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OFFICE OF **RAIL REGULATION**

19 January 2007

Mr Bill Reeve
Director of Rail Delivery
Transport Scotland
Buchanan House
58 Port Dundas Road
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Dear Bill

Track access charges on the Stirling – Alloa – Kincardine route

Introduction

You have asked us to clarify the basis on which we would expect to approve (or if agreement cannot be reached, direct) track access charges payable by freight operators using the Alloa – Kincardine section of the Stirling – Alloa – Kincardine (SAK) route.

In essence, the track access charge needs:

- to be consistent with the access and management regulations[1];
- not to exceed the share of project costs (including a reasonable rate of return) attributable to rail freight operators; and
- to be non-discriminatory between different freight operators using the route.

An important consideration is that freight operators' existing access rights to use the alternative route via the Forth Bridge are unaffected by construction of the new route. Freight operators cannot be forced to use the new route and they will clearly be reluctant to do so if the proposed charge exceeds the benefits to them.

[1] Railways infrastructure (access and management) regulations 2005 (2005/3049).

Recovering costs from the investment project

Where an enhancement to the network takes place, leading to an increase in its capability, capacity and/or functionality, it is reasonable for the infrastructure manager to be able to seek to recover the incremental costs associated with the enhancement from train operators wishing to use and benefiting from the enhanced part of the network. Network Rail can recover these costs through track access charges in passenger and/or freight operators' track access contracts. In practice, we would expect train operators to pay two separate charges:

- a standard variable charge according to a published price list to reflect the on-going wear and tear on the new/enhanced assets; and
- an additional charge to recover the capital costs, including a reasonable rate of return, and any forward looking costs (not recovered through the variable charge) associated with maintaining and renewing the new assets.

This approach is consistent with our published investment framework and has been previously applied in track access contracts.

Freight operators' track access contracts already contain provisions for charges (over and above variable charges) to be levied to recover the costs of small-scale enhancements. A maximum of £250,000 per year can be charged without regulatory approval. For larger enhancement projects Network Rail and freight operators can negotiate annual charges which exceed £250,000 but these require regulatory approval.

In considering whether to approve charges related to enhancement projects (or direct Network Rail where agreement is not reached), we would need to be satisfied that they:

- do not exceed the efficient freight-related cost of the investment, including a reasonable rate of return (which can reflect risks taken by the funder, including volume risk);
- exclude investment costs met by others (e.g. passenger train operators); and
- be consistent with the access and management regulations (see below).

These principles determine the maximum charges that we would approve or direct in an access contract. Within these principles, in order to encourage use of the new route, a negotiated charge between Network Rail and freight operators reflecting the net benefits to operators, would be permissible. This would reflect the fact that there is an alternative

route (albeit considerably longer than the new route with a lower capability) which operators can continue to use if they deem the charge for the new route to be too high.

Once established, the charge will need to be payable by all freight operators using the route on a non-discriminatory basis.

Indicative charge

You have provided a paper setting out a proposed method for calculating the access charges applicable to freight operators who use the new route. I have attached that paper at Annex A to this letter. The method appears to be consistent with the principles described above. Applying the assumptions you have made in the paper[2], an indicative maximum access charge for the route is shown in the table below. This variable charge per tonne would need to apply to any freight operator using the route.

Charges for the "Central case" scenario	**Indicative access charge per tonne (in mid-2006 prices)**
Unadjusted Cost based charge	£1.57
Adjusted to take account of expected savings to freight and to reflect freight attributable costs only	£1.02
Maximum indicative charge (adjusted for wider benefits)	£0.90

Importantly though, before we can approve or direct a charge for use of the new route, you will need to provide us with information on how the conditions in the access and management regulations have been satisfied.

The access and management regulations

The access and management regulations allow the infrastructure manager (Network Rail) to recover the costs of enhancement projects. Specifically, the regulations allow Network

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[2] We have not audited the assumptions you have made, for instance the assumptions underpinning the Strategic Rail Authority's Freight Train Operating Cost Model.

Rail to 'set or continue to set higher charges on the basis of the long-term costs of the project'[3]. This is subject to both the following conditions:

- 'the effect of the higher charges must be to increase the efficiency or cost-effectiveness of the project; and
- it must be the case that the project could not otherwise have been undertaken without the prospect of such higher charges'[4].

Next steps

Any charges agreed with train operators will need to be included with other required changes to track access contracts that allow access to the new route.

Any such change to track access contracts is subject to our approval. At that stage we will consider the specific charge proposed in accordance with the principles set out above.

If you have any queries on this please contact Jon Clyne on (020) 7282 2104 or myself.

I am copying this letter to Paul Plummer at Network Rail and to Graham Smith, Chairman and Lindsay Durham, Secretary, of the Rail Freight Operators Association. I am also publishing it on our website.

Yours sincerely

John Thomas

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[3] Schedule 3 paragraph 1.

[4] Schedule 3 paragraph 2.

Annex A: Transport Scotland paper on variable access charges for Alloa-Kincardine

Introduction

Transport Scotland is promoting, through Clackmannanshire Council, the reopening of the railway line between Stirling, Alloa and Kincardine. Between Stirling and Alloa the railway is a mixed-traffic railway capable of handling passenger and freight trains. Between Alloa and Kincardine the railway is intended solely for the use of coal trains destined for Scottish Power's facility at Longannet. Though not impossible that marginal use may be made by some other freight flows, no such traffic has been identified.

The capital costs of construction are being funded through the public sector. This is principally a consequence of the misalignment of incentives for long- and short-term funding implicit within the freight access charging settlement (put in place by ORR in 2001). When the project was developed, the future of Longannet beyond 2015 was unclear. In this context, the private sector would not have regarded the project as viable given commercial rates of return, the demand forecast risk, and a very short period to earn a return on capital. The public sector, at this time, assumed these risks, as well as the construction cost risk, and thus expects an access charging regime that recovers some of the costs of capital from users of the route as well as an appropriate balance of risk and reward for funders and operators.

The absence of clarity about access charging regimes for new freight infrastructure is acting as a strong disincentive for further investments.

This paper presents the results of an exercise to determine a suitable mechanism with which to recharge public funding through access charges in the context of the Stirling-Alloa-Kincardine (SAK) project. It is assumed that the charge is based around tonnes moved over the section of route between Alloa and Kincardine.

The paper proceeds by taking the charge per tonne approach as a starting point. It focuses upon coal traffic only and does not consider any traffic induced as a consequence of the SAK line reopening. With this in mind, the remainder of this paper is as follows:

- Section 2 describes the present coal haulage situation.
- Section 3 estimates the supplementary charge required to recover total capital costs.
- Section 4 models freight operating costs before and after the construction of SAK.
- Section 5 adjusts for freight-dependent external benefits.
- Section 6 draws together the previous evidence and recommends an appropriate charge.

Background

Longannet Power Station relies upon coal imported through the deep water port at Hunterston in Ayrshire. The coal is currently moved by a variety of routes across Central Scotland, but currently reaches Longannet via the Forth Bridge, a locomotive run-round at Charleston near Dunfermline, and finally into Longannet along the coast from the east. The reopening of the SAK railway and its connection to the existing Longannet branch line will have significant beneficial operational impacts upon the supply of coal to Longannet.

It is assumed that at least 20 million tonnes of coal will be transported by rail over seven years (source – Clydeport). This translates to approximately 2.8m tonnes per annum and is broadly in line with the 2m tonnes per annum assumed by MVA in the document *Stirling-Alloa-Kincardine Rail Line Reopening Benefit Study.* It is possible that more (up to 4 mtpa) or, if Longannet Power Station closes, less (0 mtpa) could move.

Cost Determined Charge

A crude approach to calculate an appropriate supplementary charge would simply be to recover the NPV of total project costs[5]. The project costs are anticipated to be within the range £65m to £70m, however, this paper uses the conservative figure of £65.8m[1] in its calculations as this was the best estimate of the project's outturn cost at the time of writing. Whilst this figure includes a £2.5m contribution from Clackmannanshire Council, consideration of an appropriate rebate mechanism is beyond the scope of this paper and hence the distinction will be ignored.

[5] Since the route is a mixed-use line it would be preferable to disaggregate only freight attributable cost. Unfortunately this is not possible with the evidence available at present.

Assuming that the project costs are recovered over the projected lifetime of Longannet Power Station, and using the appropriate Green Book discount rates of 3.5% (years 1-30) and 3.0% (years 31-60) the £65.8m total project cost can be converted into the appropriate charge required per annum[6]. Table 1 presents the supplementary charge per tonne required to recover total project costs under four alternative scenarios described below.

- Worst case: Longannet Power station is assumed to close in 2020
- Central case: As described above, 2.8m tonnes of coal delivered per annum over 20 years
- Upper case: Demand for rail-borne coal increased to capacity of Longannet Power Station (approx 4 mtpa) over 20 years
- Optimistic case: Demand for coal freight increased to 4mtpa and substituted for other freight (post-Longannet) over the recommended 60 year appraisal period.

	Charge per annum	**Tonnes per annum**	**Charge per tonne**
Worst case	£5.71m	2,857,000	£2.00
Central case	£4.48m	2,857,000	£1.57
Upper case	£4.48m	4,000,000	£1.12
Optimistic case	£2.59m	4,000,000	£0.65

Table 1: Supplementary charges required to recover total project costs (2006 prices)

Despite relying upon fragile assumptions (flat demand profile, flat payment schedule etc.) this approach provides a useful starting point. Since total costs of construction have been

[6] All monetary values in this paper are 2006 prices unless labelled otherwise.

used instead of solely those for the freight-only route section, these figures can be considered as an upper-bound for supplementary access charges on the route.

Ability to pay

The main drawback of the approach presented above is that it does not take into account the ability of freight operators to pay these access charges. Assuming that freight operators do not behave tactically, the maximum amount they would be willing to pay for access to the SAK line would be equivalent to the cost savings relative to the do-nothing scenario. The reopening of the SAK railway creates the opportunity to reduce the cost of transporting coal to Longannet by three principal mechanisms:

- Reducing the round-trip distance
- Enabling economies of scale (through higher route availability, loading gauge and elimination of train length restrictions over the Forth Bridge)
- Improved use of capital equipment

In addition to the decrease in cost of operation for existing tonneages, it allows the scale of the business to be increased. The current rail borne deliveries are at or near the capacity of the existing rail infrastructure. The new infrastructure would permit all of Longannet Power Station's capacity (approx. 4mtpa) to be supplied by rail.

Other things being equal, these imply that freight operators using the route will receive significant windfall gains that are not captured through extending the current variable access charging regime. In order to assess the magnitude of these gains it is necessary to model the haulage costs before and after the construction of SAK. Table 2 describes both the existing operating assumptions and the potential for future operations using the new line as outlined in the document *Freight Operations Cost Estimates: Technical Note* produced by TiE Ltd and amended to take into account recent relaxation of Forth Bridge weight limits.

	Current	Future
Distance (round trip)	212 miles	180 miles
Axle weight limit	22.86 tonnes	25.4 tonnes
Locomotive	Class 66	Class 66
Wagon type	HAA	HTA
Number of wagons	38	21
Gross laden weight (per wagon)	47.5 tonnes	102 tonnes
Payload (per wagon)	32.5 tonnes	76 tonnes
Maximum net tonneage per train	1235 tonnes	1596 tonnes
Maximum daily trips (per train)	1.5	2
Operational days per week	6	6

Table 2: Operating assumptions

Source: *Freight Operations Cost Estimates: Technical Note (TiOE Ltd.)*

Updated following relaxation of Forth Bridge weight limits by Network Rail

It should be noted that in conjunction with the revised Forth Bridge limits permitted by Network Rail, EWS are trialling longer trains in Scotland. Were the previous gross trailing weight limit of 1440 tonnes per train binding, only trains with a maximum of 30 wagons would be permitted. The impact of this restriction is illustrated in the following section.

Using the assumptions presented in table 2 it is possible to estimate the costs per tonne of coal transported before and after SAK reopening. This task has already been carried out by TIE Ltd. using a bespoke pricing model[7]. The results of this exercise are presented in the document *Stirling-Alloa-Kincardine Railway Project. Freight Operations Cost Estimates: Technical Note* and the accompanying note *Stirling-Alloa-Kincardine Freight Savings Options Summary.* This exercise estimated that the costs per tonne of coal transported were:

	Weight limit relaxed	Weight limit binding
Forth Bridge Route:	£3.10	£3.43
SAK Route	£1.89	£1.89
Saving generated:	**£1.21 per tonne**	**£1.54 per tonne**

Table 3: Savings per tonne generated according to bespoke TiE pricing model

In order to verify the figures produced by TIE it has been possible to compare them against output from the SRA Freight Train Operating Cost Model. This model was developed by the SRA Freight team, has well-documented data sources[8] and has been subject to an independent review/validation exercise performed by Symonds Ltd. Using the input data/assumptions provided in table 2, and with all other variables at their default settings, the SRA Freight Train Operating Cost Model estimated the costs per tonne of coal transported as:

[7] For a full exposition of the model and a description of the additional operating cost assumptions used see *Stirling-Alloa-Kincardine Railway Project. Freight Operations Cost Estimates: Technical Note*

[8] *SRA Freight Train Operating Cost Model Reference Manual (April 2005)*

	Weight limit relaxed	Weight limit binding
Forth Bridge Route:	£4.12	£4.45
SAK Route	£2.84	£2.84
Saving generated:	**£1.28 per tonne**	**£1.61 per tonne**

Table 4: Savings per tonne generated according to SRA Freight Train Operating Cost Model

It should be noted that this model has not been shared with ORR and the freight industry. These estimates are included to support the ranges from the more disaggregate approach outlined in 4.2 above using the bespoke TiE cost model for this project.

From the results presented above it is evident that whilst there are some discrepancies[9] between the two models, the estimated cost saving per tonne is very similar (within ± 5%). Such consistency lends support to the TiE model outputs.

It should be noted that both models estimate cost savings on the basis of a representative journey and do not take into account the number of trips undertaken. Whilst the costs of acquiring additional wagons (in excess of those acquired through routine asset renewal and replacement) are ignored, further cost savings per delivered tonne of coal will accrue from the higher asset utilisation.

Using the SRA model to perform sensitivity analysis we can examine how cost savings are affected by changes in operating assumptions. Table 5 presents the estimated cost savings generated under representative operating assumptions[10] for the four scenarios described previously:

[9] There are two main sources for these discrepancies. Firstly, the SRA model captures a much broader spectrum of overhead costs and, secondly, drivers are paid 33% more than in the TIE model.

[10] These operating assumptions are for illustrative purposes only and should not be used out of context.

- Worst case: As in column 2 of table 2 but using the new route i.e. 180 miles
- Central case: As in column 3 of table 2
- Upper case: As in column 3 of table 2 but using 23 HTA wagons
- Optimistic case: Same as above since cost savings are calculated on 'per train' basis. Note that this assumes the same train formation will be retained for transporting the induced freight demand

	Cost per tonne of coal transported		Saving per tonne of coal transported
	Forth bridge route[11]	SAK route	
Worst case	£4.12	£3.80	£0.32
Central case	£4.12	£2.84	£1.28
Upper case	£4.12	£2.78	£1.34
Optimistic case	£4.12	£2.77	£1.34

Table 5: Estimated cost savings available under alternative operating/demand assumptions (2006 prices)

The results provided in table 5 highlight the sensitivity of potential cost savings to the operating assumptions used.

Adjustment for external benefits

The final stage in the estimation of appropriate access charges for the route is to consider the net positive external benefits generated from the re-routeing of freight traffic via the new line and which the public sector has a legitimate locus in contributing towards. Additional paths over the Forth Bridge and the re-routeing of freight traffic will release

[11] Note that we have assumed the gross trailing weight limit is not binding to ensure consistency with table 2

performance/capacity elsewhere on the network and therefore contribute towards modal shift. There are also likely to be modest environmental benefits.

Such impacts were assessed in the report *Stirling-Alloa-Kincardine Rail Line Reopening Benefit Study* prepared by MVA on behalf of Scottish Enterprise Forth Valley. As mentioned in paragraph 2.2, these estimates are based upon different traffic assumptions than used in the operating cost modelling exercise above. Since the net external benefits are positively correlated with the underlying traffic figures it has been necessary to adjust accordingly. Furthermore, as the assessment of benefits was undertaken using the old Green Book methodology, it has been necessary to update these estimates to reflect current appraisal guidelines.

Performing the necessary adjustments to the external freight-dependent benefits as quantified in the MVA report provides the following:

	External benefits per tonne of coal	**NPV (60yr) of external benefits**			
		Worst	**Central**	**Upper**	**Optimistic**
Network reliability improvements	£0.104	£3.43m	£4.23m	£5.93m	£10.58m
VOC savings (passenger)	£0.011	£0.35m	£0.43m	£0.60m	£1.07m
VOC savings (road freight)	<£0.001	£0.001m	£0.002m	£0.002m	£0.004m
Total external benefits	**£0.1154**	**£3.80m**	**£4.69m**	**£6.56m**	**£11.71m**

Table 6: Quantifiable freight-dependent external benefits (2006 prices)

Note: Totals may differ due to rounding

Whilst in reality we would expect to see diminishing marginal external benefits, in the absence of any further information it has been assumed that the external benefits are directly proportional to the amount of traffic using the new route. It is therefore possible to translate the total external benefits reported in table 6 to an average benefit of approximately **£0.12 per tonne**.

There are also likely to be a number of unquantifiable external benefits. These will include an increase in noise and vibration levels along the new route, a slight reduction in the number of road accidents, and a small increase in community severance. Both individually and at an aggregate level the net impact of these factors is likely to be small. More detail can be obtained from the MVA final report.

Recommendation

The most significant feature of the analysis above is that (in the central case) the cost saving for coal transported via the new route (£1.28/tonne) is less than the supplementary charge required to recover total project costs (£1.57/tonne). Alternatively, in the upper case it should be noted that the cost saving for coal transported via the new route (1.34/tonne) is greater than the supplementary charge required to recover total project costs (£1.12/tonne) In each case, the smaller of the two figures must be binding.

In order to reach a final charge per tonne a number of adjustments need to be made to the figures above. Firstly, the calculations carried out will need to be verified once the final outturn cost of the project is known. Secondly, as mentioned in footnote 1, this value was calculated on the basis of total project costs rather than freight-attributable costs only. A reasonable allocation is that freight-attributable costs constitute 80% of total project costs (all of the cost of the freight only section plus a significant proportion of the mixed traffic section, driven by the more expensive infrastructure specification needed for heavy freight trains). This reduces the recommended supplementary access charge to between £0.90 and £1.02 per tonne of coal. Thirdly, it is necessary to adjust for the quantifiable external benefits identified in table 6. This reduces the recommended supplementary access charge by a further £0.12 per tonne. However, the allocation of risk between public and private funders of the route and the requirement to secure funding for potential future freight projects would suggest that the public funder should be rewarded for upside risk, and that around £0.80-£0.90 per tonne would represent an appropriate and equitable charge for the use of the new infrastructure.

A number of factors might influence the level of access charges further:

- Traffic forecasts – this estimate is based upon between 2.8m or 4m tonnes of coal traffic per annum over 20 years. As mentioned in paragraph 1.2 it does not take into account additional/induced traffic. Performing the necessary adjustments using the optimistic scenario (4mtpa over 60 years) generates a supplementary charge per tonne of £0.40.

- External benefits – only those external benefits quantified by MVA were included. In particular, environmental benefits were ignored. Subsequent improvements in appraisal methodology now enable us to quantify a wider range of impacts.

- Acquisition costs – this analysis does not take into account those costs for additional wagons over and above routine asset renewal and replacement. These are likely to be small.