was one key benefit of removing the charge; and
- this could result in confusion about the status of the charge

It is possible to find ways to address these issues (particularly by the billing of beneficiaries), but these would add a layer of complexity to the existing arrangements rather than simplifying them.

Discussion

There are merits in handling enhancements via station change proposals which include an obligation on each operator that benefits from the change to complete a supplemental track access agreement, a form of which may be attached to the proposal. ORR general TAA approvals and guidance on calculation of total cost to be charged and mechanisms for charging (similar to Fair Deal guidance) will be needed. However, we believe that we should also have the option of recovering costs through an LTC provided the requirement to recover from beneficiaries was removed. As noted above the third party agreements remain a suitable means of handling enhancements sponsored and financed directly by operators.

First Group's response of 12 September 2007 suggests that it would not be appropriate to use LTC for enhancements. We note that the ORR is currently drafting revised guidance on charging adjustments following enhancements and we therefore suggest that this issue is dealt with under that consultation.

Stamp Duty Land Tax

An effect of re-setting LTC to zero (but not a reason for doing so) would be to reduce the level of rent reserved by station leases. Train operators may wish to consider the potential for any different impact in Stamp Duty Land Tax treatment for new lease grants.

We agree with First Group (12 September 2007) that the opportunity must be taken to review the situation in relation to SDLT. ATOC (September 2007) asked whether Network Rail has obtained a legal view as to the tax position under the proposal to include costs in the Fixed Track Charge. As noted above, we consider that further industry discussion is required in relation to Network Rail's charging proposal in general. When the industry has reached a view on (or ORR has determined) the structure of charges for CP4, we will be happy to work with ATOC in considering the tax implications of the chosen structure.

We note Govia's comments that the "financial element of the LTC calculation" be removed. We would like to reiterate our previous papers on the structure of charges (November 2006) that a return on the Gross Book Value of stations will not be included anywhere in our charges proposals as we do not feel that this element of current charges serves any purpose.

Drawbacks of other approaches to charges

In their September 2007 response, Govia suggested that charging LTC at a portfolio level would be the preferable approach. We have previously considered this option but consider that this option is the most challenging due to the level of change required to the Station Access Conditions in place at each station. This would require substantial rewriting of the current contractual provisions and each set of SACs at each station would need to be changed (and associated adjustments would be needed for the Stations Code). As noted above we have proposed a solution improves on the current situation by delivering a portfolio focus while minimising disruption to the existing contractual processes. We consider that this is desirable at a time when the industry is seeking to move to the Stations Code, and also seeking to achieve a shift in maintenance, repair and renewal responsibilities. Instead we have sought to find solutions within the existing processes rather than proposing wholesale contractual change.

Consequently, we consider that the approach of placing costs in the Fixed Track Charge would deliver the benefits of a portfolio level approach, and can be achieved by working within existing processes. We believe this is preferable to retaining the existing per station LTC.

Network Rail's proposal

The responses we have had to our proposals so far have led us to the following conclusions:

- Clarity and transparency of costs are the industry's main concerns.
- There is little/no justification for setting charges differently for stations as for other charges (i.e. not on the marginal costs).

We therefore propose that for CP4 long term maintenance, repair and renewal station costs are included in Fixed Track Charges to SFOs. We feel that this would bring benefits to the relationship between Network Rail as landlord and Station Facility Owner train operators, by better facilitating a portfolio level approach in a manner which limits the level of revision needed to existing contracts.

We propose that beneficiaries are not re-billed for these costs by the SFO, rather that the costs are paid for by the SFO only. This will mean that open access operators will not contribute towards station long term costs, and additionally there will need to be a rebalancing exercise between operators.

In estimating our revenue requirement for CP4, we will forecast our maintenance and renewal costs for stations using the Infrastructure Cost Model (ICM). These costs will therefore be included in the Fixed Track Charges when these published. The addition to the fixed charge will be calculated in the ICM as follows:

- Franchised station long term costs and income will be allocated to the relevant SFO.
- Managed station long term costs and income will be allocated between operators according to a suitable traffic metric, train or vehicle miles.
- We will capitalise renewal and enhancement costs as usual in our assumptions.
- Charges will be disaggregated by England & Wales and Scotland, in a manner consistent with the proposed principles in the Fixed Track Charge.

To be clear, the above does not relate to Network Rail's Qualifying Expenditure costs and anticipated income, which will be accounted for in the single till according to established principles.

More disaggregated reporting information will be provided, namely:

- In the main SBP document we have provided cost forecasts for CP4 on planned expenditure at franchised stations (see Figure 6.11 on page 131 for expenditure projections by element and Appendix 12 on page 215 for expenditure by SFO).
- We will establish increased annual reporting of actual station expenditure as described earlier in this section.

We consider that additional enhancements within a Control Period should be dealt with as outlined above.

ORR charging objectives

We consider that Network Rail's proposal meets the ORR's charging principles, as expressed in its June 2006 document, and which are quoted below:

i) "promote the objectives of [ORR's] duties under section 4 of the Railways Act 1993 and be consistent with the wider objectives of funders";

ORR has specifically highlighted the need to give appropriate signals to funders in relation to stations. Funders require signals in relation to stations when considering whether to open, close or modify stations. Visibility of station costs will provide such signals; it is not necessary to charge on a per station basis in order to achieve this. In fact, charging in this way can result in a clouding of signals rather than clarity due to the various components of the charge and subsequent netting off that takes place. Removing the need for SFOs to rebill charges to beneficiaries will improve efficiency. Provision of separate information about costs will allow greater clarity in this area.

Structure of charges

The proposal is therefore consistent with ORR's section 4 duties, in particular:

- promoting "efficiency and economy on the part of persons providing railway services";
- promoting "the use of the railway network ... and the development of that network, to the greatest extent ... [considered] economically practicable"; and
- enabling "persons providing railway services to plan the future of their businesses with a reasonable degree of assurance".

ii) "incentivise Network Rail, train operators, train manufacturers, rolling stock companies and funders to ensure efficient utilisation and development of the network and the optimisation of whole industry costs";

Again, industry costs will be optimised via a reduction in industry administrative costs associated with billing and subsequent rebilling to beneficiaries.

Provision of information regarding modelled station costs and spend at a portfolio level will facilitate a shift in maintenance, repair and renewal responsibilities, thereby allowing optimisation of whole industry costs.

iii) "not discriminate between users of the network";

LTC is currently only paid by franchised and non-franchised passenger operators. We consider that it is inconsistent for non-franchised passenger operators to contribute towards the costs of maintaining the station (which are essentially fixed costs) where they do not contribute towards the fixed costs associated with maintaining the network.

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

The proposal has the effect of removing a charge and therefore there will be reduced costs associated with billing and subsequent rebilling to beneficiaries and a reduced administrative burden to the industry.

As noted above, provision of information on modelled costs and subsequent reporting in CP4 will provide transparency and clarity. This will be more comprehensible than the current system of charging whereby the charge comprises different components.

v) "be consistent with relevant legislation, including the EU Directive 2001/14/EC";

We consider that the proposal is consistent with relevant legislation.

vi) "reflect the efficient costs caused by use of the infrastructure (to Network Rail or otherwise)"

Efficient station costs of maintaining and renewing stations will be translated into the fixed charge.

vii) "ensure that Network Rail recovers its allowed revenue requirement".

The proposal will meet this objective.

ORR additionally required that we remove the current cross subsidy between track and station charges. We consider that, on balance, our proposal to include costs in Fixed Track Charges together with provision of information for the industry will provide greater benefit. As set out above we believe the proposed approach to charging is consistent with the approach taken with other charges.

Next steps

We will include station long term costs (but not our managed station operating costs) in the Fixed Track Charge when these are published. As noted above though, as train operating companies have expressed concern at this proposal, we believe that further debate is needed within the industry before a final decision is made in this area. We welcome further debate on this issue with the industry via representatives at the Industry Steering Group.

9 Fixed Charge

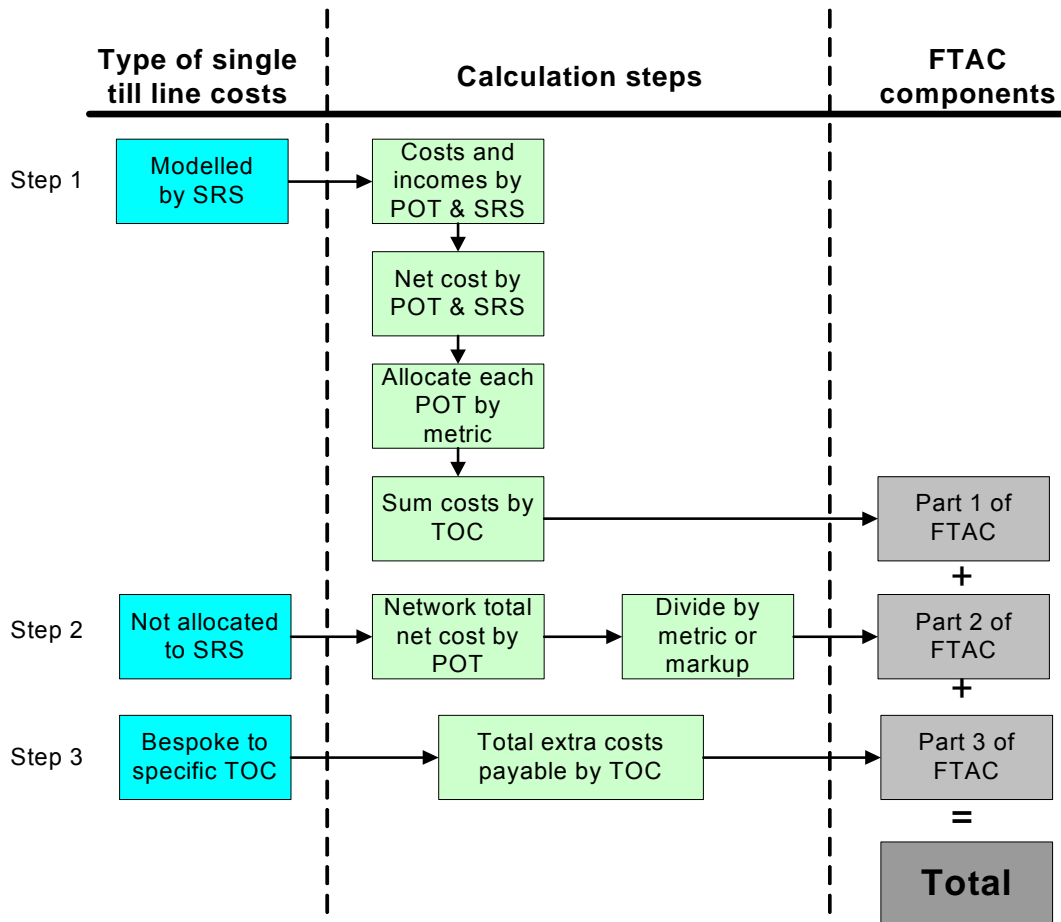
Context & overview

Fixed track-access charges (FTAC) recover the residual net revenue requirement which is calculated as total network costs less government grant and single-till income. Consistent with the general objectives for the structure of charges, ORR is particularly keen for the FTAC approach in CP4 to:

- provide improved cost-reflectivity in terms of the specific costs imposed on the network by operators. This is challenging given the level of fixed and common costs; and
- generate more accurate information to funders.

Our proposed approach builds on the notion of avoidable cost highlighted by ORR and developed by AEA Technology¹⁹. The development of the ICM allows us to identify and allocate costs on a much more disaggregated basis than has been possible in the past – thus meeting the challenge of greater cost-reflectivity.

The following diagram summarises the three levels at which costs are attributed to TOCs. The ICM allows flexibility around the choice of actual allocation metric in light of further analysis and sensitivity testing.



In summary our proposed approach to the calculation of fixed charges is:

¹⁹ See for example the discussion in: <http://www.rail-reg.gov.uk/upload/pdf/291.pdf>

- agreeing the treatment of each component of the calculation of the net revenue requirement, particularly whether it should be covered at SRS level or at a higher level of aggregation²⁰;
- using the ICM to calculate, or allocate, the relevant costs or income to each of the c.300 SRS;
- using the most relevant traffic metrics (e.g. train miles, vehicle miles, tonne miles, electrified train miles etc) to divide each line item between the operators using, or forecast to use, that segment;
- using appropriate metrics to allocate line items not linked to individual SRS, which could use the traffic metrics or distribute pro rata to the SRS-specific estimates;
- identifying any elements that should be ring-fenced to specific TOCs, e.g. related to enhancement deals; and
- summing the components for each TOC.

Analysis & discussion

There are two further issues to resolve around:

- how to make the FTAC allocation process consistent with the principles underpinning devolution of rail responsibilities; and
- the treatment of 'increments and decrements' specified by PTEs.

We address each of these in turn below.

Treatment of Scotland and England / Wales costs

The devolution of responsibilities outlined in the *Future of Rail* White Paper in 2005 clearly set out that Scottish Parliament would be responsible for the costs of the rail infrastructure in Scotland, and that the Department for Transport would be responsible for the costs of rail infrastructure in England and Wales.

This was reflected in the financial settlement agreed between the two governments and in the ORR document that set out its conclusions on the approach to regulation in Scotland²¹. The complication arises because FTAC is paid by franchised TOCs, and the franchise operations of certain TOCs cover both Scotland and England / Wales though the franchising body is either DfT or Transport Scotland.

Without an adjustment, there is the risk that either some of the England / Wales costs are paid by the Scottish Government, or vice-versa.

There are two options to deal with this:

- Fixed costs are charged to TOCs based on where they operate. That is, some of the Scotland costs would be allocated to the East and West Coast Main Line franchisees, and some of the England/Wales costs would be allocated to the ScotRail franchisee.
- Fixed costs are allocated to franchisees within the relevant geographic zone. That is, all fixed costs in Scotland would be allocated to the ScotRail franchisee and all fixed costs in England/Wales are allocated to the franchise operators funded by the DfT.

The first of these options would involve complicated pass-through or remittance arrangements in order to preserve the principle of geographic funding being paid for by the relevant Government.

²⁰ One of the key levels of disaggregation in the ICM is the 300 Strategic Route Sections.

²¹ ORR's approach to regulation in Scotland: Conclusions, Office of Rail Regulation, December 2005. Web link: <http://www.rail-reg.gov.uk/upload/pdf/267.pdf>

We favour the second option, as this is simpler and can be achieved by amending the allocation rules within the ICM and is consistent with the funding split agreed by the two governments.

Increments and decrements

Fixed track access charges (FTAC) for Control Period 4 (CP4) will be calculated using assumptions about forecast usage patterns throughout the Control Period. This begs questions as to:

- What changes would give rise to recalculations of the fixed charge?
- On what basis would any recalculation be made? What are the relevant procedural and methodological issues?

We have discussed our proposed approach at a stakeholder workshop facilitated by ORR on 20 July 2007.

Full details of the issues being addressed are contained within that document. In summary, the key points include the following.

The discussion of increments and decrements was first raised in the Government's Future of Rail White Paper (July 2004). The idea is to provide greater flexibility to PTEs so that where they specify service modifications – particularly decrements – any consequent savings can be devoted to alternate uses.

We have noted elsewhere that franchise remapping is likely to lead to a recalculation of the fixed charge.

The treatment of increments and decrements we have proposed relies on case-by-case assessment according to a defined methodology. For increments, this methodology is the *Investment Framework Policy* that ORR has set out in a number of documents and which continues to evolve. For decrements a preliminary estimate using unit rates would need to be supplemented by extensive assessment at the local level. The basic principle is the change in costs as a consequence of a scheme – this ensures symmetry of treatment between increments and decrements.

Major cost savings from decrements are most likely where there is a permanent cessation of services or a change of mode of operation (for example: heavy to light rail). Even in such instances there may be a time delay before the benefits are felt – this is likely to depend on the current condition of the asset and the timing of future renewal. Timing is further influenced by regulatory requirements and other restrictions that need to be addressed.

Where decrements are specified, any cash rebate paid by Network Rail to the franchised TOCs will reflect the actual funding received – which will only be until the end of the relevant Control Period. This is likely to be small in terms of the long-term impact. This reinforces the importance of the administrative arrangements between the franchised TOCs, DfT and the PTEs in order to capture the whole-life project impacts.

Charging proposal

Our SBP outlines our total revenue requirement and identifies the amount to be recovered through FTAC – making assumptions about the level of government grant. Our next step is to calculate the FTAC for each franchised TOC in line with the principles set out in this chapter. In the absence of further information about the government grant we will present scenarios and our suggestions for how this could be treated most appropriately.

We anticipate completing this analysis shortly.

10 Reservation charge

ORR is responsible for considering the issues around a reservation charge as it would be a new charge. ORR released a consultation document in December 2006. Full information for interested parties is contained in this document.

A reservation charge is payable for the reservation of capacity – either at the time of securing a right or at the time of securing a path in the timetable. It is designed to provide a financial incentive to encourage the efficient holding of rights. The extent to which a reservation charge is appropriate depends on:

- the size of the problem – i.e. the extent to which there is evidence that the existing pattern of the holding of rights is precluding others from running services; and
- whether other existing mechanisms are successfully addressing the underlying issues.

It is understood that ORR will set out further views on this subject shortly.

Table 10 Further information

DOCUMENT NAME	DESCRIPTION	LINK / LOCATION
Office of Rail Regulation (December 2006) <i>Periodic Review 2008 - A Reservation Charge: Consultation on Issues and Options</i>	<p>Seeking stakeholder input in relation to issues. Set out three key questions:</p> <ul style="list-style-type: none"> • whether there is evidence of operators holding a significant number of unused rights; • whether those rights have an opportunity cost; and • if so, whether the problem can be addressed effectively through other mechanisms. 	http://www.rail-reg.gov.uk/upload/pdf/311.pdf

11 Concluding remarks

We have developed a set of indicative tariffs that are substantially more cost-reflective than current charges. We believe they meet the objectives ORR has set for us. The improvements have been on the back of the development of the ICM and sophisticated work to review and update other charges such as the variable usage and capacity charges.

Variable usage charges are relatively small but an important part of the suite of signals. They will impact on manufacturers, funders and operators – we believe that the response of stakeholders to the new signals will be important in driving efficient network development.

The charges we have set out are indicative and we invite feedback on any aspect of our proposals. In some instances particularly we have proposed options and would welcome stakeholder input to guide our decision. We will complete further work to calculate the actual FTAC by franchised TOCs in the near future. We will also be sharing any further updates to our indicative charges.

Stakeholder responses should be sent to:

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