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OFFICE OF RAIL REGULATION

4 July 2008

Dear colleague

PR08: Consultation on network availability and the seven day railway

1. As part of the current periodic review of Network Rail's outputs and access charges, we intend to require Network Rail to reduce disruption from possessions. We are seeking your views on our proposals.

2. In our draft determinations, published on 5 June 2008, we set out the level of outputs Network Rail is required to deliver in areas such as delay minutes caused, but in the area of 'network availability and the seven day railway' we said we would consult separately. The attached paper is our consultation on that output area.

3. The consultation paper:

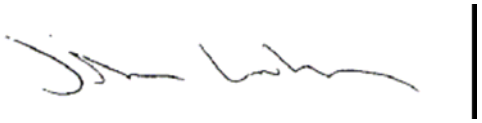
    - provides background information;
    - explains the changes Network Rail intends to make to the way it undertakes engineering work and the potential impact on passengers and freight;
    - describes the new Possession Disruption Indices (PDIs) for passengers and freight that we intend to establish;
    - sets the proposed trajectories for the PDIs for CP4. Network Rail will be required to deliver or improve on these trajectories; and
    - explains how we intend to monitor the PDIs.

4. We would appreciate your comments by 4 September 2008.

5. We will take your responses into account for our final determinations, which we will publish on 30 October 2008.

6. Thank you in advance for your input.

Yours sincerely



John Larkinson

PR08: Network availability and the seven day railway

1. Introduction

Current position

1.1 We published our draft determinations on 5 June. Once finalised these will establish Network Rail's outputs and access charges for the next control period (CP4), which runs from 1 April 2009 to 31 March 2014.

1.2 We set out the level of outputs Network Rail will be required to deliver in areas such as delay minutes caused, but in the area of 'network availability and the seven-day railway' we said we would consult separately. This document is our consultation on that output area.

1.3 Network availability relates to the impact of disruptive engineering possessions. A possession refers to a section of the network that is temporarily taken out of service for maintenance, renewal or enhancement work to take place. Many possessions are taken when no train services are planned to be run but some are disruptive and require trains to be diverted, cancelled or replaced with buses. The latter affect the level and quality of services for users.

1.4 It is widely recognised that too much of the railway is unavailable for traffic for too long as a result of engineering work. In recent years there has been a trend for the length of individual possessions to increase. Network Rail's data shows a reliance on long possessions, with some possessions currently extending up to 54 hours in length (typically from Friday night to Monday morning). Network Rail believes - and we and the industry agree - that its current strategy of relying to a large extent on long possessions will hinder the future growth of the industry. Passengers need a railway that better meets customer requirements for travelling at weekends or late in the evening and where scheduled services are not routinely disrupted. In turn this will generate more revenue for the railway.

Proposed changes

1.5 Network Rail and the industry have been working together, with our support, on new approaches to engineering work that will change the number and duration of possessions. Network Rail intends to move towards more, shorter, possessions often at night during the week. It does not intend to remove long possessions everywhere, as they may still be beneficial, for example, on less used parts of the network.

1.6 In general, freight traffic has been less affected by long weekend possessions because many more freight trains run on a weekday night

than on a weekend night. Hence, there is a risk that in making changes for the benefit of passengers, there may be an adverse impact on freight. Network Rail needs to manage the change to ensure the needs of the freight industry are met.

1.7 The changes in Network Rail's possession strategy are often referred to as the 'seven-day railway' concept. This term is used as shorthand for a range of changes. In this document, for simplicity, we have distinguished two stages in Network Rail's planned changes. Stage 1 refers to a general move towards carrying out more productive work within a given length of possession and to use shorter possessions for some of the renewals work that Network Rail carries out. Stage 2 will involve, for designated routes, mainly eight hour possessions, often on a single track or two tracks on multiple track routes, with adjacent lines routinely open for traffic. Stage 2 will require specific investment, for instance in improved signalling or crossover facilities.

1.8 These changes involve different working methods that have the potential to increase risks. Network Rail will need to manage the changes carefully so as to not compromise health and safety or create risks that are not capable of being managed. Part of the extra funding we are making available is for safety related expenditure such as improved lighting and staff access.

1.9 Passenger train operators are compensated for the effect of engineering possessions on their income and costs. Schedule 4 of the track access agreements between Network Rail and train operating companies sets out the compensation arrangements for planned possessions on the network. There is also a compensation regime for freight.

1.10 The system of compensation will continue (although subject to some changes under other aspects of the periodic review, see Chapter 26 of our draft determinations), but we also see benefits from setting Network Rail a clear output target to deliver less disruption to users of the rail network and then monitoring the company's progress.

1.11 We therefore intend to set Network Rail a regulated output to reduce passenger disruption from possessions for CP4 for the whole network (including Scotland). This will be measured using a new possession disruption index for passengers (PDI-P).

1.12 We also intend to recognise the different potential impacts on freight by requiring Network Rail to manage the implementation of the changes such that a new freight disruption index (PDI-F) is held constant and to publish information on the freight impact from the stage 2 investment. In operational terms we expect disruption to freight to reduce because

possessions will be taken on a more predictable basis, but this effect cannot be captured in the index.

2. Network Rail's proposed changes

2.1 Network Rail takes possessions for a wide range of maintenance, renewals and enhancement work. The length of a possession typically varies according to the type of work being undertaken. For example, relatively complex renewals, such as replacing a switch and crossing unit, can currently take up to 54 hours.

2.2 Delivering shorter possessions will involve significant changes in Network Rail's working methods. For stage 1 this will include:

- introducing new processes for timetable and engineering works planning;
- introducing modular installation methods by making more use of off-site and prefabrication work on modular assemblies;
- introducing a new method of protecting staff called Track Occupancy Permit (TOP) (which uses enhanced communication over the new GSM-R network to set up safe systems of work) which will contribute towards maximising the productive time available within a possession by minimising the time taken to take and give up a possession. Also new processes will be developed that will reduce the time to take and give up an electrical isolation (i.e. when electrical current is switched off so that work can be carried out safely); and
- reducing the time taken in testing and commissioning signalling renewals during the possession by making more use of off-site testing.

2.3 Stage 1 will also involve piloting and bedding in processes which are essential for full implementation of stage 2 – for example:

- introducing more 'high output' track renewals equipment to enable larger volumes of work to be completed in eight-hour possessions and allow operations with the adjacent line open;
- introducing improved processes for conventional track renewals which should reduce the time for most conventional track renewals activities to 16 hours;
- enabling much more planned maintenance and renewal work to be undertaken under single line working conditions, leaving an adjacent line available for the operation of train services;

2.4 Most of the stage 2 planning activities will be carried out in parallel with stage 1 works, but Network Rail believes that the extra benefits associated with the reduction in the length of possessions are only realised in the last two years of the control period. We have accepted that delivering stage 2 will take time, but we believe that this assumption provides a significant level of contingency to Network Rail, and hence provides considerable protection against risk.

2.5 Implementing stage 2 will mean that, on designated routes, engineering work will be undertaken mainly in eight-hour possessions with adjacent lines routinely open to traffic, thereby allowing a half-capacity railway to remain open, i.e. four tracks to two tracks, two tracks to a single line worked track. The half-capacity railway could be a significant improvement on current practices which often involve bus substitution for passenger services and long diversionary routes which are difficult for train operators to plan for (as drivers need to be familiar with a new route before driving on it).

2.6 To illustrate the changes for renewals, table 1 shows the number of possessions by length of possession for stage 1 and table 2 shows how these are predicted to change in each year of CP4 with stage 1 and stage 2 levels of investment. These forecasts have been provided by Network Rail. Although renewals account for a much smaller part of overall possessions than maintenance, renewals possessions tend to be longer in duration.

2.7 In stage 1, the number of possessions increases year-on-year until 2011-12 and then reduces to around the same level as 2008-09. The total number of possession hours is expected to reduce year-on-year due to the efficiencies in working practices identified in paras 2.2 and 2.3. The phasing of work over the entire control period (in terms of the size and complexity of projects) has a significant impact on the length of possession hours and the average length of possessions.

2.8 As can be seen from tables 1 and 2, neither stage 1 nor stage 2 will entirely remove the requirement for some 54 hour possessions, although Network Rail predict that their number should reduce by a quarter by the end of CP4 with stage 2 levels of investment. There will also be a more general shift towards shorter possessions and stage 2 should see the number of 16 hour possessions falling by nearly 90%. In stage 2, the number of possessions increases significantly but this is accompanied by a material fall in the average length of possessions for most work categories.

Table 1: Network Rail forecast of number of possessions for renewals by length of possessions in stage 1

	Stage 1					
Type of possession	2008-09	2009-10	2010-2011	2011-2012	2012-2013	2013-2014
54 hour	320	320	310	270	250	270
36 hour	340	340	100	90	120	70
27 hour	740	740	700	680	340	400
16 hour	1,020	1,020	960	960	1,230	1,220
8 hours weekend nights	2,750	2,750	2,710	2,760	2,720	2,730
8 hours weekday nights	580	580	1,500	1,720	1,500	1,070
Total[1]	**5,750**	**5,750**	**6,290**	**6,470**	**6,160**	**5,760**
Total number of possession hours	**92,000**	**92,000**	**88,000**	**87,000**	**80,000**	**78,000**
Average length of possessions (hours)	**16.1**	**16.1**	**14.0**	**13.5**	**13.0**	**13.5**

Table 2: Network Rail forecast of number of possessions for renewals by length of possessions in stage 2

	Stage 2					
Type of possession	2008-09	2009-10	2010-2011	2011-2012	2012-2013	2013-2014
54 hour	320	320	300	260	240	240
36 hour	340	340	110	90	90	60
27 hour	740	740	700	630	230	230
16 hour	1,020	1,020	1,000	1,100	1,220	120
8 hours weekend nights	2,750	2,750	2,710	2,760	3,710	5,610
8 hours weekday nights	580	580	1,500	1,720	1,500	2,070
Total[1]	**5,750**	**5,750**	**6,290**	**6,550**	**6,980**	**8,330**
Total number of possession hours	**92,000**	**92,000**	**88,000**	**88,000**	**83,000**	**84,000**
Average length of possessions (hours)	**16.1**	**16.1**	**14.0**	**13.4**	**11.9**	**10.1**

2.9 The principle of making more efficient use of the time within a possession of any given length is continued with stage 2, but there will also be infrastructure investment to cover:

- new machinery and capital plant, e.g. new cabling train;
- installing additional crossovers fully integrated with the signalling system to increase flexibility so that trains can bypass engineering on an adjacent line;

[1] Totals may not add up due to rounding

- providing bi-directional signalling to provide more network availability through single line working;
- improving physical access to the infrastructure, providing fixed lighting at key junctions and major access points to maintain safe working; and
- improvements in the maintainability of the railway e.g. by investment in more asset condition monitoring equipment so that faults can be fixed in a planned manner before they lead to a failure.

2.10 Higher recurring costs are also forecast, reflecting increased mobilisation and demobilisation to and from sites due to the more frequent and shorter possessions required, and increased staff costs.

2.11 All these changes will impact on the users of the railway. While the exact impact will vary, table 3 provides a broad summary of how the planned changes will affect passengers and freight.

Table 3: Impact of Network Rail's planned changes to engineering possessions

	Approach	**Passenger and Freight Impact**
Current approach	Possessions involving whole route blockages.[2] Reliance on longer possessions impacting on normal operating hours. Irregular timetabling of maintenance and renewals work.	Affected passenger services either cancelled, re-routed (with increased journey time) or involve bus substitution. Lack of consumer confidence in booking rail journeys in the future. More freight train and passenger train drivers need to learn diversionary routes in order to keep up with irregular changes to timetable.
Stage 1	Much less reliance on longer possessions and more, shorter, possessions. Where possible, midweek eight-hour possessions during the night will be used. More regular timetabling of work.	Reduce the need for regular disruption to passengers on Saturdays and allow for operation of full services from Sunday afternoons onwards. Potential negative impact on freight mitigated by increased use of regular plans.
Stage 2 (after additional investment on designated routes)	Installation of more crossovers and bi-directional signalling (to allow for single line working). Engineering work to be undertaken mainly within eight-hour possessions, with adjacent lines routinely open to traffic, thereby allowing a half-capacity railway to remain open.	Provision of at least some passenger services on designated routes throughout Sundays – reduced or no bus substitution. Provide additional train paths and increased flexibility in response to possessions. Fewer or no cancellations for passengers. Timetable that offers consistent services on each of the seven days in the week. Allow operation of freight services at commercially desirable times by close working between Network Rail and the freight operators to facilitate long term planning.

[2] 'Whole route blockage' is when a possession closes an entire section of line and often involves rail replacement bus services

3. Possession disruption indices

3.1 Network Rail and ORR jointly commissioned consultants Steer Davies Gleave (SDG) to define measures, based on currently available data, which would reflect how the level of disruption to users of the railway should change as a result of Network Rail's proposed changes in working methods. An industry group was closely involved in the work.

3.2 For passengers, it was decided that the disruption caused by planned possessions should be measured in terms of the economic value of excess journey times, which could draw on existing data that is used to calculate compensation to operators under the Schedule 4 regime. For freight the concept is of network 'unavailability' weighted by the amount of freight traffic affected because it was difficult to establish a "value" of the disruption to freight given the frequently changing customer base (and associated value of the freight being carried by each freight operator). Separate indices were therefore generated for passengers and freight. These indices are:

- **Passenger index (PDI-P)** - measures the impact of engineering possessions in terms of the economic value of the excess journey time passengers experience, normalised by total train-km; and
- **Freight index (PDI-F)** - measures the 'unavailability' of track for freight use, weighted by the level of freight traffic operated over each section of track.

3.3 The main purpose of the indices is to provide a measure of overall disruption and establish appropriate incentives, while not encouraging perverse behaviour. The indices are not intended to measure local disruption.

3.4 The two indices have been the subject of previous industry consultations, the results of which are summarised in the Appendix. SDG's November 2007 report [3] provides an explanation of the initial work carried out in developing the model used to establish the indices.

3.5 Establishing targets for the possession disruption indices (PDIs) involved two steps:

- step 1 - understand the historic patterns of the indices to ensure they represented actual experience to date in a reasonable way, and establish a base year; and
- step 2 - forecast the indices. We did this for three 'scenarios':

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[3] *"Network Availability Reporting Suite (NARS) - Outline Technical Specification"* http://www.rail-reg.gov.uk/upload/pdf/cnslt-netwrk_avail-specrep_SDG.pdf

- o business as usual – assuming Network Rail's current possession strategy, methods and efficiency levels;
- o stage 1 – this takes account of the changes in methods for stage 1 which means that the same volume of work is done in more, but in shorter possessions; and
- o stage 2 – assumes stage 2 investment on eight priority routes which will increase the number of shorter possessions compared to stage 1.

Step 1: historic indices

3.6 The first step involved calculating the PDIs for recent years based on actual experience of the disruption caused by planned possessions.

3.7 The index has been calculated for the period April 2006 to March 2008 using possession data from Network Rail's Possessions Planning System (PPS). For the passenger index, Network Rail's Schedule 4 Compensation System[4] (S4CS) provided information on how many minutes extended journey time were caused to each 'service group' (each type of service) as a result of each planned possession. These extended journey time minutes were then weighted to reflect the average number of passengers travelling at that time and the average value of time for those passengers. These weights provide the basis for measuring disruption by capturing the timing of the possession and the value of time of those affected. The weighted disruption was then normalised using the number of scheduled train-km for that service group (as given by S4CS).

3.8 There is no equivalent of S4CS for freight operators and so information on disruption to operators is not readily available. Therefore the approach taken was to measure the proportion of the network 'unavailable' due to possessions, where each section of the network was weighted to reflect the amount of freight traffic passing over it (as obtained from ACTRAFF, a Network Rail database of train movements).

3.9 The historic indices were generated separately for possessions by work category (maintenance, renewals and enhancements) based on the split between actual expenditure and possessions. This was important because we also wanted to be able to forecast the indices separately for these three categories and to check the reasonableness of those forecasts based on the input data.

3.10 The historic indices show a sensible profile. For example, periods of

[4] The changes to Schedule 4 as outlined in Chapter 26 of our draft determinations will not affect the data used to calculate the PDI-P.

extensive disruption due to engineering works caused the historic indices to rise sharply. This provides reassurance that they provide a realistic representation of disruption.

3.11 We decided that 2007-08 should be the base year for the indices, as this is the last full year for which we have historic data.

Step 2: forecasts for CP4

3.12 The second step was to forecast the disruption expected from planned possessions. Forecasts were generated for the three scenarios: business as usual, stage 1 and stage 2.

3.13 The main input to the calculations is Network Rail's possession plans where Network Rail has forecast the number of possessions by:

- work type (maintenance or renewals, and by type of renewals);
- possession duration time band (ranging from less than 6 hours to more than 60 hours);
- 19 main routes (including the eight routes where stage 2 investment is proposed); and
- year (2009-10 to 2013-14).

3.14 Weights were then applied to each possession duration time band to reflect the relative level of disruption based on freight and passenger travel patterns, as represented in ACTRAFF for freight and the passenger demand database, MOIRA, for passengers.

3.15 For enhancements, possession hours forecasts were not available and so the enhancement component has been forecast on the basis of the ratio of enhancement expenditure to renewals expenditure. We adjusted the disruption attributed to enhancements by scaling it in proportion to the reduction in disruption for renewals (as compared with the business as usual scenario) to reflect the move towards more, shorter, possessions given by stage 1 and stage 2 investment.

3.16 Not all enhancement possessions are disruptive, for example, planned work on station platforms need not interfere with the operation of non-stopping train services. Network Rail provided weightings to reflect the relative level of disruption of enhancement expenditure compared to typical equivalent expenditure on renewals for passenger and freight. While we have accepted Network Rail's passenger impact weights, we have revised the freight weights to better reflect the availability of single line or adjacent line working and created a new enhancement-to-renewal ratio for freight for the forecast of disruptive hours.

Assumptions and limitations of the approach

3.17 The CP4 forecasts are based on the following assumptions:

- Network Rail's possessions forecasts are reasonable given the available information and their proposed changes to methods of working;
- When forecasting the historic metric for 2008-09 and forecasting the volume of work undertaken under the business as usual scenario, the volume of disruptive possessions is proportional to the cost of the work undertaken, whether it be maintenance, renewals or enhancements;
- As the S4CS does not include details for open access train operators, it is implicitly assumed that the disruption to these operators would be in the same proportion as to the average of other train operators. Special allowance was made for the Virgin West Coast (VWC) franchise, which is also not currently included in S4CS; and
- Freight and passenger travel patterns represented in ACTRAFF and the passenger demand database MOIRA are consistent with today's travel patterns and these patterns continue in the future.

3.18 We reviewed Network Rail's possessions plans and found that the number of possessions anticipated to be required during CP4 were at the top end of the range of the number of possessions likely to be required. However we have accepted the possession plans put forward by Network Rail for the purposes of generating the forecasts, but note that in doing this we have provided Network Rail with a 'buffer' to reflect the uncertainty associated with generating a new output measure.

3.19 For the other assumptions we take the view that these are reasonable assumptions, in that they balance what can practicably be modelled with the need for sufficiently realistic results. Passenger and freight traffic will change over time, but reflecting those changes would make it difficult to compare with past performance on a like-for-like basis. We have therefore assumed consistent travel patterns across the control period.

3.20 We carefully considered the realism of the freight index which is affected by two key issues: diversionary routes and single line working. While diversionary routes are important for freight, there is still disruption to freight in using diversionary routes in that drivers need to learn new routes before they can use them. Therefore, we did not adjust the index to allow for diversionary routes. We have allowed for single line or adjacent line working for freight by assigning a "single line working (SLW) factor" weight to sections of the network. We have assigned weights to the section of routes that carry the majority of freight traffic (75%). The "SLW factor" represents the extent to which freight could still be carried using its main route whilst work was being undertaken and was applied to data used to generate the historic metric. We also allowed for increased single line

working for freight in the forecast model to allow for the improvements to single line working from planned enhancements.

3.21 The model inevitably still has limitations. Some benefits to freight will not be captured by this model, for example Network Rail's proposals for more regular timetabling of maintenance work.

3.22 Disruption from possession overruns is also not captured and so we have asked Network Rail to include this as a monitoring key performance indicator (KPI) (see Section 5 for more details).

CP4 Forecasts

3.23 The forecasts for CP4 are generated separately for maintenance, renewals and enhancements. The following tables and graphs illustrate the forecast of the indices for the three 'scenarios': business as usual, stage 1 and stage 2.

Business as usual

3.24 This scenario is included for illustrative purposes only and provides an indication of the relative amount of disruption which results from planned possessions if Network Rail did not make the proposed changes to its possession strategy, i.e. it assumes Network Rail's current possession strategy and methods of working.

3.25 For maintenance and renewals, the volume of disruptive possessions is assumed to be proportional to the cost of the work undertaken in each year of CP4, whether it be maintenance, renewals or enhancements.

3.26 Table 4 provides a trajectory for the PDI for passengers and freight.

Table 4: PDI in CP4: "Business as usual" scenario

Business as usual	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
PDI - Passenger	**1.00**	**1.21**	**1.07**	**1.05**	**0.95**	**0.91**	**0.90**
PDI - Freight	**1.00**	**1.16**	**1.05**	**1.01**	**0.94**	**0.92**	**0.92**

3.27 The indices generated from the 'business as usual' scenario closely follow the expenditure profile for CP4. This is a direct result of the assumption that the volume of work undertaken under the business as usual scenario is proportional to the cost of the work undertaken.

3.28 The freight profile for the 'business as usual' scenario is similar for maintenance and renewals (for the reasons given in para 3.26) but is different for enhancements. This is because the impact of some

enhancements, e.g. station re-modelling, on freight is likely to be limited and so the disruption caused by these is less marked.

Stage 1

3.29 Table 5 (and figures 1 and 2) provide the PDI trajectory for passenger and freight based on the forecast output from the stage 1 changes proposed by Network Rail.

Table 5 : PDI in CP4: "stage 1" scenario

Stage 1	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
PDI - Passenger	**1.00**	**1.21**	**1.02**	**0.91**	**0.84**	**0.71**	**0.73**
PDI - Freight	**1.00**	**1.16**	**1.01**	**1.20**	**1.19**	**1.12**	**1.06**

3.30 The historic passenger and freight metrics suggest that due to the scale of investment in the railway, and the resultant engineering works associated with this, the disruption to passenger and freight operators has increased steadily over the last three years. They also show the increase in maintenance and renewal activity towards the end of CP3 in 2008-09.

3.31 The reduction in disruption shown in the stage 1 scenario results from the initiatives outlined in paras 2.2 and 2.3. Network Rail's profile for scheduling renewals work causes the PDI-P to increase slightly in the last year of CP4 after an initial downward trend.

3.32 The profile for freight shows that the renewals and enhancement programmes will cause disruption to increase in 2010-11 (mainly due to increased working on weekday nights) but this will then reduce towards the end of CP4.

Figure 1:PDI - Passenger: stage 1 scenario (moving annual average)

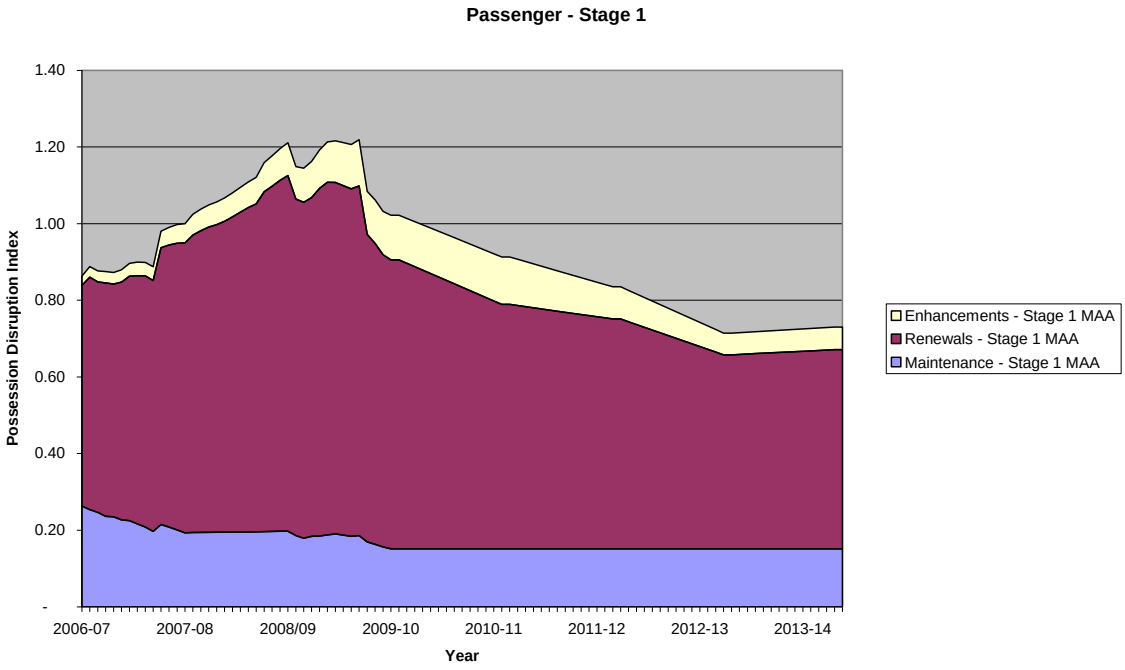
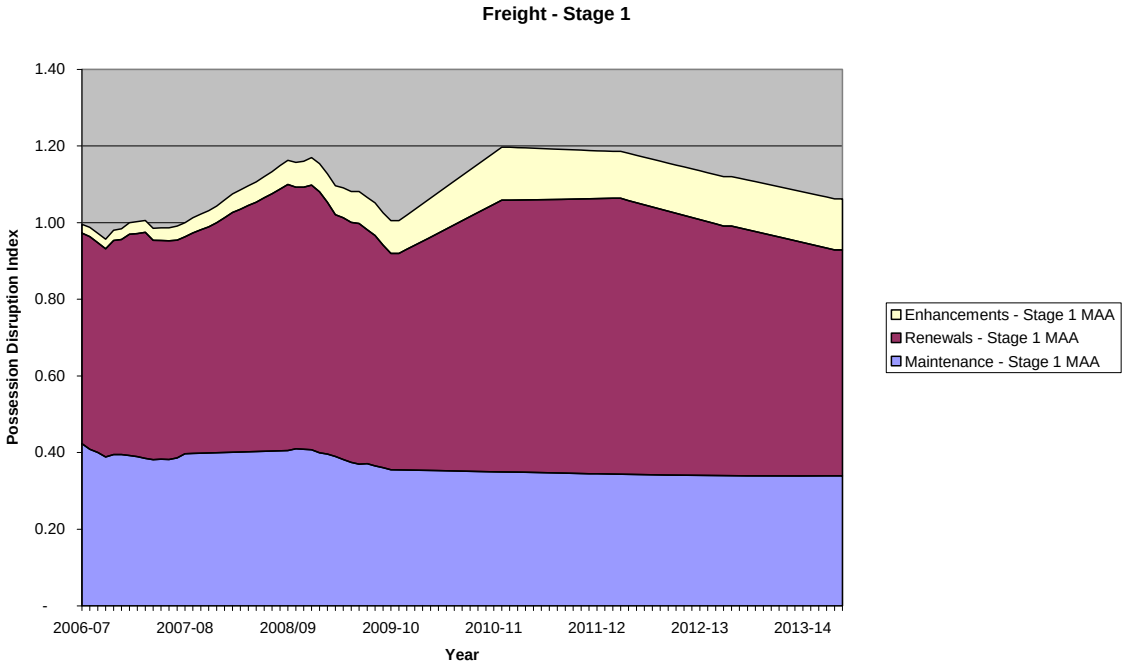


Figure 2:PDI - Freight: stage 1 scenario (moving annual average)



Stage 2

3.33 The stage 2 forecasts have been created by overlaying the stage 1 forecasts with Network Rail's assumptions on the impact of the stage 2 investment on possessions.

3.34 The incremental impact on the passenger and freight metrics has been forecast assuming that stage 2 is implemented on the eight routes that currently show a positive business case (in addition to the West Coast Mainline for which the benefits of stage 2 are assumed to be included from the start of CP4). These eight routes (which are subject to further review by Network Rail) are:

- East Coast Main Line;
- Great Eastern Main Line;
- Great Western Main Line;
- Midland Main Line;
- Bristol to Birmingham;
- Waterloo to Weymouth;
- London to Stansted; and
- South Humberside freight .

3.35 Table 6 (and figures 3 and 4) provide a trajectory for the PDI based on the forecast output from the stage 1 and stage 2 changes proposed by Network Rail.

Table 6: PDI: stage 2 scenario

Stage 2	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
PDI - Passenger	**1.00**	**1.21**	**1.02**	**0.91**	**0.83**	**0.68**	**0.63**
PDI - Freight	**1.00**	**1.16**	**1.02**	**1.21**	**1.19**	**1.13**	**1.16**

3.36 As can be seen from table 6, there is less disruption to passengers from implementation of the stage 2 than is predicted under the stage 1 scenario.

3.37 It will take some time for the benefits from stage 2 to be realised and the changes only have material impact from 2012-13 onwards.

Figure 3: PDI - Passenger: stage 2 scenario (moving annual average)

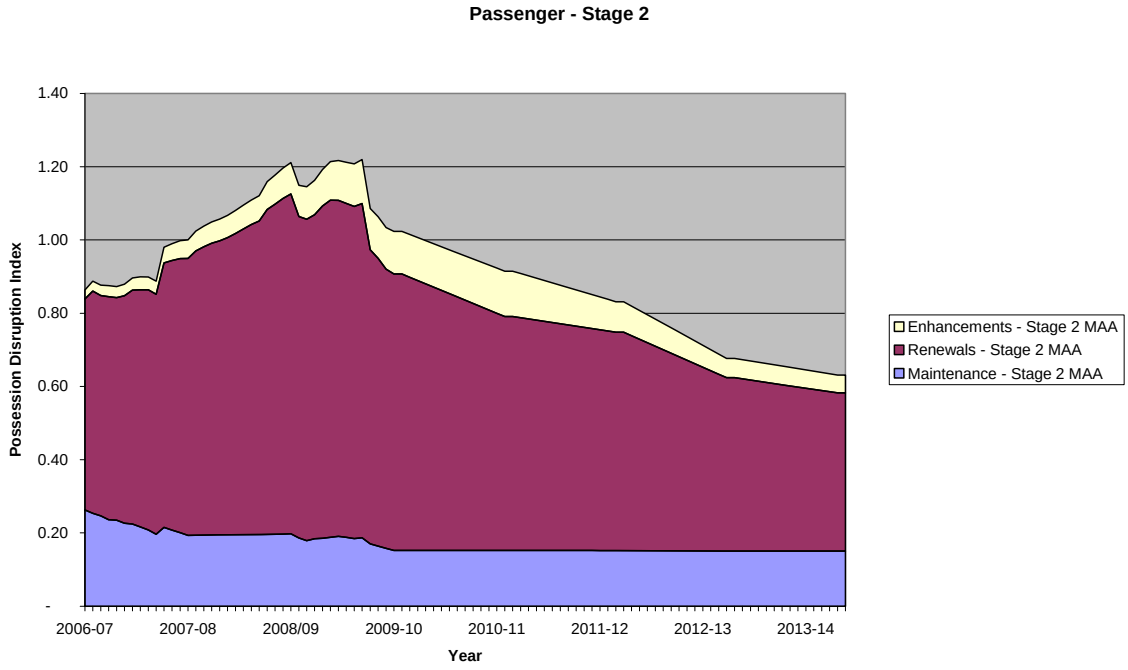
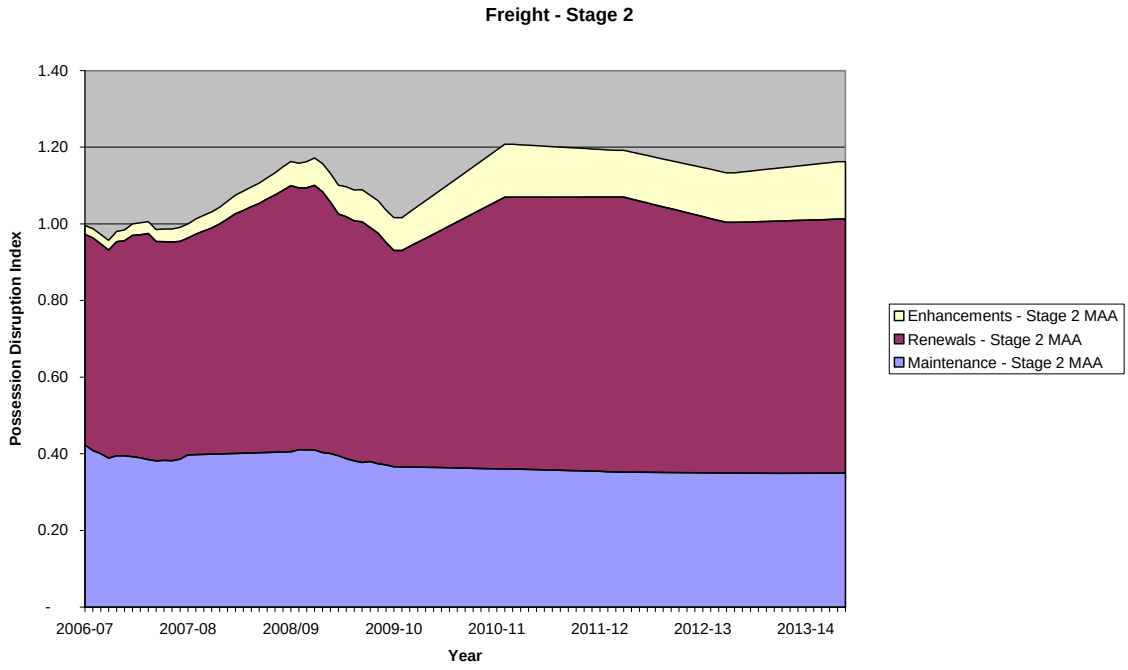


Figure 4: PDI - Freight: stage 2 scenario (moving annual average)



3.38 The model forecasts that the implementation of stage 2 will produce more disruption for freight than stage 1. This is because the stage 2 scenario assumes more mid-week night possessions and fewer weekend possessions. The historic freight movement pattern (as obtained from

ACTRAFF) provide the relative weights for these time periods and hence the model weights mid-week night disruption as much more disruptive than weekend disruption, which in turns leads to a worsening in the index. The same effect is not seen for passenger movements as there are more passengers travelling at the weekend than on weekday nights and so the same change in possessions provides a large benefit to passengers.

4 The PDI trajectories for consultation

4.1 Our draft determinations provided £160m worth of capital investment and £60m recurring expenditure during CP4 to enable those routes with the best business case to complete stage 2 in CP4. We estimate that by the end of CP4 the year-on-year recurring costs of implementing stage 2 will be around £30m. These costs are outweighed by the forecast benefits and hence we believe the changes provide value for money.

4.2 The output requirement we are establishing for passengers is shown in table 7. It takes into account the delivery of stage 1 and delivery of stage 2 on the eight routes that Network Rail regard as having the best business case. However we expect Network Rail to work with operators to refine the exact approach in terms of which routes the stage 2 investment should be implemented on and to describe this in more detail in its CP4 delivery plan[5]. Provided the regulated outputs targets are delivered, Network Rail can implement stage 2 on the routes it believes, on the basis of consultation with the industry, offer the best value for money.

Table 7: PDI regulated output trajectory for passengers (2007-08=1)

CP4	2009-10	2010-11	2011-12	2012-13	2013-14
PDI - Passenger	**1.02**	**0.91**	**0.83**	**0.68**	**0.63**

4.3 The effect of the regulated output target is to require a year-on-year reduction in disruption to passengers so that by the end of CP4 there will be a 37% reduction in disruption compared to the base year (2007-08).

4.4 The model forecasts that the changes Network Rail is planning to make in stage 1 and stage 2, whilst having significant benefits for passengers, will have an adverse impact on freight and that the size of the impact will increase between stage 1 and stage 2. We believe the modelled result is overstating the likely impact on freight and that Network Rail can manage implementation such that the index is held constant. The “single line

[5] Network Rail’s delivery plan is a document in which Network Rail must define clear deliverables and milestones for its programme of works in CP4

working" factor in the freight model may be adjusted to reflect beneficial changes in the network that, in turn, will reduce the modelled disruptive impact on freight (these changes are already captured for passengers via the Schedule 4 compensation system). We would expect Network Rail to propose changes to the "single line working" factor, after discussion with the industry, such that the impact on freight can be accurately reflected in the index.

4.5 Other benefits to freight will not be captured by the model, for example, if Network Rail brings in a midweek maintenance work cycle to 1 in 6 (once every 6 weeks) or 1 in 3 strategies on key freight routes (as outlined in their Strategic Business Plan). This will allow the creation of a 6 week rolling timetable (with the objective of 1 to 2 diversionary routes for the key freight services), reduce short term planning and enable consistent long term planning.

4.6 The output requirement we are establishing for freight is that there should be no worsening in the level of disruption currently experienced by freight operators. Table 8 shows that the PDI trajectory for freight for CP4 is therefore 1 for each year. In practice we expect freight to benefit for reasons that cannot be captured by the index and we intend to monitor this as described below.

Table 8: PDI regulated output trajectory for freight (2007-08=1)

CP4	2009-10	2010-11	2011-12	2012-13	2013-14
PDI - Freight	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

5. Monitoring

5.1 To provide a firm basis for monitoring, seven supplementary key performance indicators (KPIs) have been developed in conjunction with the PDIs. These supplementary KPIs will not form regulated targets, but are designed to:

- provide information on areas which are not fully reflected in the PDIs;
- help us understand movements in the PDIs; and
- act as a check against any perverse behaviours that might result from strategies designed to drive improvements against the PDIs.

5.2 Supplementary monitoring indicators are particularly important for new measures like the PDIs, where there is no previous experience in interpreting changes in the regulated output measure.

5.3 The supplementary KPIs are described in table 9 below. Further details on their definition and data sources are provided in SDG's November 2007 report.[6]

Table 9: ORR monitoring KPIs

	Definition
Rail replacement bus Hours	Measures the rail replacement bus service hours operated due to possessions.
Possession notification	Calculated as the number of possessions with a Notification Factor discount (NFMRE[7]) expressed as a percentage of the number of notified possessions.
Possession notification discount factor (NDF)	Percentage of possessions falling into each of the three notification factor discount thresholds.
Late possession cancellations (LPC)	Measured as the number of possessions that were cancelled after issue of the Weekly Operating Notice[8] (WON).
Possessions involving whole route blockage (WRB)	Expresses the number of possessions recorded as 'whole route blockage' as a percentage of the total number of possessions.
Delay minutes due to possession overrun (ODM)	Measured as total delay minutes attributed to possession over-runs, divided by scheduled train-km.
Cancellation minutes due to possession overrun (OCM)	Measured as total cancellation minutes attributed to possession overruns, divided by scheduled train-km.

5.4 We will also be making use of existing indicators produced by Network Rail, such as the percentage of the working timetable that is run by each train operator, to aid our understanding.

5.5 Whilst the seven supplementary KPIs provide a network wide picture, they will not provide detailed information on a route-by-route basis. We particularly want to understand the incremental contribution that the implementation of stage 2 will have on specific routes and what difference this makes towards delivery of the overall targets. We will expect Network Rail to provide information at the route level to allow us to review this. We will be discussing how this could best be achieved with Network Rail later in the year.

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[6] Network Availability Reporting Suite (NARS) - Outline Technical Specification" http://www.rail-reg.gov.uk/upload/pdf/cnslt-netwrk_avail-specrep_SDG.pdf

[7] NFMRE is a discount factor which is applied to the marginal revenue effect (i.e. the impact on train operator revenue) in Schedule 4 of the track access agreement signed by Network Rail and train operators, to reflect the amount of notice Network Rail provides train operators regarding planned possessions. The more notice which is given, the higher the discount factor.

[8] The Weekly Operating Notice is an internal railway industry publication issued on the Thursday of the week preceding the applicable week beginning at 0600 on Sunday

5.6 We also expect Network Rail to publish data on how successful it has been in producing its possessions plans to a regular timetable to allow us to monitor the potential benefits to freight.

6 Responding to this consultation

6.1 We welcome any comments on this document. We are specifically looking for your views on:

- whether the proposed improvements in the PDI-P are appropriate. Are these challenging but achievable targets for Network Rail?;
- whether the proposed approach for freight, for which the PDI-F is held constant for the control period is appropriate. Should we also establish route specific monitoring to ensure that the stage 2 investment benefits freight as well as passengers?; and
- our plans to monitor the new measures.

6.2 Responses to this consultation should be sent in electronic format (or if not possible, in hard-copy format) by 4 September 2008 to:

Sarah Warren
Team Administrator
Office of Rail Regulation
One Kemble Street
London WC2B 4AN
Tel: 020 7282 3919

Email: sarah.warren@orr.gsi.gov.uk

6.3 You should indicate clearly if you wish all or part of your response to remain confidential to ORR. Otherwise, we will make it available in our library, publish it on our website and we may quote from it. Where you make a response in confidence, you should attach a summary, excluding the confidential information, which can be treated as above. We may also publish the names of respondents in future documents or on our website, unless a respondent indicates that they wish their name to be withheld.

6.4 Copies of this document can be found in the ORR library and on the ORR website www.rail-reg.gov.uk.

6.5 We will take your responses into account for our final determinations, which we will publish on 30 October 2008.

Ends

APPENDIX

Brief history of development of the Network Availability regulated output measure

1.1 In August 2007, ORR consulted on the structure of outputs for Network Rail between April 2009 and March 2014 (CP4), which included an output for Network Availability[9].

1.2 On 21 September 2007, ORR organised a workshop for Network Rail, train operators, freight operators and representative groups to discuss the outputs for Network Rail in CP4 including the work done by consultants Steer Davies Gleave (SDG) on the development of the Network Availability measure.

1.3 On 27 September 2007, we sent a letter to industry stakeholders to highlight the publication on our website of the '*Option Assessment Report*[10] produced by the consultants Steer Davies Gleave which provided more information on the work carried out to date and sought views on this work.

1.4 In November 2007, Steer Davies Gleave (SDG) provided ORR and Network Rail with a summary report[11] describing the development of the specification of their recommended Network Availability measures.

1.5 On 14 February 2008, we published a document '*Update on the framework for setting access charges and strategic business plan assessment*[12]' which we set out our conclusions following our review of the responses received from our August 2007 consultation.

1.6 The freight measure was modified in March so that it was plotted as the reciprocal of the measure presented in the November report by SDG, i.e. the freight measure was changed to be based on unavailability rather than availability of the network.

1.7 SDG presented ORR and Network Rail with the historic metric and the initial forecasts for the Network Availability measure at the end of March 2008. SDG recommended three measures: one for passenger operations,

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[9] http://www.rail-reg.gov.uk/upload/pdf/338.pdf.

[10] http://www.rail-reg.gov.uk/upload/pdf/pr08_sdg_ntwkav-sep07.pdf.

[11] http://www.rail-reg.gov.uk/upload/pdf/cnslt-netwrk_avail-summary_SDG.pdf.

[12] http://www.rail-reg.gov.uk/upload/pdf/351.pdf.

one for freight operations and a unified measure which considered the impact of possessions on both passenger and freight operations.

1.8 We considered using SDG's unified passenger and freight measure as a top level regulated output, as this would allow Network Rail to focus on one single KPI. However, although a unified measure would fulfil that objective, by its very nature, it cannot reflect the impacts on passengers and freight in the best way and so may not incentivise Network Rail appropriately to take possessions in the least disruptive manner. We consider that SDG's individual metrics for passenger operators and freight operators would capture better the impacts felt on those sectors.

1.9 We then carried out a further review of the approach and, jointly with Network Rail, commissioned SDG in April to make some further changes. This work was completed in May 2008.

1.10 We made some further adjustments to the model developed by SDG in June 2008. The ORR adjusted model is described in Section 3.

Appendix Ends