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Dear colleague

### **Schedule 8 compensation payment rates in Control Period 5**

ORR is currently undertaking its periodic review (PR13), which will set the outputs and funding for Network Rail for Control Period 5 (CP5). As part of this process, the industry is reviewing the parameters of the Schedule 8 regime, which provides compensation for unplanned disruption.

Central to the successful functioning of the Schedule 8 regime are the 'payment rates', which govern the size of payments which operators make to Network Rail when performance is above target, reflecting increased operator revenue. They also determine the payments made by Network Rail to train operators to compensate them for lost passenger revenues during times of below-target performance.

The purpose of this letter is to consult with the industry about some important issues around Schedule 8 payment rates, especially in relation to commuting services in London and the South East.

### **The importance of getting Schedule 8 payment rates 'right'**

We wrote to the industry in November 2012 to emphasise the importance of ensuring that Schedule 8 payment rates are set so that they accurately reflect the impact of performance on farebox revenue. Equally importantly, Schedule 4 and the Capacity Charge also require that Schedule 8 payment rates are set at the 'right' level if they are to fulfil their objectives, since they are calibrated directly on payment rates set in Schedule 8. This important issue has been discussed at the Rail Delivery Group (RDG), together with the RDG working group on regulatory and contractual reform. In December 2012, we held a workshop at Kings Place aimed at demonstrating the importance of getting payment rates 'right'.



At the workshop, we sought to demonstrate how setting payment rates at the 'correct' level would minimise financial risk, particularly to train operating companies (TOCs). We illustrated how payment rates that are either 'too low' or 'too high' would lead to higher TOC and Network Rail income volatility. The issue around financial risk is particularly important given that **Schedule 8 benchmarks have not yet been set for CP5**. This means that it is not possible to make a confident assessment as to whether Network Rail and/or TOC performance will be 'above' or 'below' benchmark in CP5 for a given TOC and/or service group, and therefore judge the likely 'direction' of financial flows under Schedule 8.

Through various fora, we have also emphasised that setting payment rates correctly is very important in respect of providing TOCs and Network Rail with the correct incentives and price signals. For example, inaccurate payment rates could signal to Network Rail an inappropriate balance to be struck between the performance provided to different operators. Similarly, incorrect payment rates could direct Network Rail towards incorrect choices when making the trade-off between performance and efficiency or performance and capacity utilisation.

We have also raised concerns about the reputational risk to the industry of setting Schedule 8 payment rates in CP5 at inappropriate levels. Schedule 8 payments in particular have drawn significant media and political attention, and the scale of payments has attracted criticism. We consider that it is in the industry's collective interest to guard against establishing payment rates that are not 'right'.

We recognise that the pass-through arrangements in franchises may mean that this has limited impact on operators under the terms of some existing franchises. However, this would impact directly on the risks and incentives operating under new franchises.

### **Work to date on setting Schedule 8 payment rates for CP5**

Since privatisation, payment rates have been set using the methodology in the Passenger Demand Forecasting Handbook (PDFH)<sup>1</sup>. Specifically, the calculation of the rates uses two key sets of parameters from the PDFH:

- **"Lateness Multipliers"** (also called "delay multipliers"), which reflect the value put on one minute of average lateness relative to one minute of timetabled journey time; and
- **"GJT elasticities"**, which measure the sensitivity of rail demand to changes in Generalised Journey Time (GJT).

<sup>1</sup> To be precise, this is how the MRE (Marginal Revenue Effect) component of rates has been set; before 2004, the Schedule 8 payment rate for many service groups also included a "societal rate" component.



The current Schedule 8 payment rates are, for almost all services, those set in the Review of Performance Regimes in 2005 (and since indexed by RPI in the usual way). The rates were calculated using parameters from version 4.1 of the PDFH, with some adjustments agreed by an industry technical group.

In the current periodic review, the work to update Schedule 8 payment rates for CP5 has been led by consultants Halcrow, with oversight from ORR and Network Rail. Halcrow's work to date has been based on the Lateness Multipliers and GJT elasticities proposed for inclusion in version 5.1 of the PDFH, which is close to being finalised (Halcrow's work also updates the rates for other changes since 2004/2005, most notably the significant increases in real fares revenue since this time).

Version 5.1 of the PDFH includes significant changes in Lateness Multipliers and GJT elasticities. The combined effect of these changes is that, in general, demand is assumed to be significantly more sensitive to train performance than previously thought.

### **Network Rail concerns: London & South East commuting – the evidence base**

The revised payment rates, based on PDFH 5.1, are in general likely to provide the best available estimate of the long term impact of performance on demand, in the absence of any other factors operating to affect demand. However, we are concerned that, for commuting flows into London, the revised rates significantly overstate the sensitivity of passenger demand to variations in performance. Our evidence for this is twofold.

First, the evidence base for the PDFH 5.1 update includes six studies that have attempted to directly measure the effect of train performance on demand. Three of these studies attempted to do so for London and South East commuting. Of these, two<sup>2</sup> were unable to find a statistically significant effect; while the third<sup>3</sup> found that the response of demand to performance was almost negligible (around 10% of the response that would be implied by the PDFH 5.1 Lateness Multipliers and GJT elasticities).

Second, we have undertaken a high level 'back-casting' analysis of London commuting as a whole, covering the period from 1999/2000 to 2010/2011. The analysis compares the level of demand predicted by the PDFH 5.1 parameters, with actual or 'outturn' demand. The analysis takes account of changes to Central London employment and changes in fares. The key results are that:

- During the significant fall in performance (which lasted for several years) following Hatfield, the PDFH 5.1 parameters imply that peak demand should

<sup>2</sup> MVA (2008), Arup / OXERA (2010)

<sup>3</sup> SDG (2003)



have fallen by 10-15 per cent. In practice, demand appears to have fallen by no more than 2-3 per cent (after allowing for changes in employment and fares).

- Similarly, between 2002/2003 and 2007/2008, when London peak PPM increased from around 75 per cent to around 88 per cent, the PDFH 5.1 parameters would predict a rise in demand of around 15 per cent due to the improvement in performance. In practice, demand appears to have increased by no more than 2-3 per cent (after allowing for changes in employment and fares).

Further details of the back-casting analysis are in the annex to this letter.

In practice, therefore, it appears that the sensitivity of demand to changes in performance has been much lower than would be implied by the Lateness Multipliers and GJT elasticities set out in PDFH 5.1. Indeed, it appears to have been lower than would be implied by the parameters used to calculate the *current* Schedule 8 payment rates.

### Interpretation of the evidence base

The key question is: what are the reasons for the “gap” between the (large) predicted effect of performance on London commuting demand, and the (much smaller) observed effect?

One possibility is that the Lateness Multipliers and GJT elasticities, proposed for PDFH 5.1, are too high for this market segment despite the research that underpins them. This may be part of the explanation. But it seems unlikely that this could account for more than a modest proportion of the gap. The scale of the necessary reduction (in the Lateness Multipliers and/or GJT elasticities, to account for all or most of the gap) would not be credible.

It therefore seems likely that the explanation for much of the gap lies not with the Lateness Multipliers or GJT elasticities *per se*, but in other parts of the PDFH framework, as follows:

- **Re-distribution effects.** In the case of London commuting, when demand on one particular route changes in response to changes in performance (or indeed to other changes in the service offered to passengers), part of the long run change in demand will in fact be a re-distribution of passengers from (or to) other routes into London. The PDFH suggests that such re-distribution should be assumed to account for approximately 30% of the observed change in demand on any given route. However, following Hatfield, it is unlikely that such re-distribution would have occurred, as performance first deteriorated



and then recovered on almost all routes into London over the same time period.

- **Time lags.** The GJT elasticities contained in the PDFH are explicitly intended to be long run elasticities, i.e. they represent changes in demand up to the point at which market 'equilibrium' is reached. Indeed, part of the explanation for the higher elasticities in PDFH 5.1 (compared to previous versions of the PDFH) is that the elasticities in previous versions were often not genuine long run elasticities, but only reflected short to medium term effects.

However, for much of the London commuting market, there is little or no effective alternative to rail travel in the short-term, as significant changes in demand can only take place as a result of commuters moving their place of residence or place of work.

It is therefore plausible that time lags account for some of the gap. That is, had the historic changes in performance been sustained for longer than they were (2-3 years in the case of post-Hatfield, before recovery in performance began), further changes in demand would have been observed. Such long lags would be consistent with the observation above, i.e. that in many cases changes in demand would take place only as a result of people moving house or moving their place of work. We note, however, that such lags would be significantly longer than current PDFH recommendations.

- **Crowding.** The GJT elasticities do not take account of the effect of crowding on demand. However, on crowded services, the response of demand to changes in performance (or indeed to changes in other factors) will be reduced. If performance deteriorates, any reduction in demand will reduce crowding levels; this will in turn tend to increase demand, partially offsetting the initial reduction. Similarly, if performance improves, any increase in demand will increase crowding levels; this will in turn tend to reduce demand, partially offsetting the initial increase.

### Implications for Schedule 8 payment rates

If the analysis of the "gap", above, is correct, the next question is: what are the implications for Schedule 8 payment rates for London commuting? Should the rates be based only on the Lateness Multipliers and GJT elasticities in PDFH 5.1? Or should the rates be adjusted downwards in some way to reflect the factors described above?

In our view, the answer depends on the extent to which the various factors, described above, contribute to the gap (see table 1, below).



**Table 1 – Explanation of the ‘gap’ and implications for Schedule 8**

<b>Explanation of the “gap”</b>	<b>Implies a reduction in Schedule 8 rates?</b> <i>(compared to rates based solely on PDFH 5.1 Lateness Multipliers and GJT elasticities)</i>
Lateness multipliers and/or GJT elasticities too high	<b>Yes</b>
Re-distribution effects	<b>No</b> – Schedule 8 rates should reflect the impact on a TOC’s revenue, even if some revenue changes are in fact re-distribution from other operators.
Time lags	<b>Partially</b> – Schedule 8 rates should reflect long run effects on demand, but time lags on the scale implied by the evidence base suggest that at least some reduction, to reflect discounting of future cash flows, would be appropriate.
Crowding	<b>Partially</b> – Schedule 8 rates should take account of factors (such as crowding) that might affect the response of demand to changes in performance. However, in the longer run, the industry aims to provide additional capacity to accommodate peak demand where this is practicable and value for money. The issue is not clear cut.

## Conclusion and Network Rail’s proposal

It seems clear to us that, for London commuter flows, Schedule 8 payment rates based solely on PDFH 5.1 Lateness Multipliers and GJT Elasticities would be too high, i.e. would overstate the actual impact of performance on revenue. As emphasised above, this could lead to inappropriate outcomes such as increased financial risk to TOCs and Network Rail, perverse incentives and industry reputational risk.

Some form of adjustment is therefore needed. In theory, one could seek to adjust the Schedule 8 payment rates (based on PDFH 5.1) by explicitly modelling the effects of the factors above. However, in practice such modelling would be complex and subject to a high level of uncertainty. Although the PDFH gives a framework that could be used for modelling, many of the relevant PDFH parameters are based on limited empirical evidence and/or have a significant margin of error.

**We therefore propose that, for calculating CP5 Schedule 8 payment rates for London commuting flows, the Lateness Multipliers and GJT elasticities should**



not be taken from PDFH 5.1, but should remain unchanged from those used in 2005 to calculate the current rates<sup>4</sup>.

The parameters included in PDFH 5.1, together with our proposed parameters for purposes of Schedule 8 calibration for CP5 for London commuting flows, are shown in Table 2, below.

Table 2 - Proposed parameters for London commuting

	PDFH 5.1		Network Rail proposed	
	GJT elasticities	LMs	GJT elasticities	LMs
<b>Within Greater London</b>	-0.9	2.5	-0.8	2.5
<b>South East to/from London</b>	-1.25	2.5	-0.8 / -0.6 <sup>5</sup>	2.5
<b>Rest of Country to/from London</b>	-1.35	2.5	-0.6	2.5

We believe that this proposal is pragmatic. We have no direct evidence that rates calculated on our proposed basis would be precisely correct. However, we believe that, compared to the alternative of using PDFH 5.1 parameters, it has the following advantages:

- Although it is not clear whether rates calculated on our proposed basis would be precisely right, it does seem clear that rates calculated using PDFH 5.1 parameters would be too high, by a significant margin. It therefore seems very likely that rates calculated on our proposed basis would be more accurate, i.e. closer to the right value.
- Our experience of Schedule 8 in CP4 has not suggested that payments to Network Rail in instances of Network Rail outperformance – or payments to TOCs in cases of Network Rail underperformance – have been ‘too low’ to reflect the revenue effects of performance, for London and South East commuting services. Had there been any evidence that these payment rates had been too low in CP4, we would have expected to see a larger number of requests for changes to payment rates to reflect shortfalls in TOC revenue. However, there have been very few requests for changes in payment rates in CP4 (and those that have been made, have been requests to *reduce* rates),

We cannot see any reason to believe that changing the basis of payment rates (to the PDFH 5.1 parameters) would improve the accuracy of the rates.

<sup>4</sup> In practice, as shown in Table 1, the Lateness Multipliers for London commuting flows in PDFH 5.1 are in any event unchanged from those used in 2005.

<sup>5</sup> A figure of -0.8 was used in 2004-05 for ‘London inners’ (i.e. services operating within the M25, in general) and a figure of -0.6 for ‘London outers’ (i.e. services operating from within the ‘inner’ zone, to further outside London).



Adopting our proposed approach would mean that payment rates for London commuting flows would still be increased in line with real revenue growth since 2004/05 (the base year for the current rates) and for changes in the timetable since this time.

We see these issues with Schedule 8 payment rates as being specific to London commuting. There are no other market segments in which National Rail has such a strong market position. Even for commuting into other major cities, where rail demand is growing strongly, the car still has the largest modal share and is an effective competitor.

We believe that this approach is pragmatic, will reinforce the accuracy of Schedule 8 in CP5, and uphold the integrity of the regime's compensation and incentive properties, together with those of Schedule 4 and the Capacity Charge.

#### Consultation question

Do you agree with Network Rail's proposition above? If you do not agree, please explain your reasons why. Do you propose any other alternatives?

#### Next steps

The closing date for responses to this letter is 11 June 2013. We will also be holding a workshop at Kings Place on 31 May 2013. This will be an open forum in which to discuss the issues raised in this letter. If you would like to attend this workshop, please contact my colleague, Elyse Stoten on 020 3356 9287 or [elyse.stoten@networkrail.co.uk](mailto:elyse.stoten@networkrail.co.uk).

Following this consultation, and having considered the views of industry stakeholders, Network Rail will submit a proposal to ORR in relation to the parameters for setting Schedule 8 payment rates for commuting in London and the South East in CP5. We expect to submit this proposal to ORR in June 2013. ORR will then consider this proposal, and make a decision on the parameters upon which Schedule 8 payment rates for London and South East commuting in CP5 should be set. Table 3, below, sets out our proposed milestones in relation to this work.





**Table 3 – Proposed milestones**

<b>Activity</b>	<b>Date</b>
Network Rail issues consultation letter	14 May 2013
Network Rail workshop on proposal	31 May 2013
Deadline for responses to this consultation	11 June 2013
Network Rail conclusion on consultation	26 June 2013
ORR advise Halcrow of final GJT elasticities and lateness multipliers	10 July 2013
Halcrow provide Network Rail and ORR with final Schedule 8 payment rates	31 July 2013
Network Rail provide ORR with the updated Schedule 4 ACS, Capacity Charge income and FOC payment rate	21 August 2013
Final Schedule 4 ACS, Capacity Charge income and FOC payment rate for financial model	4 September 2013

If you have any questions in the meantime, please contact me using the details above.

Yours faithfully

Joel Strange  
**Senior Regulatory Economist**



## Annex: Back-casting of peak demand into Central London

### Introduction

This annex summarises the high level back-casting exercise that Network Rail has undertaken in respect of peak demand into Central London over the period 1999/2000 to 2010/2011.

In this period, performance of London and South East peak services dropped steeply after Hatfield (2000/2001). Performance stayed poor for several years before gradually increasing back to pre-Hatfield levels (and eventually exceeding them).

The purpose of the back-casting exercise was to estimate to what extent these changes in train performance led to changes in passenger demand, as would be predicted by the methodology used to calibrate Schedule 8 payment rates.

### Methodology

The demand series used in the back-cast is peak entries into central London from 1999/2000 to 2010/2011 (TSGB Table 0106), which is based on the autumn train counts. We have chosen this demand series because it is focused on the market segment of interest (central London commuting); it is publicly available; and because it will have been unaffected by changes in ticket buying patterns during the period (e.g. the introduction of Oyster).

The variables (other than performance) included in the back-cast are:

- **Central London Employment (CLE).** We have used data for calendar Q4 of each year, this being the quarter in which train counts are generally taken (although it makes little difference to the conclusions of the back-cast if year-average data is used instead).
- **Fares.** These are assumed to have moved in line with SRA / DfT fares policy, i.e. RPI-1% to Jan 2003, then RPI+1% from Jan 2004.

Elasticities of demand to CLE and to fares have been taken from the PDFH 5.1 recommendations.

In respect of performance, the back-cast has been carried out on three bases:

- (a) Assuming no effect of performance on demand.



(b) Based on the lateness multipliers and GJT elasticities used in the calculation of the current Schedule 8 payment rates<sup>6</sup>, i.e.:

- a delay multiplier of 2.5, and
- a GJT elasticity of -0.8 *except* for commuting from the “outer” South-East to London, for which a GJT elasticity of -0.6 was used.

(c) Based on lateness multipliers and GJT elasticities proposed for inclusion in PDFH 5.1, i.e.:

- delay multipliers of 2.5 for all commuting flows, and 2.3 for non-commuting flows; and
- GJT elasticities of -0.9 for “Inners” and -1.25 for “Outers”

No lags have been included in the back-cast.

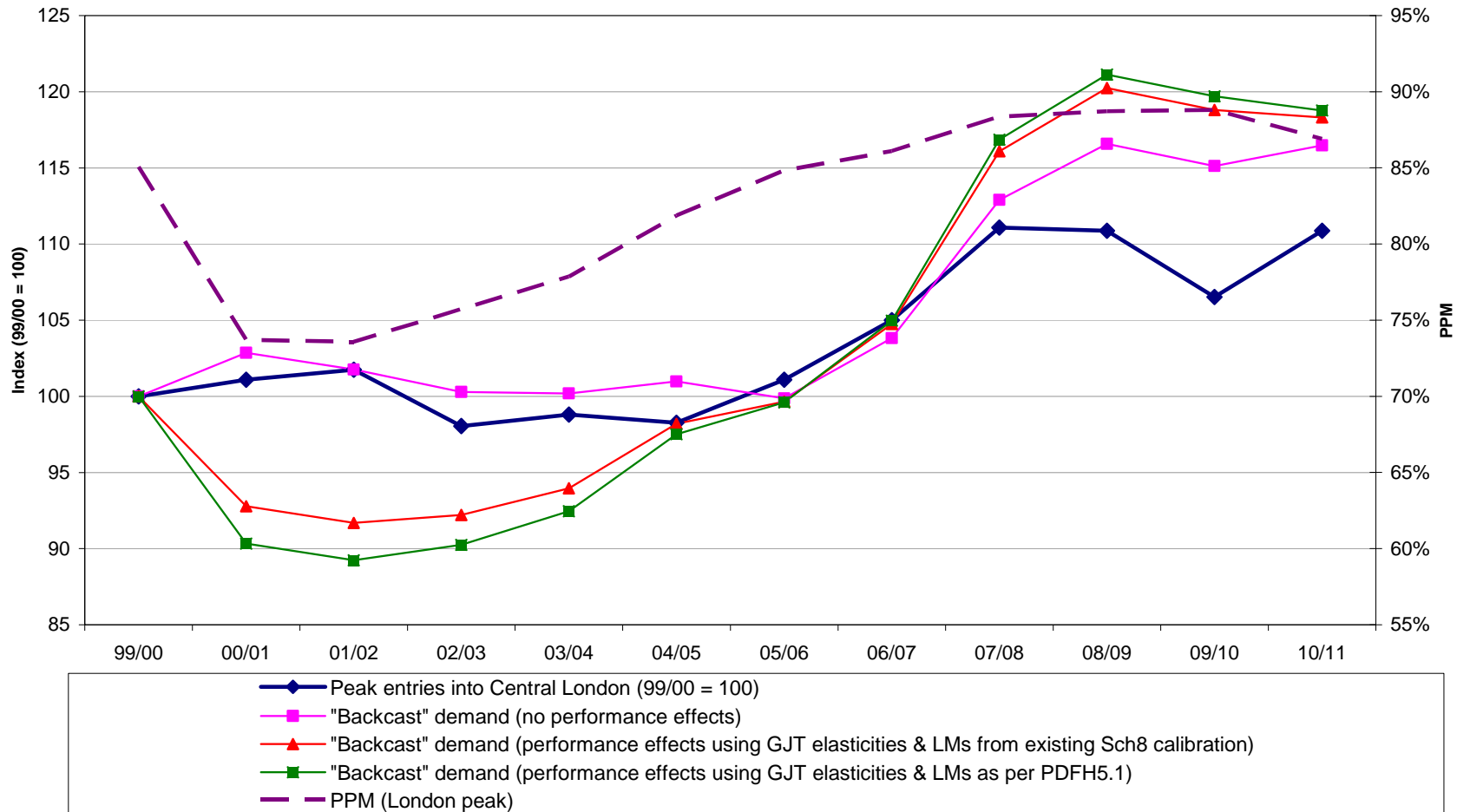
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<sup>6</sup> The Schedule 8 rates were last re-calibrated in 2005, at the same time as PDFH 4.1 was being drafted. The delay multipliers and elasticities used in the re-calibration were largely based on PDFH 4.1, with adjustments as proposed by the industry technical group that advised ORR on the recalibration.



## Results

**Peak demand into Central London**  
**Backcast based on Central London Employment, Fares and Performance**



## Conclusions

The post-Hatfield drop in performance appears to have had little effect on peak demand into Central London, despite the poor performance being sustained for several years and only slowly recovering.

Over the years 2000/2001 to 2004/2005, the chart shows demand being of the order of only 2%-3% below the “no performance effects” back-cast. By comparison, the predicted impact on demand, using the elasticities and lateness multipliers that were used to set the existing Schedule 8 payment rates, would be close to 10%. Using PDFH 5.1 elasticities and lateness multipliers, the predicted impact on demand would be even higher, at 10-15 per cent.

It is possible that the estimated demand effect of 2-3 per cent might be changed slightly if the remaining explanatory variables in the PDFH framework (e.g. GJT, fuel prices) were added into the analysis. However, we do not believe that these would make a significant difference to the overall conclusions, for the following reasons:

- It is not plausible that GJT changes could explain the observed pattern of results. For this to be the case, there would have to have been substantial GJT improvements over 2001 – 2003 (to offset a 10%-15% drop in demand due to performance); and then a substantial deterioration in GJT, of similar magnitude, over the next few years (to offset the recovery in demand as performance improved). We do not believe that this has happened
- The elasticities of demand to other variables in the PDFH framework (e.g. fuel prices, and frequency and journey times of LUL and bus services) are very low for London commuting, so it is hard to see how they could have had a significant effect. (We have checked this in relation to fuel prices, the inclusion of which has very little effect).

We have also considered whether the introduction of the congestion charge in 2003 would have any effect on the analysis. However, the effect of the charge on rail demand would have been small, given the small modal share that the car has in Central London commuting. In any event, any effect on rail demand would work the wrong way in terms of explaining the results of the back-casting. Any increase in demand from 2003 onwards, as a result of the congestion charge, would further reduce the estimated effect of improving performance during the same period.

In summary, therefore, although the analysis is high level, it appears to demonstrate that the effect of performance on demand was substantially less than that predicted by the application of PDFH lateness multipliers and GJT elasticities alone.