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Network Rail

Strategic Business Plan Update

Control Period 4

Estimation of Schedule 4 costs

April 2008

1. Introduction and summary of results

1.1 Scope of this paper

The Strategic Business Plan (SBP) of October 2007 included an allowance of £100m per year for Schedule 4 costs during CP4. The SBP noted that Schedule 4 was under review, and stated that a revised figure would be presented as part of the April 2008 update.

This paper presents Network Rail's revised estimates of Schedule 4 costs for franchised passenger TOCs, and explains the methodology used to derive them. More specifically, the scope of this paper is Schedule 4 costs associated with Maintenance & Renewal activity, or with Emergency Timetables due to external events such as severe weather.

Schedule 4 costs associated with enhancements are treated in the same way as enhancements costs generally in the SBP. Where a proposed enhancement scheme is incremental on a renewal, the "core" plan includes the cost of the renewal element, and the associated renewal volumes, as if no enhancement were to be undertaken. The cost quoted for the enhancement scheme is then the incremental cost, over and above the cost of simple renewal. The Schedule 4 costs in this paper therefore include the costs that would be associated with the renewal element of enhancement schemes¹.

This paper presents two sets of costs: one for the base plan, and another on the assumption that moves towards the "7 day railway" are funded as part of the Periodic Review. This paper also presents Network Rail's suggested disaggregation of Schedule 4 costs into Access Charge Supplements for the franchised TOCs.

1.2 Key periodic review assumptions

As well the 7 day railway, there are several other areas in which decisions yet to be made, as part of the Periodic Review (PR08), will affect Schedule 4 costs during CP4. In order to estimate Schedule 4 costs we have had to make assumptions about these decisions, as follows:

- **Structure of Schedule 4:** we have assumed that the recommendations of the Industry Steering Group (ISG) to ORR are implemented with effect from 1 April 2009.

¹ There are some exceptions to this principle, where enhancement schemes have been developed as integrated schemes to the extent that it is not practicable to separate out the renewal and enhancement components. For such schemes, all costs (including Schedule 4 costs) are included in the enhancement costs; the "core" plan (from which Schedule 4 costs presented in this paper are derived) excludes any corresponding renewal costs or volumes, thus avoiding double counting.

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- **Recalibration of Schedule 8:** we have assumed that Network Rail payment rates are increased in line with increases in TOC revenue between 2004/05 and 2007/08 (but in line with RPI thereafter); and that Network Rail benchmarks are reduced in line with anticipated performance improvement during CP4.
- **Volume of activity during CP4:** we have assumed activity volumes as per the SBP update.

In addition, we have assumed that Virgin West Coast will move to a template Schedule 4 regime in CP4.

If the final conclusions of PR08 differ from these assumptions, or if Virgin West Coast is not on a template Schedule 4 regime in CP4, the Schedule 4 costs in this paper will need to be adjusted accordingly.

1.3 Summary of results

On the assumptions described above, Network Rail's estimates of Schedule 4 costs in CP4 are as follows:

Figure 1: Summary of Schedule 4 costs in CP4

	2009/10	2010/11	2011/12	2012/13	2013/14
Base plan					
England & Wales	196.8	181.5	180.2	153.7	158.5
Scotland	12.6	11.6	11.5	9.8	10.1
Network total	209.3	193.1	191.7	163.5	168.6
"7 day railway" scenario					
England & Wales	196.8	181.2	177.9	151.3	146.7
Scotland	12.6	11.6	11.4	9.7	9.4
Network total	209.3	192.8	189.2	160.9	156.0

All costs in £m, 06/07 prices. Totals may not match due to rounding

Of these costs, approximately £10m per year (across the whole network) relates to Emergency Timetables. The remainder relates to M&R activity.

1.4 Structure of this paper

The remainder of this paper is structured as follows. Section 2 gives an overview of the methodology used to estimate the Schedule 4 costs. The remainder of the paper explains the methodology and results in more detail, as follows:

- Section 3: Revenue loss formula
- Section 4: Negotiated compensation for revenue loss
- Section 5: Cost formula
- Section 6 Negotiated compensation for TOC costs
- Section 7: Efficiency. This comprises two elements:
 - “Notification efficiency”, i.e. notifying more possessions early, thus attracting greater discounts on Schedule 4 payments; and
 - “Access efficiency”, i.e. doing a given amount of work with less disruptive access. This includes consideration of the 7 day railway.
- Section 8: Emergency timetables
- Section 9: Split between England & Wales and Scotland
- Section 10: Calculation of Access Charge Supplements by TOC

The models that have carried out the calculation of expected Schedule 4 costs are being submitted to ORR with this paper. Appendix A to this paper gives a brief overview of each model.

2. Overview of methodology

2.1 Summary of changes to Schedule 4

ISG has recommended changes to the structure of Schedule 4. Under these recommendations, compensation under Schedule 4 can be summarised as follows:

- The “revenue loss formula”, applicable to all Restrictions of Use (ROUs). This will be the same as the current Schedule 4 algorithm, except for adjustments to the Notification Factors (and the knock-on effects of the recalibration of Schedule 8)
- A new “cost formula”, applicable to all ROUs, intended to cover the cost of replacement bus services (net of any savings in the variable costs of running train services)
- For “Type 2” ROUs, defined as ROUs longer than 60 hours (plus bank holidays as appropriate), TOCs will be able to claim for all costs that they have incurred, to the extent that these exceed the cost formula. This may cover bus costs (where the formula has under-estimated the costs of a particular possession) as well as other costs such as extra staff costs and printing of emergency timetables.
- For “Type 3” ROUs, defined as ROUs longer than 120 hours, TOCs will be able to claim for all costs and revenue losses they have incurred, to the extent that these exceed the total of the revenue loss and cost formulae.
- A concept of “Sustained Planned Disruption” (SPD) will be introduced. If, for any service group, the total compensation under the revenue loss formula exceeds a pre-defined percentage of total service group revenue, over either 3 or 7 consecutive periods, then the service group is deemed to be in SPD. The TOC will then be able to claim for all costs and revenue losses (in excess of formulaic compensation) in respect of ROUs during these periods².

2.2 Schedule 4 costs of M&R activity

Figure 2, overleaf, summarises the methodology that Network Rail has used to estimate the Schedule 4 costs of M&R activity in CP4.

² In practice, where a service group is deemed to be in SPD, it is likely to be clear that this has been triggered by a relatively small number of large-scale, highly disruptive possessions. Claims for costs and losses are expected to focus on these possessions, rather than seeking to re-open compensation in respect of all possessions during the periods concerned.

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Figure 2: Summary of methodology (before adjustments for efficiency, WCML issues and Amended Timetables)

	“Type 1” Restrictions of Use (ROUs)	“Type 2” ROUs	“Type 3” ROUs	Sustained Planned Disruption (SPD)
Revenue loss formula (RLF)	<ul style="list-style-type: none"> • Calculate 2006/07 unit costs, i.e. £ of Schedule 4 per unit volume of activity (or per £ of spend). • Adjust for proposed changes to Notification Factors and anticipated recalibration of Schedule 8. • For WCML only, uplift unit costs to reflect lack of WCML data in 2006/07. • Apply unit costs to projected activity volumes (or £ of spend) in CP4. 			
Negotiated compensation for revenue loss	N/A	N/A	Apply a % uplift to RLF, based on: <ul style="list-style-type: none"> • % of total RLF relating to Type 3 possessions and/or periods of Sustained Planned Disruption; and • analysis of differences between the RLF and estimates of actual revenue loss from MOIRA 	
Cost formula	<ul style="list-style-type: none"> • Assume that, in aggregate, the cost formula gives an amount equal to total industry bus costs (net of savings in mileage-related costs) as estimated from data provided by ATOC. • Extrapolate over CP4 pro rata to the RLF 			
Negotiated compensation for costs	N/A	<ul style="list-style-type: none"> • Assume that compensation equals total industry non-bus costs (for the relevant possessions) as estimated from data provided by ATOC. • Extrapolate over CP4 pro rata to the RLF. 		

Note: the only part of the new Schedule 4 for which historic data is available (based on the current Schedule 4) is the revenue loss formula. For the revenue loss formula, it has therefore been possible to derive unit Schedule 4 costs and apply them to projected CP4 activity volumes. This accounts for approximately 85% of the total Schedule 4 cost. For other parts of the new Schedule 4, other approaches have had to be used, as shown above.

2.3 Efficiency

Two types of efficiency have been applied to the M&R-related Schedule 4 costs.

- “Notification Efficiency”. Network Rail already notifies most possessions to TOCs well in advance, attracting the maximum discount within Schedule 4. We have assumed that limited further improvements are made during CP4.
- “Access efficiency”. Network Rail intends to deliver work in CP4 in ways that are less disruptive to train services than is currently the case. For example, modular renewal of S&C will require possessions shorter than the 54 hours that is often taken at present. Some such initiatives are included in our base plan, and these will reduce Schedule 4 costs. The base plan also includes a move to a much less disruptive pattern of possessions on the West Coast Main Line.

Network Rail has proposed that moves towards the “7 day railway” should be funded as part of the Periodic Review. If this proposal is accepted, disruption to train services (and hence Schedule 4 costs) would be further reduced.

Two access efficiency overlays have therefore been developed for Schedule 4 costs, one corresponding to the base plan and the other to the “7 day railway” scenario. The overlays have been taken from the work to establish projections of the Network Availability Measure for CP4³.

2.4 Schedule 4 costs of Emergency Timetables

Under Schedule 4, Network Rail compensates TOCs for emergency timetables imposed for any reason (other than for causes under the TOC’s own control). Emergency timetables are generally imposed due to events external to the railway, such as severe storms, flooding and fires near the railway that affect operations. They may also be imposed as a result of railway-related events such as fires caused by vandalism, or derailments.

These events are infrequent, but it is reasonable to expect them to occur from time to time. It is therefore reasonable for Network Rail to be funded for compensation payable in respect of external events, or incidents caused by other parties. (Network Rail does not seek funding for compensation payable as a result of incidents such as derailments for which it is itself responsible.)

In relation to the Schedule 4 revenue loss formula, the expected cost of such compensation in each year of Schedule 4 has simply been taken as the average

³ The proposed Network Availability Measure for passenger services is based on the Schedule 4 algorithm. Changes in the Network Availability Measure (or more precisely, percentage changes in *unavailability*) can therefore be applied to expected Schedule 4 costs.

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of such compensation over the years 2005/06 to 2007/08 inclusive, adjusted for the proposed changes to notification factors and for recalibration of Schedule 8.

Compensation for Emergency Timetables under the cost formula, and negotiated compensation in respect of both revenue and TOC costs, have been estimated as a percentage of compensation under the revenue loss formula, using the same percentages as Schedule 4 costs relating to M&R activity.

2.5 Split between England & Wales and Scotland

We have estimated that approximately 6% of CP4 Schedule 4 costs relate to Scotland. This includes compensation to all TOCs in respect of M&R activity taking place in Scotland (or Emergency Timetables imposed as a result of events in Scotland).

2.6 Access Charge Supplements

Projected Schedule 4 costs have been disaggregated into indicative Access Charge Supplements (ACSs) for each TOC, as follows:

- For Virgin West Coast, the ACS has been estimated as 75% of the Schedule 4 costs relating to activity on the WCML.
- For all other TOCs, the remaining Schedule 4 costs have been divided pro rata to Schedule 4 payments in 2006/07 (adjusted for changes to notification factors and recalibration of Schedule 8).

We believe that this methodology gives a reasonable indication of a suitable ACS for each TOC. It would be possible to improve the accuracy of the ACSs, but this would be likely to require substantial additional effort. We would therefore like to discuss with ORR the extent to which such effort is justified, given that changes to ACSs in franchised TOCs' track access agreements are (we understand) passed through to funders under Clause 18.1 / Schedule 9 of the relevant franchise agreement.

3. Revenue loss formula

3.1 Unit costs in 2006/07 - principles

The S4CS system records the amount of Schedule 4 compensation paid to each TOC in respect of each possession. The PPS system records the type of work undertaken in each work site within each possession, and in particular the type of work undertaken in the “lead work site”, *i.e.* the work that initially gave rise to the requirement for the possession. By matching data from the two systems for 2006/07, we have estimated unit Schedule 4 costs for each of the M&R activities that cause the vast majority of Schedule 4 costs, as follows:

- For plain line track renewals, unit cost = £ of Schedule 4 per composite km of track renewed⁴
- For S&C renewals, unit cost = £ of Schedule 4 per equivalent S&C unit renewed⁵
- For signalling renewals, unit cost = £ of Schedule 4 per SEU renewed

For electrification and civils renewals, and for maintenance (track and electrification), there is no straightforward measure of volume that can be used to derive a unit cost. We have therefore estimated the £ of Schedule 4 per £m of spend, for each of these activities.

Volumes of track, S&C and signalling renewals have been taken from the 2006/07 annual return. Spend on other activities in 2006/07 has been taken from the Infrastructure Cost Model (ICM).

This gives a single, network-wide unit Schedule 4 cost for each activity (except for WCML – see section 3.5 below). In practice, the unit Schedule 4 costs of an activity vary considerably across the network, both because Schedule 4 payment rates vary between operators and service groups, and because the disruption caused by activity varies according to factors such as the availability of diversionary routes and whether a route is single-line, 2-track or 4-track. However, taken across the whole network and all M&R activities, we believe that the mix between high-cost and low-cost locations will be reasonably stable over time, and so using a single unit Schedule 4 cost per activity is a reasonable approach.

⁴ “Composite km” = km of rail renewed + km of sleepers renewed + km of ballast renewed

⁵ A full renewal of a S&C unit counts as 1 unit of renewal; a partial renewal counts as 0.5 units; and a removal counts as 0.33 units

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3.2 Unit costs in 2006/07 - data issues

There are several practical issues in estimating unit costs in the manner described above. These are:

- Ensuring “matching” of activity volumes and Schedule 4 costs
- Missing “lead work site” data
- Mapping PPS work types to activities
- Matching possessions in S4CS and PPS

Each of these issues is described in more detail below

3.2.1 *Matching of activity volumes and Schedule 4 costs*

In order to derive valid unit costs, it is essential that, as far as possible, the Schedule 4 costs relate to the possessions required to deliver the activity volumes quoted. This raises several points.

First, although the annual return identifies WCRM renewals volumes separately, it does not distinguish between “standalone” renewals and renewals delivered as part of other enhancement schemes. For example, many re-signalling schemes are likely to include at least some element of enhancement, as the re-signalling gives an opportunity to rationalise or improve the track layout.

Second Virgin West Coast (VWC) do not currently have a template Schedule 4 regime, so the S4CS contains no Schedule 4 costs relating to VWC.

In order to ensure matching that is as close as possible between activity volumes and Schedule 4 costs, we have:

- used non-WCRM 2006/07 activity volumes from the Annual Return (and, where applicable, non-WCRM spend from the ICM);
- stripped out from the 2006/07 Schedule 4 costs all possessions relating to WCRM;

(In principle an alternative would have been to include both WCRM activity volumes and corresponding Schedule 4 costs. However, we do not believe that WCRM activity can be taken as representative of M&R activity in general, and in any event the Schedule 4 costs contain no data for VWC. The above approach therefore appears to be the best available.)

A further point relates to the Portsmouth re-signalling scheme, which was planned to deliver 251 SEUs in 2006/07 (about one third of the total for the year). The S4CS data contains Schedule 4 costs relating both to the work as originally planned, and also to the subsequent emergency timetables and re-working of the scheme. The Annual Return shows 401 SEUs delivered during the year. As the scheme represents a substantial proportion of the potential sample data, we have

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added the 251 SEUs to the total quoted in the Annual Return; we have retained in the S4CS data the possessions that were originally planned to deliver the scheme; but we have stripped out all the Schedule 4 costs relating to the overrun and re-working of the scheme.

After all these adjustments, the resulting unit costs are essentially average unit costs across the network as a whole, *excluding* the WCML⁶. We have therefore adjusted the unit costs before applying them to WCML activity volumes in CP4 (see section 3.5 below).

3.2.2 Missing “lead work site” data

We have attributed the Schedule 4 cost of each possession to the type of work being done within the “lead work site” for that possession, as identified in PPS. However, the data on “lead work sites” is not complete in the PPS data; approximately 40% of possessions had a lead work site identified in 2006/07.

For possessions with only a single work site, this is obviously not a problem. But for possessions with multiple work sites, it is not clear what work site should be regarded as the lead work site, and hence to what work type the Schedule 4 cost should be attributed. For such possessions we have spread the Schedule 4 cost between work sites, based on the likelihood of each work site being the lead work site, the likelihood being estimated from the data for possessions for which a lead work site *is* specified.

3.2.3 Mapping PPS work types to activities

PPS contains a large number of detailed work types. In many cases these are clearly sub-types of the activities that we have used in the analysis; for example there are a number of track renewals work types in PPS, depending on exactly what track components are renewed and in what manner.

In some cases, however, it is not clear from the work type in PPS which asset the work relates to, or in some cases whether it relates to maintenance or renewals. (For example, the work type “Move materials” could relate to the maintenance or renewal of any asset). Schedule 4 costs relating to these work types have been attributed to the generic activities of “All maintenance”, “All renewals” or “All M&R work”. These activities account for approximately 10% of M&R-related Schedule 4 costs.

⁶ Some renewal activity, and much of the maintenance activity, on the WCML, was undertaken outside the scope of the WCRM project and is therefore inevitably included in the volumes data. However, although the corresponding possessions will be included in the S4CS data, the data does not contain any payments to VWC (which would generally be most of the Schedule 4 cost). The Schedule 4 costs in respect of these possessions will therefore be as though VWC were not running on the WCML. The unit costs are therefore best characterised as being average unit costs across the whole of the network *except* WCML.

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3.2.4 Matching possessions in S4CS and PPS

A minority of M&R-related possessions (approximately 8% by Schedule 4 value) could not be matched to PPS, owing to the lack of a possession reference in suitable format in S4CS. The Schedule 4 costs of these possessions have been spread over the costs of all activities, pro rata to the costs of the possessions that could be matched.

3.3 Adjustments for changes to notification factors

The 2006/07 Schedule 4 costs have been adjusted for the proposed changes in discount factors as per the ISG recommendations, which are reproduced below:

Figure 3: ISG recommended changes to notification factors

Illustration of notification discount factors	By FWTT	By ITWTT	By ATT
Existing notification factors for a Service Group with delay multiplier 2.5	40% of MRE payable	60% of MRE payable	80% of MRE payable
Proposed new notification factors	55% of MRE payable	70% of MRE payable	85% of MRE payable
Existing notification factors for a Service Group with delay multiplier 5.1 / 6.5	19% / 15% of MRE payable	50% / 48% of MRE payable	80% / 80% of MRE payable
Proposed new notification factors for Service Groups with delay multipliers 5.1 / 6.5	45% of MRE payable	65% of MRE payable	85% of MRE payable

This has a significant effect on unit Schedule 4 costs, particularly for Long Distance High Speed TOCs, for which the Notification Factor (and hence Schedule 4 cost) at maximum discount more than doubles, from 19% to 45%.

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3.4 Adjustments for recalibration of Schedule 8

Schedule 8 regimes for franchised passenger TOCs are being recalibrated as part of the Periodic Review.

A number of elements of the Schedule 8 regime affect payments under Schedule 4, namely monitoring point weights, cancellation weightings, Network Rail benchmarks (performance points) and Network Rail payment rates. All of these may, in principle, change once the regimes are recalibrated. The scope of the recalibration is yet to be decided.

In estimating Schedule 4 costs, we have taken into account what we anticipate will be the two more material changes in Schedule 8.

First, and most significantly, we have assumed that Network Rail payment rates will be increased significantly. Current payment rates were calculated on the basis of 2004/05 TOC revenue levels. They are indexed annually on RPI, but do not reflect real increases in revenue since 2004/05. We have assumed that the rates will be uplifted to reflect real increases in revenue between 2004/05 and 2007/08. Network Rail does not have access to up-to-date revenue by TOC, so we have estimated this increase at a sector level based on National Rail Trends data⁷. This gives real increases of approximately:

- 23% for Long Distance TOCs;
- 23% for London & SE TOCs; and
- 14% for Regional TOCs.

Second, we have assumed that Network Rail benchmarks are reduced to reflect the CP4 performance trajectory in the SBP. This only has a marginal effect on Schedule 4 costs, so for purposes of this calculation we have assumed a uniform reduction in benchmarks of 20% from 2006/07 to an average level over CP4.

We have adjusted the unit Schedule 4 costs for these changes.

We have assumed that, in CP4, Schedule 8 payment rates continue to be indexed only on RPI. We are aware that, as part of the recalibration of Schedule 8, ORR is considering whether rates should be indexed on growth in actual revenue, rather than just on RPI. If this proposal is implemented, the Schedule 4 costs presented in this paper will need to be increased accordingly.

Similarly, if any element of the Schedule 8 regime, other than Network Rail payment rates, is changed in such a way as to materially increase Schedule 4 payments, the costs presented in this paper will need to be increased accordingly.

⁷ The most recent edition of National Rail Trends covers the period to 2007/08 Q3. We have assumed that the percentage increase in whole-year revenue, from 2006/07 to 2007/08, is equal to the increase in year-to-date revenue between 2006/07 Q1-3 and 2007/08 Q1-3.

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Having adjusted 2006/07 Schedule 4 costs for both changes in notification factors and recalibration of Schedule 8, the estimated M&R-related Schedule 4 costs by activity are as shown in Figure 4, below.

Figure 4: Estimated Schedule 4 costs by M&R activity in 2006/07, adjusted for changes to notification factors and recalibration of Schedule 8

Activity	Adjusted Schedule 4 cost in 2006/07
Track renewals (plain line)	£61m
Track maintenance	£33m
Civils renewals	£10m
Signalling renewals	£9m
S&C renewals	£8m
Electrification renewals	£6m
Electrification maintenance	< £1m
All renewals (unspecified)	£1m
All maintenance (unspecified)	£8m
All M&R work (unspecified)	£4m

All costs in £m, 06/07 prices, excluding payments to VWC

3.5 Adjustment of unit costs when applied to WCML

As noted in section 3.2.1 above, the unit Schedule 4 costs derived from 2006/07 data are essentially average unit costs for the network *excluding* WCML.

We would expect unit Schedule 4 costs on the WCML to be significantly higher than the average for the remainder of the network, due to the high level of revenue on the route. When estimating the cost of activity on the WCML in CP4, we have therefore applied an uplift factor to unit costs,

We have estimated this uplift factor by a relatively simple analysis of relative unit Schedule 4 costs on each Strategic Route (SR). We have estimated the 2006/07 Schedule 4 costs on each SR by allocating the Schedule 4 costs of each service group between the SRs that the service group runs on, pro rata to the train mileage on each SR. We have estimated the relative volume of renewals activity, for each asset, on each SR as being pro rata to the spend on each SR as reported in the annual return.

Clearly both these assumptions are considerable simplifications. A more precise approach would involve mapping each possession in 2006/07 to the relevant SR (or SRs, in the case of possessions at some junctions); and establishing renewals volumes by SR in 2006/07. This would require considerable effort.

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The analysis does however show the general pattern that would be expected, with unit Schedule 4 costs above average on long distance, high-revenue routes; around average on other major London & SE and regional routes; and below-average on rural or more lightly-used routes. In particular, the ECML – which we believe to be the best comparator for the WCML in this context – has a unit Schedule 4 cost a little over three times the average. On this basis, we have assumed that unit Schedule 4 costs on the WCML are three times the average for the rest of the network.

When applied to CP4 activity volumes on WCML, this assumption increases the Schedule 4 cost of M&R activity on WCML from an average of approximately £60m over CP4 (using unit costs from the rest of the network) to approximately £180m over CP4 (before applying efficiency overlays), or an average of approximately £36m per year.

We have sense checked this result against a draft Schedule 4 budget for 2008/09, based on bottom-up costing of Rules of the Route possessions and compiled on the assumption that VWC are taken as being on a template Schedule 4 regime. This shows Schedule 4 payments to VWC, in respect of the revenue loss formula, of approximately £13m.

However, this is before the changes to notification factors and the recalibration of Schedule 8. The proposed changes to notification factors alone will more than double this number; and the recalibration of Schedule 8 will increase it by approximately a further 25%. The combined effect will be to increase the £13m by a factor of between 2.5 and 3, giving a total of £30m - £40m, all of which will relate to activity on the WCML. Payments to other TOCs in respect of WCML activity will increase this further, as will any possessions not included in Rules of the Route. Even allowing for differences in activity between 2008/09 and CP4 as a whole, it appears that the uplift factor of 3.0 (applied to unit costs on WCML) is not unreasonable.

Finally, it should be noted that the unit costs – and the uplift factor of 3.0 – reflect current access patterns. The revised access pattern on the WCML, following implementation of the SSSG⁸ report, is taken into account in the efficiency overlay described in section 7.2 below.

3.6 Activity volumes in CP4

Schedule 4 costs in CP4 have been calculated based on projections of activity volumes or pre-efficiency spend (as appropriate) from the ICM.

For activities where spend is used as the driver, an adjustment needs to be made because ICM projections of “pre-efficiency” costs are in fact costs at the levels of efficiency expected to be reached by the end of CP3. For example, suppose spend on an activity was £100m in 2006/07; and that spend on the same activity in CP4 is £100m per year (based on efficiency levels at the end of CP3). The

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£100m per year in CP4 represents a greater volume of activity than did the £100m in 2006/07, because of cost-efficiency achieved in the meantime.

We have therefore uplifted the Schedule 4 projections, for activities for which we are using spend as a proxy for volume, by a factor corresponding to expected efficiency improvements between 2006/07 and the end of CP3. This factor varies between activities and asset types but is typically between 1.08 and 1.12.

3.7 Results of applying unit costs to CP4 activity projections

After applying all the adjustments described in the preceding sections, applying the unit costs to projected activity volumes gives the following estimates of compensation under the revenue loss formula in CP4:

Figure 5: Estimated compensation from the revenue loss formula (M&R activity only, pre-efficiency)

	2009/10	2010/11	2011/12	2012/13	2013/14
Network total	185.5	179.6	186.1	171.1	177.0

All costs in £m, 06/07 prices

The pattern of “up and down” variation from year to year is mainly due to corresponding variations in the volume of signalling renewals planned to be commissioned in each year of CP4.

4. Negotiated compensation for revenue loss

4.1 Overview

As noted in section 2.1, there are two circumstances in which TOCs will be able to claim compensation for revenue loss over and above that provided by the revenue loss formula. These are:

- “Type 3” Restrictions of Use (ROUs of over 120 hours duration); and
- periods of Sustained Planned Disruption.

In theory, in both cases, Network Rail is similarly able to re-open compensation if it believes that the revenue loss formula has over-compensated the TOC. However, in practice Network Rail does not have access to TOC revenue data or (for this purpose) to TOC revenue models, and is therefore not in a position to identify potential over-compensation in any but the most egregious cases.

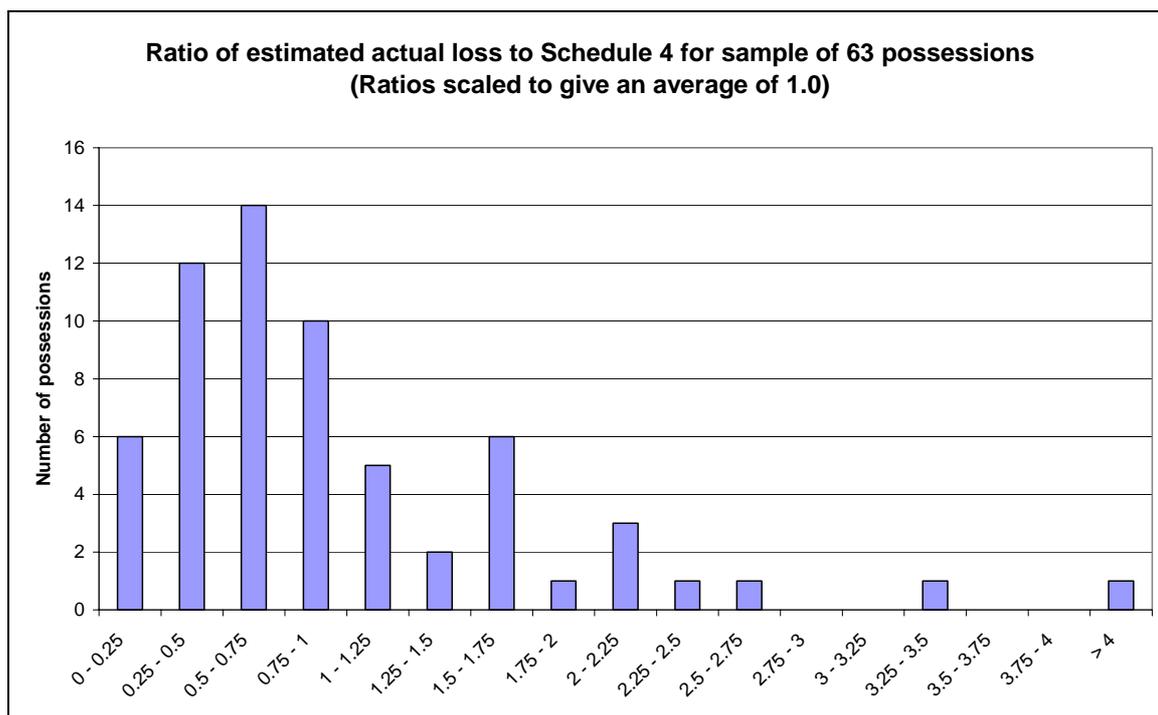
Therefore, even if the revenue loss formula gives the right level of compensation on average (which this paper takes to be the case, on the assumption that the ISG recommendations are adopted), there is likely to be a net cost to Network Rail in respect of negotiated compensation.

4.2 Type 3 possessions

We have estimated the potential cost of negotiated compensation using data generated by Steer Davies Gleave (SDG) as part of their work for ISG. For a sample of possessions, SDG estimated the actual loss (using MOIRA, adjusted for estimated passenger awareness of possessions) and compared it with Schedule 4 compensation. Dividing the former by the latter gives a ratio of actual loss to Schedule 4 compensation, for each of 63 possessions (after discarding possessions identified by SDG as outliers).

We have normalised these 63 ratios so that the average is 100% (to reflect the assumption that, after implementation of the ISG recommendations, Schedule 4 will on average give the right level of compensation). The distribution of the resulting values is shown in Figure 6 below:

Figure 6: Variability of estimated actual loss vs Schedule 4



We have assumed that, if actual loss is more than Schedule 4 compensation, a TOC will re-open compensation and claim the difference. We have also assumed that, if (and only if) actual loss is less than 25% of Schedule 4 compensation, Network Rail will identify this and re-claim the difference.

Based on these assumptions (together with the distribution shown in the graph), we estimate that negotiated compensation arrangements will, on average, add an additional 22% to the compensation generated by the revenue loss formula, for the relevant possessions.

4.3 Sustained Planned Disruption

The case of SPD is more complicated, because the SPD re-opener covers multiple possessions. To some extent, therefore, any errors in the revenue loss formula (i.e. over- or under- compensation in respect of individual possessions) might be expected to cancel itself out, if the errors are statistically independent of each other.

However, from the analysis done by Network Rail for ISG to inform their recommendations, most of the formulaic compensation in a SPD situation is likely to be caused by either a single large blockade or by a relatively small number of possessions (perhaps up to a dozen or so). Moreover, where more than one possession is involved, it is not unusual for this to be a series of similar (or even identical) possessions, for example on successive weekends. In this case, any errors in the revenue loss formula would be unlikely to be statistically independent; they may well be almost perfectly correlated with each other.

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For simplicity we have therefore assumed that, in respect of periods of SPD, the additional cost of negotiated compensation will be half of the corresponding figure for a Type 3 possession; *i.e.* that negotiated compensation will add 11% to the compensation generated by the revenue loss formula during the relevant periods. In statistical terms, this is the equivalent of assuming that compensation from the revenue loss formula during the periods concerned is generated by an average of four statistically independent possessions. Given that most of the formulaic compensation in periods of SPD is generated by either a single possession or a small series of possessions (which are probably not statistically independent), this appears to be a reasonable assumption.

4.4 Overlap between Type 3 possessions and SPD

There is likely to be overlap between Type 3 possessions and SPD, in that some Type 3 possessions will occur during periods of SPD. To avoid double-counting, the analysis described above has therefore been applied as follows.

First, based on 2006/07 data, it is estimated that approximately 4% of all compensation under the revenue loss formula is likely to occur during periods of SPD. (This excludes periods of SPD that would have been caused by WCRM and by the Portsmouth re-signalling overrun). Negotiated compensation in respect of SPD therefore adds approximately $4\% * 11\% = 0.4\%$ to the total compensation generated by the revenue loss formula.

Second, again based on 2006/07 data, it is estimated that approximately 7% of all formulaic compensation will be in respect of Type 3 possessions, *excluding* Type 3 possessions that fall in periods of SPD. (This again WCRM and the Portsmouth re-signalling overrun). Negotiated compensation in respect of these possessions therefore adds approximately $7\% * 22\% = 1.5\%$ to the total compensation generated by the revenue loss formula.

The total cost of negotiated compensation, in respect of revenue loss, is thus estimated to be $0.4\% + 1.5\% = 1.9\%$ of the total compensation generated by the revenue loss formula. An overlay of 1.9% has therefore been applied to the results of the calculations described in Section 3, above.

4.5 Results

The resulting estimates for CP4 are as follows:

Figure 7: Estimated negotiated compensation re revenue loss (M&R activity only, pre-efficiency)

	2009/10	2010/11	2011/12	2012/13	2013/14
Network total	3.5	3.4	3.5	3.3	3.4

All costs in £m, 06/07 prices

5. Cost formula

5.1 Overview

ISG has proposed the introduction of a cost formula in Schedule 4. The formula is intended to reflect the cost to TOCs of replacement buses, net of any savings in variable train running costs such as fuel and variable access charges. It is intended to apply to all Restrictions of Use.

There is no historic data on compensation under this formula. We have therefore assumed that, on average, the formula will give the correct level of compensation to TOCs (even if for a particular possession it may be an over- or under-estimate).

The total cost to Network Rail, of compensation under this formula, should therefore be equal to the total industry cost of replacement buses, net of savings in variable train running costs. We have therefore estimated this figure for 2006/07, and expressed it as a percentage of compensation payable under the revenue loss formula (after the adjustments to notification factors and recalibration of Schedule 8). We have then applied this percentage to estimated payments under the revenue loss formula in CP4.

5.2 Methodology

As part of the work to support ISG's recommendations, Faber Maunsell were commissioned to examine TOCs' costs. ATOC provided data on possessions-related costs in 2006/07 for 11 of the TOCs, showing bus-related and other costs, split between Part G, SROU and other possessions. This was extrapolated to give network-wide totals⁹.

On the basis of this data we estimate total industry bus costs in 2006/07 to have been approximately £21.7m in respect of SROUs and "ordinary" ROUs, with a further £5.1m in respect of Part G possessions. As with the other elements of Schedule 4, we would ideally exclude WCRM-related costs and the costs of the Portsmouth re-signalling overrun, but include costs relating to other Part G projects. However, we do not have this level of detail. We have therefore deducted 50% from the Part G costs, based on inspection of the costs for the sample of TOCs in the ATOC data. This gives a total of £24.2m of bus costs.

The Faber Maunsell report¹⁰ suggests, on the basis of six sample TOCs, that approximately 13% of bus costs are offset by savings from reductions in train mileage. We have therefore reduced the £24.2m by 13% to give an estimated total of £21.0m that would have been payable in 2006/07, had the cost formula

⁹ See the Faber Maunsell report for Network Rail, ORR and ATOC, "Review of Possessions Cost Compensation", 17 September 2007, Tables 1.2 and 2.2.

¹⁰ See Table 4.1 of the Faber Maunsell report

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been in place. This is 14.7% of what total payments would have been under the (adjusted) revenue loss formula (£143m).

On this basis, we have estimated payments under the cost formula in CP4 as 14.7% of the payments under the revenue loss formula.

5.3 Results

The estimated costs in CP4 are shown in Figure 5, below.

Figure 8: Estimated compensation from the cost formula (M&R activity only, pre-efficiency)

	2009/10	2010/11	2011/12	2012/13	2013/14
Network total	27.2	26.4	27.3	25.1	26.0

All costs in £m, 06/07 prices

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6. Negotiated compensation for costs

6.1 Methodology

Under the ISG recommendations, TOCs will be able to claim for costs over and above the cost formula in respect of Type 2 and Type 3 possessions, and in respect of periods of Sustained Planned Disruption.

Type 2 and Type 3 possessions together cover the same possessions as the current SROU definition (in the sense of 60+ hour possessions). Similarly, it is intended that possessions covered by Sustained Planned Disruption are intended to be broadly similar in scale to those currently covered by Major Project Notices (which are SROUs by definition) and by large Network Changes.

In summary, therefore, the circumstances in which TOCs will be able to negotiate additional cost compensation broadly correspond to possessions which currently qualify as SROUs or Part G. We have therefore estimated the cost of what negotiated compensation would have been in 2006/07, based on the level of non-bus costs in the ATOC data provided to Faber Maunsell¹¹.

We have included all non-bus costs relating to SROUs, and (as with the cost formula, above) 50% of non-bus costs relating to Part G possessions, to give an estimated total of £2m for 2006/07, or 1.6% of the £143m compensation under the revenue loss formula¹².

We have therefore estimated negotiated cost compensation in CP4 as being 1.6% of payments under the revenue loss formula, giving expected payments as follows:

Figure 9: Estimated negotiated compensation re costs (M&R activity only, pre-efficiency)

	2009/10	2010/11	2011/12	2012/13	2013/14
Network total	2.9	2.8	2.9	2.7	2.8

All costs in £m, 06/07 prices

¹¹ We have assumed that bus costs are covered by the costs formula, with over- and under-compensation in respect of individual possessions balancing out in the long run.

¹² Erratum note: as a result of a spreadsheet error, discovered just before submitting the SBP update, the methodology described above was inadvertently applied to the costs in respect of the 11 TOCs in the ATOC sample, rather than to all TOCs. Total costs for 2006/07 were therefore estimated at £2m (as stated above) rather than £4m (which would have been the correct figure). This resulted in Schedule 4 costs in CP4 being under-stated by approximately £3m per year. This has not been corrected in the plan or in the models.

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6.2 Overlap between negotiated cost and revenue compensation

The methodology described above has treated cost and revenue compensation separately. However, for Type 3 possessions, and in respect of SPD situations, negotiated compensation is intended to take account both costs and revenue together (similar to current compensation arrangements under Part G).

In principle this will reduce the compensation payable, compared to what would be the case if cost and revenue compensation were to be negotiated separately. This is because over-payments in respect of costs (i.e. where the costs formula exceeds the total of bus and non-bus costs) could be netted off against under-payments in respect of revenue (i.e. where actual losses exceed the revenue loss formula); and *vice versa*.

There is no historical data available from which to estimate the extent of this reduction. In practice, it has been very rare, in Part G claims, for under- and over- payments to be netted off in this way, in part because of Network Rail's lack of access to TOC revenue data and models. We have therefore not taken this into account in our estimates.

7. Efficiency (including 7 day railway)

7.1 Notification Efficiency

There are three levels of discount in Schedule 4, depending on when Network Rail notifies possessions to TOCs. In 2006/07 the proportion of possessions notified at maximum discount – expressed as a percentage of the total *undiscounted* Schedule 4 cost – was as follows:

- 84% at maximum discount (notified in time for inclusion in the First Working Timetable (FWT));
- 9% at medium discount (notified after FWT timescales but in time for inclusion in the T-12 timetable upload); and
- 7% at minimum discount (notified after the T-12 upload)

These figures exclude emergency timetables for events such as storms or flooding, which by their nature are paid at minimum discount. They also exclude WCRM possessions and the Portsmouth re-signalling overrun.

Network Rail believes that a realistic aim is to improve this profile to 85% / 10% / 5% by 2013/14. This equates to a 0.13% per year reduction in each year between 2006/07 and 2007/08, which has been factored into the cost estimates for CP4.

7.2 Access Efficiency

“Access efficiency” is delivering a given amount of work in less access time (or to be more precise, in ways that are less disruptive to train services).

The base plan contains initiatives designed to improve access efficiency, such as the modular renewal of S&C. On the WCML a new access pattern, developed following the SSSG report, will be implemented.

Under the 7 day railway proposal, further improvements in access efficiency would be made on selected routes over CP4.

The work to establish projections of the Network Availability Measure has quantified the improvements that will be made over CP4, under both the base plan and the 7 day railway, based on bottom-up forecasts of possessions requirements. In particular, projections have been made of improvements in the passenger Network Availability Measure, which is based on the Schedule 4 revenue loss algorithm.

These improvements have been applied as overlays to all elements of Schedule 4 costs relating to M&R activity. We have also assumed a reduction of 3% per year in disruption (for a given volume of activity) between our base year of 2006/07 and the start of CP4.

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The overall effect is that:

- in the base plan, Schedule 4 costs in 2013/14 are 23% lower than would have been the case at 2006/07 levels of access efficiency
- under the 7 day railway proposal, Schedule 4 costs in 2013/14 (across the network as a whole) are 30% lower than would have been the case at 2006/07 levels of access efficiency.

To the extent that projections of the Network Availability Measure are refined over the remainder of the Periodic Review, we would expect this to be reflected in the efficiency overlays for expected Schedule 4 costs.

8. Emergency timetables

8.1 Overview

Under Schedule 4, Network Rail compensates TOCs for emergency timetables imposed for any reason (other than for causes under the TOC's own control). Emergency timetables are generally imposed due to events external to the railway, such as severe storms, flooding and fires near the railway that affect operations. They may also be imposed as a result of railway-related events such as fires caused by vandalism, or derailments.

These events are infrequent, but it is reasonable to expect them to occur from time to time. Clearly Network Rail does not seek funding for compensation as a result of incidents for which it is itself responsible. However, it is reasonable for Network Rail to be funded for a reasonable estimate of compensation in respect of external events, or incidents caused by other parties.

In relation to the revenue loss formula, the expected cost of such compensation has been taken as the average of over the years 2005/06 to 2007/08 inclusive (this being the period for which data was readily available), adjusted for the proposed changes to notification factors and for recalibration of Schedule 8.

Although we might expect to be able to make some improvements, over time, in our ability to mitigate events such as storms and flooding, in many cases the events are so overwhelming that it is hard to envisage significantly improved mitigation at reasonable cost. Also, it is arguable that the frequency of these events might be expected to increase in future, as a consequence of climate change. Given the difficulty of quantifying these issues, and the relatively modest sums involved, we believe that the most reasonable approach is to leave this cost unchanged over CP4.

8.2 Results

The relevant payments in each year were as follows (after these adjustments, and expressed in 2006/07 prices):

- 2005/06: £1.2m (of which c. £850k was due to the freight train derailment at Cheltenham in October 2005).
- 2006/07: £3.0m (of which c. £2.4m was due to the fire near Kings Cross, which required an emergency timetable to be put in place on 27 June 2006)
- 2007/08: £21.3m (mostly due to flooding and related incidents such as landslides. Schedule 4 costs of the freight train derailment at Soham in June

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amounted to approximately £3.2m; we have included 50% of this figure, as responsibility for the incident is not yet clear.)¹³.

This gives average payments of £8.5m per year in respect of the revenue loss formula. Compensation under the cost formula, and negotiated compensation in respect of both revenue and costs, have then been estimated as a percentage of compensation under the revenue loss formula, using the same percentages as were applied in respect of M&R activity.

This gives a total estimated cost of £10.1m per year in CP4.

¹³ Erratum note: as a result of a spreadsheet error (essentially, un-discounting historic payments twice before applying the new notification factors), discovered just before submitting the SBP update, the costs of Emergency Timetables in 2005/06 were overstated: they should have been approximately £0.9m rather than £1.2m. Similarly, the costs in 2007/08 should have been approximately £17.7m rather than £21.3m. Costs in 2006/07 were unaffected. This resulted in Schedule 4 costs in CP4 being over-stated by approximately £1.5m per year. This has not been corrected in the plan or in the models. (Note that this is less than the under-statement introduced as a result of the error described in section 6.15.2)

9. Access Charge Supplements

9.1 Methodology

In principle, the most accurate way to disaggregate Schedule 4 costs between TOCs would be to estimate Schedule 4 costs relating to activity on each Strategic Route; and then divide these between the TOCs on the route in a way that reflects the relative Schedule 4 cost of each TOC. This would ensure that the ACS reflected both the expected volume of activity on each route, and the relative Schedule 4 costs of different TOCs.

However, this would require unit Schedule 4 costs specific to each Strategic Route, which (as noted in section 3.5 above) would require considerable effort to establish. Instead, we currently have a single, network-wide unit Schedule 4 cost for each activity.

We therefore have a choice between two approaches:

- (i) Estimate future Schedule 4 costs by Strategic Route, based on activity volumes on each route applied to a single, national unit Schedule 4 cost; and then disaggregate between TOCs on the route. This would result in ACSs that reflect variations in activity volumes between routes, but would not reflect the variation in unit Schedule 4 costs between routes
- (ii) Estimate Schedule 4 costs nationally, and disaggregate between TOCs based on relative levels of historic Schedule 4 payments. This would result in ACSs that do not reflect variations in activity volumes between routes (or rather reflect historic activity volumes not future volumes); but which do reflect the variation in unit Schedule 4 costs between routes.

Given these two options, we have chosen option (ii). This is because we believe the error introduced by (in effect) using past rather than future patterns of activity volumes, is less than the error introduced by ignoring variations in unit Schedule 4 costs.

Projected Schedule 4 costs have therefore been disaggregated into Access Charge Supplements (ACSs) as follows:

- For Virgin West Coast, the ACS has been calculated as 75% of the estimated Schedule 4 costs relating to activity on the WCML (there being no historic template Schedule 4 data for VWC).
- For all other TOCs, the remaining Schedule 4 costs have been divided pro rata to Schedule 4 payments in 2006/07 (adjusted for changes to notification factors and recalibration of Schedule 8).

We have applied this methodology to Schedule 4 costs in both the base plan and the 7 day railway scenario.

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We believe that this methodology gives a reasonable indication of a suitable ACS for each TOC. It would be possible to improve the accuracy of the ACSs, but this would be likely to require substantial additional effort. Some improvement could be gained by using more than one year of historic data, or (in the case of the 7 day railway) relating reductions in the ACS to the routes concerned; but fundamental improvements would be likely to require extensive mapping of historic data to Strategic Routes. We would therefore like to discuss with ORR the extent to which such effort is justified, given that changes to ACSs in franchised TOCs' track access agreements are (we understand) passed through to funders under Clause 18.1 / Schedule 9 of the relevant franchise agreement.

9.2 Results

Under the base case, Access Charge Supplements for each franchised passenger TOC (and also Heathrow Connect, which is currently on a template Schedule 4 regime) are as follows:

Figure 10: Access Charge Supplements (base plan)

	2009/10	2010/11	2011/12	2012/13	2013/14
Arriva Trains Wales	£1.4m	£1.3m	£1.3m	£1.1m	£1.1m
Arriva Cross Country	£14.1m	£13.0m	£12.9m	£11.0m	£11.3m
c2c	£2.4m	£2.3m	£2.2m	£1.9m	£2.0m
Chiltern	£2.8m	£2.5m	£2.5m	£2.2m	£2.2m
East Midlands	£7.6m	£7.0m	£7.0m	£6.0m	£6.1m
FCC	£7.7m	£7.1m	£7.0m	£6.0m	£6.2m
FGW	£40.0m	£36.9m	£36.6m	£31.2m	£32.2m
Gatwick Express	£3.1m	£2.9m	£2.9m	£2.5m	£2.5m
Heathrow Connect	£0.1m	£0.1m	£0.1m	£0.1m	£0.1m
London Midland	£2.3m	£2.1m	£2.1m	£1.8m	£1.9m
LORL	£0.5m	£0.5m	£0.5m	£0.4m	£0.4m
Southeastern	£3.8m	£3.5m	£3.5m	£3.0m	£3.1m
Merseyrail	£2.8m	£2.5m	£2.5m	£2.2m	£2.2m
Northern	£2.5m	£2.3m	£2.3m	£1.9m	£2.0m
NXEC	£37.8m	£34.9m	£34.7m	£29.6m	£30.5m
One	£8.7m	£8.0m	£8.0m	£6.8m	£7.0m
ScotRail	£6.4m	£5.9m	£5.8m	£5.0m	£5.1m
Southern	£8.3m	£7.7m	£7.6m	£6.5m	£6.7m
SWT	£18.3m	£16.9m	£16.8m	£14.3m	£14.8m
TPE	£2.2m	£2.0m	£2.0m	£1.7m	£1.8m
Virgin West Coast	£36.4m	£33.6m	£33.3m	£28.4m	£29.3m
Total:	£209.3m	£193.1m	£191.7m	£163.5m	£168.6m

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Under the 7 day railway scenario, we have estimated ACSs as follows:

Figure 11: Access Charge Supplements (7 day railway)

	2009/10	2010/11	2011/12	2012/13	2013/14
Arriva Trains Wales	£1.4m	£1.3m	£1.3m	£1.1m	£1.1m
Arriva Cross Country	£14.1m	£13.0m	£12.7m	£10.8m	£10.5m
c2c	£2.4m	£2.3m	£2.2m	£1.9m	£1.8m
Chiltern	£2.8m	£2.5m	£2.5m	£2.1m	£2.1m
East Midlands	£7.6m	£7.0m	£6.9m	£5.9m	£5.7m
FCC	£7.7m	£7.1m	£7.0m	£5.9m	£5.7m
FGW	£40.0m	£36.8m	£36.1m	£30.7m	£29.8m
Gatwick Express	£3.1m	£2.9m	£2.8m	£2.4m	£2.3m
Heathrow Connect	£0.1m	£0.1m	£0.1m	£0.1m	£0.1m
London Midland	£2.3m	£2.1m	£2.1m	£1.8m	£1.7m
LORL	£0.5m	£0.5m	£0.5m	£0.4m	£0.4m
Southeastern	£3.8m	£3.5m	£3.5m	£3.0m	£2.9m
Merseyrail	£2.8m	£2.5m	£2.5m	£2.1m	£2.1m
Northern	£2.5m	£2.3m	£2.2m	£1.9m	£1.8m
NXEC	£37.8m	£34.9m	£34.2m	£29.1m	£28.2m
One	£8.7m	£8.0m	£7.9m	£6.7m	£6.5m
ScotRail	£6.4m	£5.9m	£5.7m	£4.9m	£4.7m
Southern	£8.3m	£7.7m	£7.5m	£6.4m	£6.2m
SWT	£18.3m	£16.9m	£16.6m	£14.1m	£13.7m
TPE	£2.2m	£2.0m	£2.0m	£1.7m	£1.6m
Virgin West Coast	£36.4m	£33.5m	£32.9m	£28.0m	£27.1m
Check total:	£209.3m	£192.8m	£189.2m	£160.9m	£156.0m

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Appendix A: models used in calculations

The following models were used in the calculations described in this document, and have been supplied to ORR electronically. Some of the models are “linked” electronically to each other.

Filename	Function
PPS0607 p1-13 pre-processing.mdb	Matches S4CS possessions to possession records in PPS, and matches PPS work types to activities used in the calculation of unit costs. Outputs a % split between activities, for each possession in the S4CS data
S4CS data processing v3.xls	<p>Processing of S4CS data for 2006/07. Adjusts historic Schedule 4 costs for changes to notification factors and for recalibration of Schedule 8, and strips out possessions relating to WCRM and the Portsmouth re-signalling overrun.</p> <p>Calculates total historic Schedule 4 cost for each activity, as an input to unit cost calculation.</p> <p>Also performs all other calculations requiring detailed analysis of 2006/07 Schedule 4 costs:</p> <ul style="list-style-type: none">• Estimates the amount of historic Schedule 4 cost that would have fallen under Sustained Planned Disruption provisions and/or related to Type 3 possessions, as an input into the estimation of negotiated revenue loss compensation• Calculates the current “discount mix” and the effect on Schedule 4 costs of moving to the 85/10/5 target by 2013/14• Calculates Schedule 4 cost by service group and activity, as an input into the analysis of the variation in unit Schedule 4 costs between routes• Calculates historic Schedule 4 payments mapped to current TOCs, as an input into the calculation of Access Charge Supplements• Calculates the Schedule 4 costs relating to emergency timetables in 2006/07
ETT analysis 2005-06.xls	Calculates Schedule 4 payments in 2005/06 in respect of emergency timetables, adjusted for changes to notification factors and for recalibration of Schedule 8.

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Filename	Function
ETT analysis 2007-08.xls	Calculates Schedule 4 payments in 2007/08 in respect of emergency timetables, adjusted for changes to notification factors and for recalibration of Schedule 8. Note that S4CS data (Part 3 reports) for periods 12 and 13 were not available, so figures (in some cases estimates) from Compensation Managers were added in directly.
Variability of unit Sch4 costs by SR.xls	Performs the rough analysis of Schedule 4 costs by Strategic Route, described in section 3.5, from which the "unit cost multiplier" of 3.0 for WCML was estimated
S4 revenue loss top-up v1.xls	Performs the analysis of variability between actual revenue loss (as estimated by MOIRA) and Schedule 4 payments, described in section 4. Concludes that negotiated revenue compensation is likely to represent 1.9% of payments under the revenue loss formula
CP4 Sch4 costs main model v3.xls	Brings together the results of all the models above, and calculates the expected Schedule costs over CP4. Includes: <ul style="list-style-type: none">• calculation of unit costs and their application to CP4 activity volumes / spend;• calculations re cost compensation based on ATOC / Faber Maunsell data;• derivation of efficiency overlays;• disaggregation into ACS for each TOC.