West Coast Main Line Capacity

Initial prototype timetable

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Appendices

1. Introduction

The existing Virgin West Coast franchise and the associated track access contract held by West Coast Trains Limited are both due to expire on 1 April 2012. In the period leading up to this date, Office of Rail Regulation (ORR) is expected to receive several applications for amendments to existing or additional track access rights. These include an application from the Department for Transport (DfT) on behalf of the new franchise.

In order to manage the expected track access aspirations and associated timescales in advance of the commencement of the re-franchising process, ORR wrote to industry parties on 14th May 2010 with the primary objective of seeking to identify operators' future aspirations and requirements. In response to this exercise, of the industry stakeholders consulted, 18 expressions of interest were received by ORR. The individual responses ranged from maintaining existing rights, through to minor variations and additional track access rights.

In June 2010, ORR subsequently remitted Network Rail to review these aspirations through a three-staged approach. Stage one involved the elimination of aspirations that were deemed longer term and required significant infrastructure interventions. Stage two required the undertaking of a capacity assessment which established remaining West Coast Main Line (WCML) capacity between London Euston and Preston. This also included identification of timetabling 'trade-offs' and 'path capacity allocation criteria'; and this stage resulted in the generation of three scenarios. Stage three involved the production of a prototype timetable based on one of these scenarios.

The whole process also included 1-1 meetings between Network Rail and aspirants to discuss individual aspirations and concerns. Input was also received from Network Rail's infrastructure functional experts such as Safety, Operations and Power Supply.

2. Approach

In order to assess the implications of the proposals, using the December 2010 timetable as the base, ORR requested Network Rail on 30th June to conduct a capacity and performance assessment to determine the optimum utilisation on the WCML between London Euston and Preston (including some adjoining routes).

To understand the impact of the aspirations and determine the optimum solution, this work was split into three stages. This report summarises the analysis and key findings from each workstream:

Stage One – Filtering out the aspirations that were deemed 'longer-term' due to their requirement for significant infrastructure interventions that are unfunded and required development which fell outside the timescales of this process.

Stage Two - Capacity optioneering - this examined those aspirations which had come through from stage one and provided an interim report on how the aspirations could be accommodated on the route and any potential trade-offs that would be required.

Completion of this stage concluded that there were three potential scenarios, all with differing criteria, outputs and operational impacts; these were:

Scenario One: 1 x 125mph 'off-peak' train path per hour between London Euston and Preston,
Scenario Two: 2 x 125mph 'off-peak' train path per hour between London Euston and Preston,
Scenario Three: 1 x 110mph 'off-peak' train path per hour between London Euston and Preston.

Network Rail was concerned that Scenario Two would effectively fill the off-peak timetable and this was considered to be unsustainable from a performance point of view. Similarly, Scenario Three would have a significant impact on the operation of services, including journey times and calling patterns. Effectively, this scenario would lead to the creation of a 'non-mirror image' timetable (i.e. the return journey would have a different calling pattern to the outward journey). The analysis presented by Network Rail was used to promote discussions and guide ORR in making an informed decision as to which service scenario

was operationally practical and robust for the network. Based on the findings presented, ORR agreed that scenario one should be taken forward into the prototype timetable development stage (stage three).

Stage Three - Agreement of the scenario and remit specification (Appendix A) to develop a prototype timetable.

This has been based on the analysis and conclusions expressed in stage two and the expected output is the establishment of the criteria for one additional timetable path in each direction - per hour - between the hours of 0733 and 1533 hours (between London Euston and Preston).

Interim findings from the prototype timetable development have been analysed by Network Rail's functional experts to examine the impact on the following areas:

- Performance
- Power supply
- Maintenance
- Operations
- Safety links to other projects

Signalling and Planning Headways

The performance analysis undertaken as part of the prototype development has measured the lateness impact that the proposed 125mph path may have on existing services (in both directions) over the critical areas identified. The analysis for each signal section is based on the planning headways as specified within the current version of Rules of the Plan (RoTP).

Freight Access Rights

Network Rail recognises the importance in maintaining current freight access rights; but also appreciates that some freight access rights are not being fully optimised. Within the tight timescales available to undertake the capacity review on the West Coast Main Line, it was difficult to analyse each individual and specific freight access right. Therefore, when conflicts between the aspired scenario and freight were identified, it was important to establish how frequent the conflicts actually occur and how often the freight service utilises the actual path. Appendix C shows the actual number of freight trains running (on part of

the WCML route) as opposed to the number of times it was booked to run. This covered a period of 32 weeks (8 four-weekly periods), which helps make a quick assessment of whether the conflict is likely to occur on a regular or ad-hoc basis.

Throughout all stages of this process, Network Rail has used 1-1 meetings with stakeholders to understand more about aspirations and to share interim findings.

3. Aspiration Assessment (Stage One)

The first step of the capacity assessment examined the various aspirations received during the ORR consultation and provided an assessment of whether there was sufficient capacity to meet these aspirations. At this stage, all aspirations were considered in isolation. The analysis addressed whether there was capacity to accommodate an aspiration without either requiring changes to existing operator rights outside the WCML area or changes to the infrastructure capability. If either of these conditions were not met, then the aspiration was not taken forward to the stage two assessments.

The purpose of this stage was to remove aspirations that could not be delivered in April 2012 and therefore would not be included in the prototype timetable development. Any aspirations which were eliminated by the stage one filter were discussed with aspirants through 1-1s, and the necessary route for further work discussed and identified.

Table 1 below highlights the aspirations which were examined and filtered out at this stage.

Table 1 - Filtered aspirations

Service Descriptive	**Aspiration for additional services on the following route sections**
Regional – non London	Coventry - Nuneaton
Regional – non London	Wolverhampton – Walsall
Regional – non London	Manchester - Altrincham/Chester Line
Regional – non London	Bletchley - Milton Keynes Central
LDHS – non London	Birmingham - Leamington Spa via Coventry
Regional – London suburban	London – Northampton

4. Capacity Assessment (Stage Two)

4.1. Approach

The first step of the capacity assessment examined the various aspirations filtered out from stage one and provided an assessment of whether there was capacity for all the aspirations that gave overall best value.

The WCML was split into sections or groupings of services to assess the various ways in which the aspirations could be accommodated on the route. The December 2010 timetable was used as the base for this study and was aligned with the remit prepared by ORR on the 30 June 2010. Substantial restructuring of the December 2010 timetable is outside the scope of this study.

The analysis evaluated the capacity of the route by examining the capacity consumed by the December 2010 timetable and then considering how the residual capacity could best be utilised to meet aspirations. Different combinations of aspirations and potential capacity trade-offs were considered as part of this analysis.

This optioneering was conducted to inform the development of the service specification for development of the prototype timetable. Through this stage, detailed analysis was generally not undertaken on platforming, destination locations or detailed freight paths in each hour. There is a risk, therefore, that as more detailed timetabling is undertaken, the number or type of services might alter.

4.2. Assumptions

The optioneering carried out was underpinned by the following assumptions:

- no changes to the infrastructure were assumed in the baseline for this study as the proposed date of change is December 2012

- the optioneering work only considered track capacity and assumed that power supply is sufficient to operate additional services. (This is discussed separately in section 7.2.)

- existing rolling stock was assumed for all current services in December 2010 timetable

- for optioneering the following assumptions on aspirants' rolling stock were adopted by Network Rail:

LDHS 125mph tilting	Class 390
LDHS 110mph non-tilting	Current High Speed Measurement Train (HSMT) timings have been used.

4.3. Service Types

Long Distance High Speed (LDHS)

London based services : LDHS services are those which connect London Euston with various major towns and cities in the West Midlands, North West, Wales and Scotland.
Non-London based services : Non-London LDHS refer to long distance services which use the WCML for part of their route, but do not operate to or from London Euston.

Regional Passenger

London suburban services : These services only operate on the south end of the route, but have a variety of calling patterns and origin/destinations.
Non-London regional services : These are short distance and medium distance services that operate over parts of the WCML.

Freight

There is a mixture of freight services that use the WCML for either part of, or their entire journey. For the purpose of the optioneering analysis, freight trains were split into Class 4 and Class 6. Class 4 is 75mph-capable freight train (up to 1600 tonnes trailing load) and this includes intermodal container traffic and empty coal services. Class 6 is 60mph-capable freight train includes coal and aggregate traffic and generally carries heavier loads. A number of freight aspirations were received both from developers and freight operators. It was difficult to identify the exact quantity of paths required as these were generally expressed as overall volume growth rather than on a train specific basis.

All work on aspirations used the December 2010 timetable as a base, so existing freight paths are taken into account. To understand the requirement for future freight paths, Network Rail has used the industry Strategic Freight Network (SFN) freight forecasts.

4.4. Stage 2 Optioneering Findings

Stage Two used the December 2010 timetable as the working base and evaluated the aspirations which could be accommodated and the possible capacity trade-offs. A criteria for the suggested path(s) was specified in respect to rolling stock and calling patterns.
The findings are split into fast and slow lines.

4.4.1 Fast Lines

- **LDHS Euston to Crewe :** there is insufficient capacity within the December 2010 timetable structure to accommodate all the aspirations against the capability contained within the 2009 Rules of the Plan (planning headway permits a planning capability limit of 13tph).

- **Scenario Tables – off-peak :** Tables 2 – 7 show the potential use of paths between Euston and Crewe; the train characteristics needed to use the path, and identified conflicts with other existing services. The lists of potential calls in additional services are by no means exhaustive; the stopping patterns given are the maximum reasonably possible within the December 2010 timetable structure. In some cases, faster services could be pathed through further rationalisation of the stopping patterns described.

  110mph paths cannot call at Milton Keynes Central in both directions. A stop is required for pathing purposes in the Down direction, but cannot be accommodated in the Up direction.

Key to Scenario Tables (2-7)

	Dec 2010 EPS Path
	Possible additional Fast Line path
	Dec 2010 train moved to different path

Table 2 Scenario for one additional 110mph path (Down direction)

Euston Depart	Calls on core WCML Fast Lines (south of Colwich)	Must Vacate Fast Lines At	First Stop Beyond Colwich or WCML FL	Required Traction Capability	Number of Spare Hours (Dec 2010)	First	Last	Excluding	Freight Path Conflicts	Stafford Conflicts
xx:00	None		Stoke-on-Trent	EPS 125mph						
xx:03	Rugby		Coventry	EPS 125mph						
xx:07	None		Stafford	EPS 125mph						
xx:10	Milton Keynes Central		Crewe	EPS 125mph						
xx:13	Leighton Buzzard (SL)	Ledburn Junction	SL Stations to Northampton	100 mph						
xx:20	Milton Keynes Central		Stoke-on-Trent	EPS 125mph						
xx:23	Watford Junction		Coventry	EPS 125mph						
xx:30	None		Warrington Bank Quay	EPS 125mph						
xx:33	**Possible to call at Milton Keynes Central, Tamworth Low Level, Lichfield Trent Valley**	**Milton Keynes Central (for xx:40 to overtake), Amington Junction**	**At least Hartford**	**110mph**	**7 (if HSMT (TWO) put into same path as existing 13:33 FO departure, otherwise 6)**	**08:33**	**15:33**	**13:33**	**14:33 with 4M58 at Brinklow, 15:33 with 4M88 at Colwich. None at Whitehouse Jn.**	**Requires re-platforming of 1tph at Stafford**
xx:40	None		Crewe	EPS 125mph						
xx:43	Milton Keynes Central		Coventry	EPS 125mph						
xx:46	Watford Junction, Milton Keynes Central	Milton Keynes Central Platform 5	Northampton	100 mph						

Table 3 Scenario for one additional 110mph path (Up direction)									
Euston Arrive	**Calls on core WCML Fast Lines (South of Colwich)**	**Can Join Fast Lines From**	**Last Stop Before Colwich or WCML FL**	**Required Traction Capability**	**Number of Spare Hours (Dec 2010)**	**First**	**Last**	**Excluding**	**Conflicts**
xx:01	None		Crewe	EPS 125mph					
xx:07	None		Warrington Bank Quay	EPS 125mph					
xx:13	Rugby		Coventry	EPS 125mph					
xx:21	Milton Keynes Central		Stoke-on-Trent	EPS 125mph					
xx:27	Leighton Buzzard (SL)	Ledburn Junction	SL stations from Northampton	100 mph					
xx:30	**Possible to call at one of {Lichfield Trent Valley or Tamworth Low Level}**	**Amington Junction**	**At latest Hartford**	**110 mph**	**9**	**09:30**	**21:30**	**14:30 (HSMT path), 17:30, 18:30, 19:30**	**09:30 with 4O88 at Colwich, 10:30 with 4L97 at Colwich, 12:30 with 4M34 at Colwich, 21:30 with 4A23 at Colwich**
xx:33	Watford Junction		Coventry	EPS 125mph					
xx:36	Milton Keynes Central		Crewe	EPS 125mph					
xx:39	None		Stoke-on-Trent	EPS 125mph					
xx:49	Milton Keynes Central (SL), Watford Junction	Ledburn Junction	Northampton	100 mph					
xx:52	Milton Keynes Central		Coventry	EPS 125mph					
xx:55	None		Stafford	EPS 125mph					

Table 4 Scenario for one additional 125mph path (Down direction)									
Euston Depart	**Calls on core WCML Fast Lines (South of Colwich)**	**Must Vacate Fast Lines At**	**First Stop Beyond Colwich or WCML FL**	**Required Traction Capability**	**Number of Spare Hours (Dec 2010)**	**First**	**Last**	**Excluding**	**Freight Path Conflicts**
xx:00	None		Stoke-on-Trent	EPS 125mph					
xx:03	Rugby		Coventry	EPS 125mph					
xx:07	Stafford		Stafford	EPS 125mph					
xx:10	Milton Keynes Central		Crewe	EPS 125mph					
xx:13	Leighton Buzzard (SL)	Ledburn Junction	SL stations to Northampton	100 mph					
xx:20	Milton Keynes Central		Stoke-on-Trent	EPS 125mph					
xx:23	Watford Junction		Coventry	EPS 125mph					
xx:30	None		Warrington Bank Quay	EPS 125mph					
xx:33	**Possible to call at one of {Watford Junction or Milton Keynes Central}, two of {Rugby, Nuneaton, Tamworth Low Level, Lichfield Trent Valley}**	**Amington Junction (if calling at TAM or LTV)**	**At least Crewe**	**EPS 125mph**	**7 (if HSMT (TWO) put into same path as existing 13:33 FO departure)**	**08:33**	**15:33**	**13:33**	**08:33 with 4H22 at Brinklow, 10:33 with 4M50 at Colwich, 11:33 with 4S44 at Brinklow, 12:33 with 4M94 at Brinklow, 15:33 with 4M23 at Brinklow and 4M81 at Colwich. None at Whitehouse**
xx:40	None		Crewe	EPS 125mph					
xx:43	Milton Keynes Central		Coventry	EPS 125mph					
xx:46	Watford Junction, Milton Keynes Central	Milton Keynes Central Platform 5	Northampton	100 mph					

Table 5 Scenario for one additional 125mph path (Up direction)									
Euston Arrive	**Calls on core WCML Fast Lines (South of Colwich)**	**Can Join Fast Lines From**	**Last Stop Before Colwich or WCML FL**	**Required Traction**	**Number of Spare Hours (Dec 2010)**	**First**	**Last**	**Excluding**	**Conflicts**
xx:01	None		Crewe	EPS 125mph					
xx:10	Possible to call at two of {Lichfield Trent Valley, Tamworth Low Level, Nuneaton, Rugby}, one of {Milton Keynes Central, Watford Junction}		At latest Crewe	EPS 125mph	8	09:10	19:10	16:10, 18:10, HSMT path	09:10 with 4O14 and 1H06 at Colwich, 13:10 with 1A01 at Colwich, 14:10 with 6L42 at Colwich, 19:10 with 4O29 at Colwich. Flexing required to CRE-EUS local service between STA and NMP
xx:13	Rugby		Coventry	EPS 125mph					
xx:21	Milton Keynes Central		Stoke-on-Trent	EPS 125mph					
xx:27	Leighton Buzzard (SL)	Ledburn Junction	SL stations from Northampton	100 mph					
xx:30	None		At latest Preston	EPS 125mph	9	09:30	21:30	14:30 (HSMT path), 17:30, 18:30, 19:30	11:30 with 4O35 at Colwich, 12:30 with 4L75 at Colwich, 13:30 with 6O60 at Colwich, 15:30 with 4O26 at Colwich, 20:30 with 6L56 at Colwich
xx:33	Watford Junction		Coventry	EPS 125mph					
xx:36	Milton Keynes Central		Crewe	EPS 125mph					
xx:39	None		Stoke-on-Trent	EPS 125mph					
xx:49	Milton Keynes Central (SL), Watford Junction	Ledburn Junction	Northampton	100 mph					
xx:52	Milton Keynes Central		Coventry	EPS 125mph					
xx:55	None		Stafford	EPS 125mph					

Table 6 Scenario for two additional 125mph paths (Down direction)									
Euston Depart	**Calls on core WCML (South of Colwich)**	**Must Vacate Fast Lines At**	**First Stop Beyond Colwich or WCML FL**	**Required Traction**	**Number of Spare Hours (Dec 2010)**	**First**	**Last**	**Excluding**	**Freight Path Conflicts**
xx:00	None		Stoke-on-Trent	EPS 125mph					
xx:03	Rugby		Coventry	EPS 125mph					
xx:07	Stafford		Stafford	EPS 125mph					
xx:10	Milton Keynes Central		Crewe	EPS 125mph					
xx:13	Leighton Buzzard (SL)	Ledburn Junction	SL Stations to Northampton	100 mph					
xx:20	Milton Keynes Central		Stoke-on-Trent	EPS 125mph					
xx:23	Watford Junction		Coventry	EPS 125mph					
xx:30	None		Warrington Bank Quay	EPS 125mph					
xx:33	**Possible to call at one of {Milton Keynes Central or Rugby}, two of {Nuneaton, Tamworth, Lichfield Trent Valley}**		**At least Crewe**	**EPS 125mph**	**7 (if HSMT (TWO) put into same path as existing 13:33 FO departure)**	**08:33**	**15:33**	**13:33**	**08:33 with 4M86 at Brinklow, 10:33 with 4M50 at Colwich, 14:33 with 4H17 at Brinklow and 4L92 at Whitehouse, 15:33 with 6K50 at Colwich**
xx:36	**Possible to call at Milton Keynes Central**	**Milton Keynes Central (if stopping, to allow 10:40 to overtake)**	**At least Crewe**	**EPS 125mph**	**7**	**08:36**	**15:36**	**13:36 OR 15:36**	**08:36 with 4H22 at Brinklow, 09:36 with 4M34 at Whitehouse, 10:36 with 4M50 at Colwich, 11:36 with 4S44 at Brinklow, 12:36 with 4M94 at Brinklow, 13:36 with 4M54 at Brinklow, 14:36 with 4M44 at Whitehouse, 15:36 with 4M23 at Brinklow and with 4M81 at Colwich.**
xx:40	None		Crewe	EPS 125mph					
xx:43	Milton Keynes Central		Coventry	EPS 125mph					
xx:46	Watford Junction, Milton Keynes Central	Milton Keynes Central Platform 5	Northampton	100 mph					

Table 7 Scenario for two additional 125mph paths (Up direction)									
Euston Arrive	**Calls on core WCML Fast Lines (South of Colwich)**	**Can Join Fast Lines From**	**Last Stop Before Colwich or WCML FL**	**Required Traction**	**Number of Spare Hours (Dec 2010)**	**First**	**Last**	**Excluding**	**Conflicts**
xx:01	None		Crewe	EPS 125mph					
xx:08	**Possible to call at Milton Keynes Central**			**EPS 125mph**	**9**	**09:10**	**19:10**	**16:10, 18:10**	**None - re-use of existing path**
xx:13	Rugby		Coventry	EPS 125mph					
xx:21	Milton Keynes Central		Stoke-on-Trent	EPS 125mph					
xx:27	Leighton Buzzard (SL)	Ledburn Junction	SL stations to Northampton	100 mph					
xx:30	**Possible to call at two of {Lichfield Trent Valley, Tamworth, Nuneaton}, Milton Keynes Central**		**At latest Crewe**	**EPS 125mph**	**9**	**09:30**	**21:30**	**14:30 (HSMT path), 17:30, 18:30, 19:30**	**09:30 with 4O88 at Colwich, 10:30 with 4L97 at Colwich, 12:30 with 4M34 at Colwich, 21:30 with 4A23 at Colwich**
xx:33	Watford Junction		Coventry	EPS 125mph					
xx:36	Milton Keynes Central		Crewe	EPS 125mph					
xx:39	None		Stoke-on-Trent	EPS 125mph					
xx:49	Milton Keynes Central (SL), Watford Junction	Ledburn Junction	Northampton	100 mph					
xx:52	Milton Keynes Central		Coventry	EPS 125mph					
xx:55	None		Stafford	EPS 125mph					
xx:58	None		At latest Preston	EPS 125mph		09:58	19:58	12:58, 15:58, 17:58 (Already used for this purpose)	16:58 with 6F02 at Colwich, requires 1tph LIV-BHM to use SL CRE to STA

- **Scenario Tables – peak:** spare paths are generally only available in the off-peak. The Fast Lines are used to maximum planning capacity (13 tph) during the peaks hours with one additional service accommodated at the London end of the route in the am peak period.

- Tables 8 and 9 show the Fast Line usage in the am and pm peak.

Table 8 PM Peak departures from Euston

Euston Depart	Calls on core WCML Fast Lines (South of Colwich)	Must Vacate Fast Lines At	First Stop Beyond Colwich or WCML FL	Required Traction
17:00	None		Stoke-on-Trent	EPS 125mph
17:03	Rugby		Coventry	EPS 125mph
17:07	None		Stafford	EPS 125mph
17:10	Milton Keynes Central, Nuneaton		Crewe	EPS 125mph
17:13	Leighton Buzzard (SL)	Ledburn Jn	SL stations to Northampton	**100mph**
17:20	Milton Keynes Central		Stoke-on-Trent	EPS 125mph
17:23	Watford Junction		Coventry	EPS 125mph
17:30	None		Warrington Bank Quay	EPS 125mph
17:33	Rugby		Stafford	EPS 125mph
17:40	None		Crewe	EPS 125mph
17:43	Milton Keynes Central		Coventry	EPS 125mph
17:46	Leighton Buzzard (SL)	Ledburn Jn	SL stations to Northampton	**100mph**
17:57	Tamworth Low Level, Lichfield Trent Valley		Warrington Bank Quay	EPS 125mph

Table 9 AM Peak arrivals at Euston

Euston Arrive	Calls on core WCML Fast Lines (South of Colwich)	Can Join Fast Lines From	Last Stop Before Colwich or WCML FL	Required Traction
08:02	Leighton Buzzard (SL)	Bourne End Jn	SL stations from Northampton	**100mph**
08:08	Nuneaton		Crewe	EPS 125mph
08:14	Leighton Buzzard (SL)	Ledburn Jn	SL stations from Northampton	**100mph**
08:16	Milton Keynes Central		Coventry	EPS 125mph
08:19	Rugby		Stoke-on-Trent	EPS 125mph
08:22	Lichfield Trent Valley, Tamworth Low Level		Stafford	EPS 125mph
08:30	None		Coventry	EPS 125mph
08:33	Nuneaton		Crewe	EPS 125mph
08:39	Leighton Buzzard (SL)	Ledburn Jn	SL stations from Northampton	**100mph**
08:42	None		Birmingham New Street	EPS 125mph
08:46	Rugby		Stoke-on-Trent	EPS 125mph
08:49	None		Coventry	EPS 125mph
08:52	None		Stafford	EPS 125mph
08:58	None		Stockport	EPS 125mph

- **Alternative Scenarios**

Further LDHS paths between Euston and Rugby could be accommodated in each hour through more significant alteration to the December 2010 timetable and requiring some trade-offs which would impact on either the aspiration or an existing service. Table 10 summarises these scenarios.

Table 10 Additional scenarios and possible trade-offs

Additional paths	Trade-off required	Cost
2 x 125mph paths	Loss of xx:46 call at Watford Junction in suburban service	The Watford Junction call cannot be replaced
2 x 125mph paths	Re-route suburban service to the Slow Line	8 minute journey time extension to Euston – Northampton service and decrease in freight paths on the Slow Line south of Northampton
1 x 110mph path and 1 x 125mph path	Loss of xx:46 call at Watford Junction in suburban service	The Watford Junction call cannot be replaced
2 x 125mph path	Up Watford Junction call moved to the Slow Line	Lose 2 standard freight paths, 1/2 minute journey time extension Northampton – Euston service

The scenarios for LDHS examined between Euston and Crewe have found potential conflicts with existing freight traffic. Two sections have been examined in more detail to understand the impact on potential freight growth:

- **Brinklow to Attleborough**

Conflicts exist between some of the identified passenger paths and existing freight services. However, the daytime level of freight services can be accommodated with these additional passenger paths if sufficient flex can be applied (contractually and without the need to amend origin and destination arrival and departures times). However, additional passenger paths cannot be provided over this section in evening hours (i.e. for a 19:33 or later Euston departure) in the Down direction, if desired level of freight capacity is to be maintained (as per 2003 Strategic Rail Authority's Strategy for the WCML).

- **Colwich to Milford and Brocton/Whitehouse**

This section is less constrained than Brinklow to Attleborough, as it is a shorter section with fewer trains passing. Consequently, a timetable that works between Brinklow and Attleborough should also be workable between Colwich and Milford. Extra passenger paths will generally conflict with freight services, but required daytime capacity is theoretically achievable; although a number of junction conflicts occur at Whitehouse Junction when running two additional passenger paths. Dependant on which hour, additional timetabling

analysis may be required to robustly optimise capacity in this section. It is anticipated that this timetabling analysis would be undertaken during the Track Access application process.

4.4.2 Slow Lines

This section examines aspirations to run other additional or amended services to those in the December 2010 timetable.

- **Aspirations for maintaining current situation:** a number of aspirants highlighted that journey times and calling patterns should be maintained as part of this process. As the December 2010 timetable has been used as a base, this is assumed to be a 'given'. If any options require alteration to existing services, these are described in the capacity trade-offs.

- **Non-London LDHS:** the aspirations for Non-London LDHS are to achieve the best possible journey times between Birmingham and Manchester whilst maintaining the current routing of services. However, improved journey times will not be achievable without a fundamental re-structure of the December 2010 timetable, as current journey times are constrained by the present service structure.

- **London suburban:** additional service aspirations were received for London suburban routes – see table 11. The aspiration to increase the service on the DC Lines between Euston and Watford Junction to 4tph is achievable within the current timetable structure.

Table 11 London suburban aspirations for additional services

Service Descriptive	Aspiration for additional services on the following route sections
London Suburban	Euston – Watford Junction (DC Lines)
London Suburban	South Croydon – Milton Keynes

The DC Lines timetable is independent of the Fast Line timetable between Euston and Camden as the routes taken by trains are completely segregated between these points. The DC Lines timetable is only dependent on the level of service on the Slow Lines, within which suitable timings for an even 4tph service are available (subject to some re-platforming at Euston), and have been taken forward into detailed timetabling work.

There is also an aspiration to increase the frequency of South Croydon to Milton Keynes Central services. If detailed timings show that operating an increased frequency on this service is unfeasible, terminating at Watford Junction instead is likely to be unworkable, due to lack of crossing paths for trains to terminate in Platform 10. Terminating at Tring instead is a potential compromise, using the central turnback.

4.5 Specification for Prototype Timetable Development

The interim report compiled by Network Rail in stage two presented ORR with the initial findings of the optioneering stage. The report was then used to promote discussions and guide ORR in making an informed decision as to which service scenario would be most operationally practical and robust for the network.

Based on the findings presented, ORR agreed that scenario one should be taken forward into the prototype timetable development stage (Stage Three).

5. Prototype Timetable Development (Stage Three)

5.1 Remit

After discussions between Network Rail and ORR, the remit was published by ORR on 19th August 2010. This set out the specification to be taken forward and developed into a prototype timetable. Using the December 2010 timetable as the base, it included the following:

- Initially a Class 221T timing load was suggested as it was agreed this was the worst case scenario giving more generous timing flexibility. However, some paths proved difficult to time using a 221T timing load; primarily in the south bound direction.

- One SX off-peak hourly departure from Euston to Preston, departing Euston at xx:33 hours between and including 07:33 to 15:33 hours. Return services are to arrive in London hourly, following the morning peak. Services are to be timed as Timing Load 221T. Services are to call at Milton Keynes Central, Rugby, Nuneaton and Crewe (if appropriate).

- The following destinations to be considered during development, as a deviation from the base path above:

    - Extension to Lancaster, calling at Warrington Bank Quay, Wigan North Western and Preston
    - Extension to Blackpool (from Preston)
    - Extension to Bradford Interchange (from Newton-le-Willows)
    - Extension to Leeds (from Crewe) via Heaton Norris
    - Extension to Blackburn (from Wigan North Western).

- Extension of the xx:30 Euston – Lancaster services to Glasgow with equivalent Lancaster – Euston services to start at Glasgow, excluding the potential 19:40 hours service from Glasgow Central. The existing calling pattern is to be retained and consideration will need to be given to unit balancing.

- A timetable consisting of 4tph on the DC Lines has been constructed which assumes that Bakerloo line services can be re-timed as necessary. Platforming at Euston has not been examined as part of this study.

- Existing freight services to be retained and re-timed if necessary within current agreed track access rights. Increase in freight services to be in line with the Strategic Freight Network growth forecasts for 2019.

- A commentary to be given on the feasibility of including additional Lockerbie and Motherwell calls on the WCML.

5.2 Initial Timetable Investigation

Further investigation of the current timetable highlighted the following issues within the remit:

- The initial analysis, which was undertaken using a Class 390 timing load and replacing this with a 221T timing load, lengthens some of the SRTs. For the xx:33 Down path this additional time between Euston and Milton Keynes means that stopping at Milton Keynes necessitates the addition of pathing time into the following Euston – Manchester Piccadilly service, resulting in this service arriving into Manchester Piccadilly two minutes later than in the December 2010 timetable. It was recognised that the re-timing of the Euston – Manchester would necessitate the consequential re-timing of up to 30 other services in the Manchester station area. Fully assessing the impact of the consequential re-timings within the timescales available is unachievable therefore further work would be required. The timetable described in this analysis has been timed with a 221T timing load with the stop at Milton Keynes removed, but with sufficient pathing time between Milton Keynes and Nuneaton for the stop to be re-inserted. Planning a service on Class 390 timings would allow the train to stop at Milton Keynes without impacting the Euston – Manchester train.

- As a general comment, if a Class 390 was used in the Up direction it would be possible to call at Milton Keynes Central and regain the timings in the prototype timetable by Ledburn Junction. This is possible as a result of the slightly shorter SRTs that the Class 390 has compared to the 221T, plus the removal of some pathing time that is in the 221T path. Whilst a path using a Class 390 has not been looked at in detail, an initial assessment indicates using Class 390 timings allows the path to run on the Fast Line from Crewe to Nuneaton. This prevents the Class 390 having to use the Slow Line for the section between Crewe and Stafford (as per the 221T path which has been developed).

- The 17:40 path from Glasgow Central, into which the Preston – Euston path would be back-timed, is occupied by the 17:40 Glasgow – Birmingham New Street service. Subsequently the ORR asked Network Rail to examine the possibility of using the 17:40 slot for the Lancaster – Euston extension and, the current 17:40 Glasgow – Birmingham to

be re-timed using the 18:00 slot departing Glasgow. There was insufficient time to evaluate this fully within the original timescales but a high level view is discussed in section 5.9.1.

- It should be noted that the findings here reflect the December 2010 timetable as of 10th August 2010. Any amendments to timings since this point have not been updated in the base timetable around which the capacity analysis in the section has been based.

In the sections that follow the issues highlighted in the tables are colour coded as 'green', 'yellow' or 'red' where 'green' denotes the conflict identified has been resolved, 'red' denotes the conflict cannot be resolved and 'yellow' denotes further work is required to understand whether or not the conflict can be resolved.

5.3 Findings – Additional Down Paths (WCML Euston – Lancaster)

The following generic issues were found:

- It is necessary to have a dwell time of five minutes in Rugby station to allow for the following Euston – Manchester service to pass;
- It has been necessary to insert pathing time at Norton Bridge due to the CrossCountry service from the southwest/Birmingham to Manchester turning from the Down Slow Line to the Potteries route towards Stone, one minute before the new xx:33 path;
- The stop at Crewe has been omitted due to problems fitting this into the Up path (see 5.4).

Table 12 details the specific issues for each hourly path.

Table 12 Specific issues (xx33 departure from Euston)

Path	Issues
0733	For 07:33 path to be available requires the Milton Keynes stop to be removed from 07:35 Euston – Manchester Piccadilly so that the Manchester train can depart Euston at 07:40
	Path occupied between Crewe and Weaver Junction by 1Q23 (WO) NR measurement train – this would need re-timing
	Conflict with 6S94 at Warrington – freight would need to be re-platformed and flexed to allow xx:33 path
	Conflict with 1C51 (xxx; Preston to Barrow) – xx:33 path has been held at Preston station to run behind xxx service to Lancaster
0833	Brinklow to Attleborough – conflict with 4H22 (MO) – if 4H22 can run in its MSX timings on a Monday then this is resolved
	Conflict with 1V49 (Xxxxx; Manchester to Bristol) at Stafford – re-platforming 1V49 resolves issue
	Minor headway issue with 0F60 leaving Acton Bridge 1½ mins behind xx:33 – can be resolved through slight flexing of 0F60

	Path occupied by 4S28 between Warrington and Lancaster – 4S28 will need flexing
0933	4F87 scheduled to join two track section north of Winsford ½ minute after xx:33 path – timings will need flexing
	4F59 occupies xx:33 path Hartford to Walton Old Junction – timings will need flexing
	4S78 runs less than RotP headway behind xx:33 between Warrington and Winwick – can be resolved by flexing 4S78 between Warrington and Preston
1033	Conflict with 4M50 between Colwich and Whitehouse Jn – resolvable by flexing 4M50
	Path occupied by 1Q23 NR Measurement Train between Winsford and Weaver Jn – 1Q23 will need re-timing
	Minor headway issue with 0F02 joining two track section at Winsford 1½ mins behind xx:33 – can be resolved through slight flexing of 0F02
	xx:33 path conflicts with 4S42 between Weaver Jn and Preston – 4S42 will need flexing
	xx:33 path catches 4S61 between Balshaw Lane and Preston
	Within minimum headway behind 1C73 (xxxx; Preston to Windermere) between Preston and Lancaster – resolved through extending dwell of xx:33 at Preston station
1133	Junction margin conflict with 1Q27 NR Measurement Train at Stafford – 1Q27 will need re-timing
	Minor headway issue with 4C77 leaving Acton Bridge 1½ mins behind xx:33 – can be resolved through localised tweaking of xx:33 path Conflict with path of 4S05 between Winsford and Wigan
	Conflict with path of 4S04 between Euxton Jn and Lancaster
	Within minimum headway behind 1C53 (xxxx; Preston to Barrow) between Preston and Lancaster – resolved through extending dwell of xx:33 at Preston
1233	Conflict with 4M94 between Brinklow and Attleborough – resolvable by flexing 4M94 6C19 may need minor re-timing in Warrington area due to joining WCML at Acton Grange Jn less than RotP headway behind xx:33
	Path of xx:33 and 4S44 conflict in multiple locations between Acton Grange Jn and Preston
1333	Conflict with 4M81 at Brinklow – both trains scheduled to pass at same time
	Conflict with 1V59 (Xxxxx; Manchester to Paignton) at Stafford – re-platforming 1V59 resolves issue
	Conflict with 6C19 between Preston and Lancaster – however it is noted that this conflict also appears to affect the existing 1333 FO Euston – Lancaster
1433	4O28 scheduled to cross from SL to FL at Stafford ½ min after xx:33 passes conflicting with path of xx:33
	Path of xx:33 and 4S54 conflict in multiple locations between Acton Grange Jn and Balshaw Lane
	Within minimum headway behind 1C77 (xxxx; Preston to Windermere) between Preston and Lancaster – resolved through extending dwell of xx:33 at Preston
1533	Conflict with 4M87 at Brinklow – 4M87 scheduled to pass ½ min after xx:33
	Conflict with path of 1Q27 (both TO and WO) less than minimum headway behind xx:33 at Nuneaton
	Conflict with 6F73 between Hartford Jn and Weaver Jn – xx:33 less than minimum headway behind 6F73
	xx:33 catches 6F61 at Acton Grange Jn (where 6F61 turns off) – resolved by moving pathing time around in schedule of xx:33 near Warrington
	2F56 and xx:33 scheduled to cross at same time Springs Branch Jn – conflict resolved as a result of local adjustment to xx:33 mentioned above
	Within minimum headway behind 1C55/1C79 (TPE; Preston to Barrow/Windermere) between Preston and Lancaster – resolved through extending dwell of xx:33 at Preston

5.4 Findings – Additional Up Paths (WCML Lancaster - Euston)

The following generic issues were found:

- Due to a direct clash every hour between Lancaster and Preston with a xxx service, it would be necessary to depart Lancaster earlier and then include pathing time after Preston in order to fit into the available path on the southern section of the WCML between Rugby and Euston;

- This path was back timed from an xx:30 arrival at London Euston. The resulting time of presentation at Crewe is such that it is not possible to platform the Up path and the stop here has therefore been omitted;

- The path is followed out of Crewe by a Manchester to Euston service which, due to the slower 221T timing load, would close below minimum RotP headway behind the Up path before Stafford. The Up path therefore needs to cross from the Fast Line to Slow Line south of Crewe station and run Slow Line to Stafford No 5 where it moves back to the Fast Line;

- The new Up path joins the Fast Line at Stafford three minutes behind the Manchester-Euston train and three minutes in front of the Glasgow to Euston train. These three trains continue at this margin until Nuneaton where the new Up path is to call. Due to the two additional minutes being required in the schedule of the Up path to allow for slowing to cross to the Slow Line north of Nuneaton, the headway of the Glasgow train following would be below the minimum headway of three minutes. To maintain the required headway would require two minutes pathing time to be added into the schedule of Glasgow to Euston services, resulting in the arrival time at Euston being two minutes later than at present. It must be noted that this consequential re-timing impacts on existing services in the base timetable. This is achievable without impacting on following Fast Line services;

- The Up path has to run on the Slow Line between Nuneaton and Rugby to allow the path to fit into the exiting WCML Fast Line services;

- At Rugby the Xxxxxxx Birmingham to Euston service will need to use platform 6 rather than platform 5, in order to allow the new Up path to use platform 5;

- In the majority of hours the Wolverhampton – Euston service, which follows the new Up path on the Fast Line, needs to have one minute pathing time added to its schedule at Tring in order to maintain the headway behind the Up path. This results in arrival at Euston at xx:33 which is in line with the standard hour timetable produced at the high level optioneering stage.

Table 13 details the specific issues for each hourly path.

Table 13 Specific issues (xx30 arrival at Euston)

Path	Issues
0930	Same path as 4O88/4L89 between Madeley and Stafford – re-timing required
	4O14 crosses from US to DS approaching Nuneaton 1½ min before Up path is due to pass – re-timing required
1030	Up path requires same path as 6G51 between Hartford and Winsford – re-timing required
	4L97 joins SL at Crewe Basford Hall Jn 1½ min before Up path creating conflict immediately south of here – re-timing required
1130	Platform conflict at Preston with 1Q26 NR Measurement train – re-timing/re-platforming required
	Conflict with 4M34 on FL at Farington Jn – 4M34 needs moving to SL and re-timing to avoid 2F04
	Up path catches 6K32 (FO) at Acton Bridge
	Up path catches 4V20/6M69 at Hartford
	Up path catches 0A99 on SL at Madeley – re-timing required
	4O35 joins SL at Crewe Basford Hall Jn ½ min before Up path creating conflict immediately south of here – re-timing required
1230	Same path/within minimum headway of 6O60 between Lancaster and Wigan
	Same path/within minimum headway of 4M27 between Balshaw Lane and Crewe
	Same path/within minimum headway of 6F14 between Winwick and Warrington
	Same path/within minimum headway of 4M06 between Acton Grange Jn and Warrington
	Closes to within minimum headway behind 6M69 approaching Stafford
1330	This path may not be available on the FL at the standard timings between Stafford and Nuneaton due to 1A26 Manchester –Euston running 1 min later from Norton Bridge as a result of an off pattern LM service
	Same path/within minimum headway of 0K83 between Weaver Junction and Winsford
	4L75 scheduled to join SL at Crewe Basford Hall Jn ½ min after Up path – re-timing required
	Nuneaton to Rugby conflict due to Up train scheduled within 1 min of 0L41 (MO)
1430	Same path/within minimum headway of 4M26 (WO) between Balshaw Lane and Crewe. Using the TThFO timings for 4M26 resolves the issues apart from on approach to Crewe where the timings will need looking at
	Runs within minimum headway behind 0E33 (MO) Golborne Jn to Warrington

	0F61 (FO) departs Walton Old Jn at same time as Up path – re-timing necessary
	Madeley to Norton Bridge, SL is already occupied by 4M26 (MO) – issue resolved if 4M26 can use its WO or TThFO timings
	Path from Rugby to Euston is currently occupied by 1Q27 NR Measurement Train which will need re-timing
1530	Same path/within minimum headway of 4M28 (MO) between Balshaw Lane and Crewe
	Conflict at Wigan South Jn with 3S02 crossing over in opposite direction at same time as Up path
	Walton Old Jn to Hartford Jn same path/within minimum headway of 4M28 (MO) and 0F61 (TO)
	Same path/within minimum headway of 6G71 and 6V77 between Norton Bridge and Stafford
1630	Due to the 11:40 Glasgow Central – Euston running out of pattern south of Preston the standard path is not available in this hour on the SL between Crewe and Stafford (the LM service that is normally on the FL at this time in other hours runs on the SL in this hour). The result of this is that the path gets stuck behind a stopping service north of Crewe and thus the overall journey time is significantly extended
1730	Flexing of schedule of 6M11 required at Balshaw Lane due to junction margin being 1 minute short
	Same path/within minimum headway of 4M83 between Balshaw Lane and Weaver Jn
	Same path/within minimum headway of 4M64 between Weaver Jn and Winsford
	4L92 scheduled to join SL at Crewe Basford Hall Jn ½ min after Up path – small re-timing resolves conflict
	Within minimum headway/catches 4M44 between Crewe Basford Hall Jn and Stafford
	6B30 scheduled to join Up SL 1 min after Up path at Nuneaton

5.5 Findings – Extension to Blackpool

An inspection of the route showed that there is capacity to path these trains between Preston and Blackpool and that these paths can be extended from the xx33 departure / xx30 arrival at Euston. Turnrounds at Blackpool would be 45 minutes and there is capacity at Blackpool for these units. The issues that would need to be resolved are:

- Platforming at Preston – this would need to be amended from the December 2010 position, which may lead to small amounts of additional time inserted into other services around the Preston area.

- A path could not be found at the required time between Blackpool and Preston to extend the core Up path that arrives at Euston at 10:30 hours.

5.6 Findings – Extension to Blackburn

An inspection of the route showed that there is capacity to path these trains between Farington Junction and Blackburn in most hours. The issues that would need to be resolved for these services are:

- Platforming at Blackburn – these would need to be amended from the December 2010 position, which may lead to small amounts of additional time being inserted into other services in the Preston and Blackburn areas.

- The 06:23 departure from Blackburn (09:30 arrival into Euston) - all available platforms at Blackburn are occupied when this train should depart to meet its path on the WCML. An earlier departure may solve this, but it would depend on platform working and which direction the empty unit arrives from.

- The 12:59 departure from Blackburn (16:30 arrival at Euston) - due to the level of local services at Blackburn at this time of day, this schedule would be difficult to platform.

- The largest gap between the arrival and departure of the trials paths at Blackburn is only seven minutes. This is clearly too short to turnround a long-distance service and the units would therefore have to go somewhere for around an hour. It is recommended that the empty coaching stock (ECS) moves required to do this are examined in more detail to understand whether such a move can be accommodated.

5.7 Findings – Extension to Leeds

5.7.1 Down Direction

This aspiration was examined based on the standard xx.33 path from Euston and running from Crewe via Stockport, Guide Bridge and Huddersfield. The key findings with regard to this route are:

- An acceptable path was found as far as Huddersfield (arrive xx.20);

- There was a conflict with the xx.43 Selby – Wakefield Westgate (via Huddersfield) service at Bradley Junction. Re-timing either the Selby – Wakefield Westgate or the additional Euston – Leeds would impact on the following xx.29 Wakefield Westgate – Leeds (via Huddersfield) and, consequently, the xx.35 Manchester Airport –

Middlesbrough. The level of consequential re-timing associated with this aspiration in the timescales available is unachievable; therefore, further work would be required.

- The option of terminating the xx.33 from Euston at Huddersfield was considered. This train could only arrive on platform 8 (due to platform 4 being occupied by the xx.30 Huddersfield – Manchester Victoria) and would need to shunt clear of the platform in time for the xx.35 Manchester Airport – Middlesbrough to arrive at xx.26. Due to the presence of the Selby – Wakefield Westgate and Wakefield Westgate – Leeds trains, there would not be a sufficient margin to allow the empty train to be shunted.

- On this basis, it was concluded that the Down path was only feasible as far as Stalybridge (subject to platform availability at Stalybridge).

5.7.2 Up Direction

The key findings with regard to the Leeds extensions in the Up direction are:

- The aspiration for an Up path was examined as a “back-timing” exercise off the standard xx.30 arrival into Euston (pass Crewe xx/24½). This train would need to precede the xx.55 Manchester Piccadilly – London Euston to Crewe.

- There was insufficient margin at Alderley Edge between the arrival of the xx.38 Manchester Piccadilly – Alderley Edge (xx.08) and the passage of the Manchester – Euston train (xx.13½) to allow an additional train to pass between them, as the Rules of the Plan headway on this section is three minutes.

- The option of running the additional train in front of the Manchester – Alderley Edge train was also considered, but it was found that there was no suitable path, primarily because of the xx.00 London Euston – Manchester Piccadilly (via Stoke-On-Trent) train crossing the junction at Cheadle Hulme at xx.50½.

- Therefore, no suitable path in the Up direction could be identified.

Given the above, it is concluded that it is not possible to plan a path along this corridor matching the available slot on the WCML that does not have an impact on other services.

5.8 Findings – Extension to Bradford

This aspiration was also examined based on the standard paths, xx.33 departure from Euston and xx.30 arrival into Euston, leaving and joining the WCML at Winwick Junction and running via Manchester Victoria and Hebden Bridge.

- In the Down direction, suitable paths through to Bradford Interchange were identified in a number of hours (see detailed commentary below).

- In the Up direction, problems would be encountered between Bradford Interchange and Manchester Victoria. For the section between Bradford and Hebden Bridge, there is available capacity for an additional train to precede the xx.08 Leeds – Manchester Victoria service.

- Between Hebden Bridge and Manchester, the available capacity for an additional train is *following* the xx.08 Leeds – Manchester Victoria. With no facility for passenger trains to overtake on this section, no suitable path for the entire length of route was found. (The key limiting factor east of Hebden Bridge is the relatively long absolute block sections and the key limiting factor west of Hebden Bridge is the presence of the xx.05 Rochdale – Wigan Wallgate service, which calls at all stations between Rochdale and Manchester Victoria).

For this reason, it was decided to concentrate on developing paths to and from Hebden Bridge. A detailed commentary on each path is provided in Table 14.

Table 14 Hourly commentary on Hebden Bridge path

Train	Issues
07.33 Euston – Hebden Bridge	Slightly substandard headway with 6F38 06.50 Fiddlers Ferry – Liverpool Bulk Terminal between Winwick Junction and Earlestown.
08.33 Euston – Hebden Bridge	Conflicts with 4F60 10.33 Arpley Sidings – Liverpool Bulk Terminal between Winwick Junction and Earlestown.
09.33 Euston Hebden Bridge	3S90 (transit path for Merseyrail Anti-icing train) would need slight re-timing to avoid confliction at Earlestown.
10.33 Euston Hebden Bridge	Note comment below regarding 12.34 Hebden Bridge – Euston

11.33 Euston Hebden Bridge	
12.33 Euston Hebden Bridge	Conflicts with 5E88 Newton Heath – Manchester Victoria at Manchester Victoria.
13.33 Euston Hebden Bridge	
14.33 Euston Hebden Bridge	No path available, due to conflictions with 2J26 16.16 Liverpool Lime Street – Manchester Victoria and 2E89 15.56 Southport – Huddersfield
15.33 Euston Hebden Bridge	No path available – required path on Chat Moss route occupied by 2J30 17.10 Liverpool Lime Street – Manchester Victoria
06.03 Hebden Bridge – London Euston	Conflicts with 2M00 05.08 Leeds – Manchester Victoria, which makes additional calls in this hour
07.03 Hebden Bridge – London Euston	Conflicts with 2M04 06.03 Leeds – Manchester Victoria, which makes additional calls in this hour
08.03 Hebden Bridge – London Euston	Conflicts with 2M08 07.08 Leeds – Manchester Victoria, which makes additional calls in this hour
09.03 Hebden Bridge – London Euston	Conflicts with: 5J34 09.07 Stockport – Manchester Victoria at Manchester Victoria 6F14 08.50 Stanton Grove – Arpley Sidings between Earlestown and Winwick Junction
10.03 Hebden Bridge – London Euston	
11.03 Hebden Bridge – London Euston	
12.03 Hebden Bridge – London Euston	
12.34 Hebden Bridge – London Euston	Due to non standard times in this hour conflicts with new 10.33 Euston – Hebden Bridge path at Manchester Victoria
14.03 Hebden Bridge – London Euston	Conflicts with 6J91 13.29 Earles Sidings – Weaste at Manchester Victoria and again at Eccles

Additionally, shunting movements at Manchester Victoria are impacted on in some hours. Further work would be required to determine the feasibility of amending these movements.

It should also be noted that, if it were decided to operate these trains to/from Hebden Bridge, further work will be required on related ECS moves. Although it is possible to reverse a train at Hebden Bridge, for the paths detailed above, there would be insufficient time to reverse the train at Hebden Bridge without impacting on the following train. The ECS would therefore need to proceed to Greetland Junction, on the Brighouse line, to reverse. On returning to Hebden Bridge, the ECS would then need to be recessed in the Up Refuge Siding, to allow other traffic to pass, before forming the following departure to London Euston.

5.9 Findings – Extension to Glasgow

The extension of the missing hours services to Glasgow has found a number of conflicts between freight services and the extended passenger service, as well as some smaller conflicts in the Glasgow suburban area. It has not been possible to assess (in detail) solutions to all of the conflicts highlighted below. From a high level perspective, however, if the passenger services extended to Glasgow run at the times indicated, then this could require significant re-timing of freight services north of Carlisle in the relevant hours, which may exceed the flexing rights in the operators' track access contracts.

Table 15 Down Direction (xx30 departure from Euston)

Path	Issues
1030	1U66 Windermere – Manchester Airport is scheduled to depart Oxenholme (Platform 3) 1½ mins after Glasgow train passes (RotP requires junction margin of 2 mins)
	Glasgow train closes in to run 1 minute behind 3Z02 (MO) between Grayrigg and Tebay (3Z02 goes in loop at Tebay)
	Glasgow train runs less than minimum headway behind 4S78 between Penrith and Carlisle
	Conflict at Gretna Junction with 6E99 (MO) crossing from G&SW route across path of Glasgow train to join WCML in Up direction
	Conflict with 6S94 (WO) joining WCML in Down direction at Floriston 1½ min before Glasgow train passes
	Catches 4S40/4S41 between Lockerbie and Beattock
	Catches 4S18/4S31/4S32 between Beattock and Beattock Summit
	Catches 6S50 at Beattock Summit
	Catches 6S51 at Lanark Junction
	Due to pass 1 minute before 2C53 at Shieldmuir – can be resolved by running 2C53 1 minute later throughout
	Due to pass same time as 2S26 departs Motherwell – this can be resolved by flexing 2S26 later to Law Junction
1230	Catches 4S05 approaching Carlisle
	Junction margin issue at Caldew Jn with 6X12
	Catches 4S04 between Carlisle and Floriston
	Catches 3Q73 (MO) at Gretna Jn
	Catches 4S42 between Lockerbie and Beattock
	Catches 4S60/4S78 between Beattock and Beattock Summit
	Catches 6S09 between Abington and Carstairs
	Due to pass 1 minute before 2C61 at Shieldmuir – can be resolved by running 2C61 1 minute later throughout

	Runs in same path as 1Y89 between Uddingston and Glasgow Central. This would require 1Y89 to run 2½ mins later from Uddingston however this has knock on effects on 2F36 at Newton
1430	The FO timings for this service have been replicated Monday to Thursday and no conflicts with this path have been identified.

Table 16 Up Direction (xx40 departure from Glasgow Central)

Path	Issues
1540	Conflict with 2F23 at Rutherglen Central Junction
	Conflict with 1Y87 at Uddingston Jn – can be resolved by flexing 1Y87
	Catches 6M22 at Lockerbie
	Catches 4M74 between Lockerbie and Cove LC
	Platform occupation conflict with 6F04 at Carlisle
	Catches 6K73 between Penrith and Shap
	Catches 6K27 at Tebay
	Catches 6X12 between Carnforth and Lancaster

5.9.1 17:40 hours departure from Glasgow Central

The path of the existing 17:40 Glasgow to Birmingham service has been used as far as Lockerbie and hence is conflict free to this point. To fit into the existing timings of the 19:58 Preston to Euston (which is the train being back timed) the 17:40 path needs to arrive at Preston 10 minutes earlier than in its current form. This earlier arrival at Preston is achievable by omitting the stops at Lockerbie and Penrith that are in the schedule of the current 17:40 Glasgow – Birmingham path.

The only issue identified between Lockerbie and Preston is that the 17:40 closes to three minutes behind 6M46 at the point where this latter train turns off the WCML (minimum headway in this location is four minutes).

5.10 Findings – Additional Lockerbie / Motherwell stops

It has not been possible to undertake any detailed work examining additional Lockerbie and Motherwell stops. A high level view is that inserting additional stops at Lockerbie may be feasible, however the provision of additional stops at Motherwell, if this is possible, is likely to be challenging. It is recommended that further work be done on this aspiration if it is to be taken forward.

5.11 Prototype Timetable

A copy of the prototype timetable has been provided to ORR in CIF format with detailed timings of each path in an excel spreadsheet.

6. Performance Impact (XX:33 Path)

6.1 Performance assessment of the Down Direction

The impact of an additional service in the Down direction can be investigated by looking at the peak usage of the xx:33 path.

The 16:33 Euston to Preston service operates in the May 2010 timetable so has been used to investigate its impact in terms of performance. The 16:33 has been found to cause reactionary delay to approximately two to three other trains per week with an average reactionary delay of 13 minutes per week. This is not exceptional on the WCML for long distance services.

The behaviour of the flight of trains immediately after the current 16:33 departure compared to the same flight of trains in the previous hour (i.e where there is no xx:33) departure has been examined (see Fig 1). Based on current year data, the flight of trains following the 16:33 departure actually have a better PPM record.

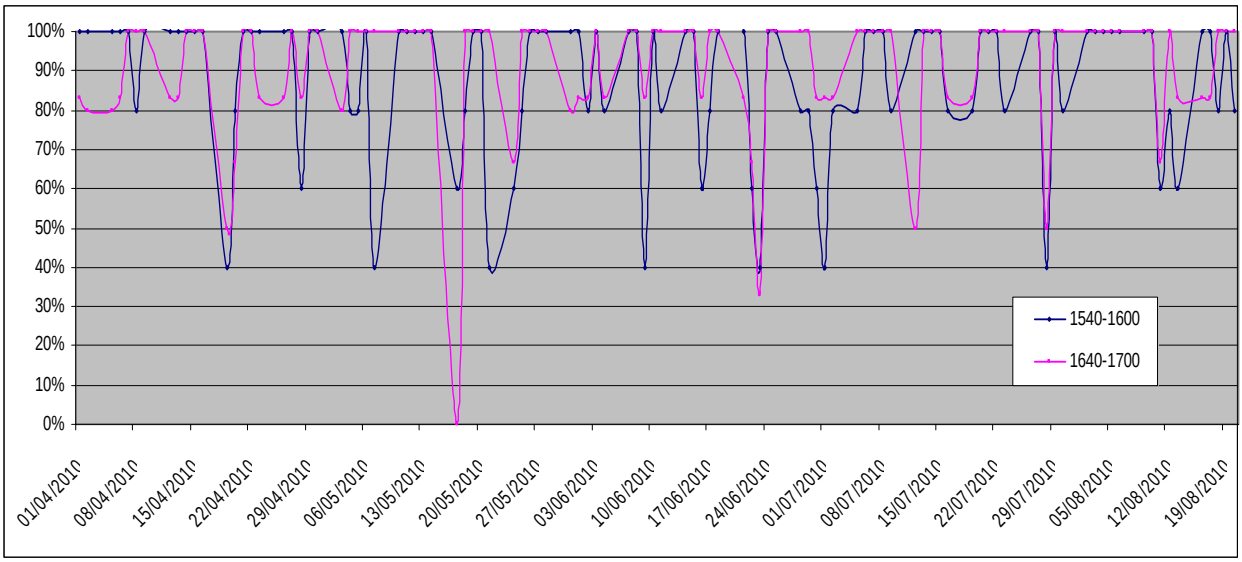

Figure 1 Comparison of PPM for two time periods to examine the impact of the 16:33 service (01/04/2010 to 10/08/2010)

The analysis of the Down direction has shown that there would be no objection to the path on performance terms.

6.2 Performance assessment of the Up Direction

The Up direction service represents a potentially significant performance risk. In particular reactionary delays are caused due to a number of minimum headways and junction margins (which exist in the proposed path), as detailed below:-

- Path passes Euxton Junction on Fast Line three minutes (minimum margin) before TPE Manchester-Scotland service crosses from Chorley line to join Down Fast Line.
- Path crosses Up Fast Line to Slow Line immediately south of Crewe station.
- Path crosses Slow Line to Fast Line at Stafford No.5.
- Path runs on Fast Line three minutes behind Manchester-Euston and three minutes in front of Glasgow-Euston between Stafford and Nuneaton.
- Path crosses Fast Line to Slow Line on northern approach to Nuneaton station in order to make station call without obstructing following Glasgow-Euston train (note: ex Glasgow train would need to run two minutes later Nuneaton to Euston in order to allow for the deceleration of the new path to change lines).
- Path crosses Slow Line to Fast Line immediately south of Rugby station.
- Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx service joins Fast Line at Ledburn Junction three minutes in front of new path. The new path then follows the Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx path at three minute headways, all the way to Euston (pathing time has been added into new path to account for the better performance of a 221T compared with the Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx Class 350).
- Wolverhampton-Euston service runs three minutes behind new path from Ledburn Junction to Watford Junction (where the Wolverhampton train calls).
- From Watford Junction to Euston the Wolverhampton path referred to above is then followed three minutes later by the Chester-Euston, which in turn has the Manchester-Euston three minutes behind it – therefore any delay from the Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx service back could potentially have some degree of impact on some/all of these services.

6.2.1 Stafford to Nuneaton

The proposed path crosses from the Slow Line to the Fast Line at Stafford and is pathed between the Manchester to Euston service and the Glasgow to Euston service on minimum headway. To examine the potential increase in reactionary delay that utilising this white space could have on performance, the lateness of Manchester service has been examined. This will

show how often the white space between the two long distance paths is used through lateness to the Manchester service.

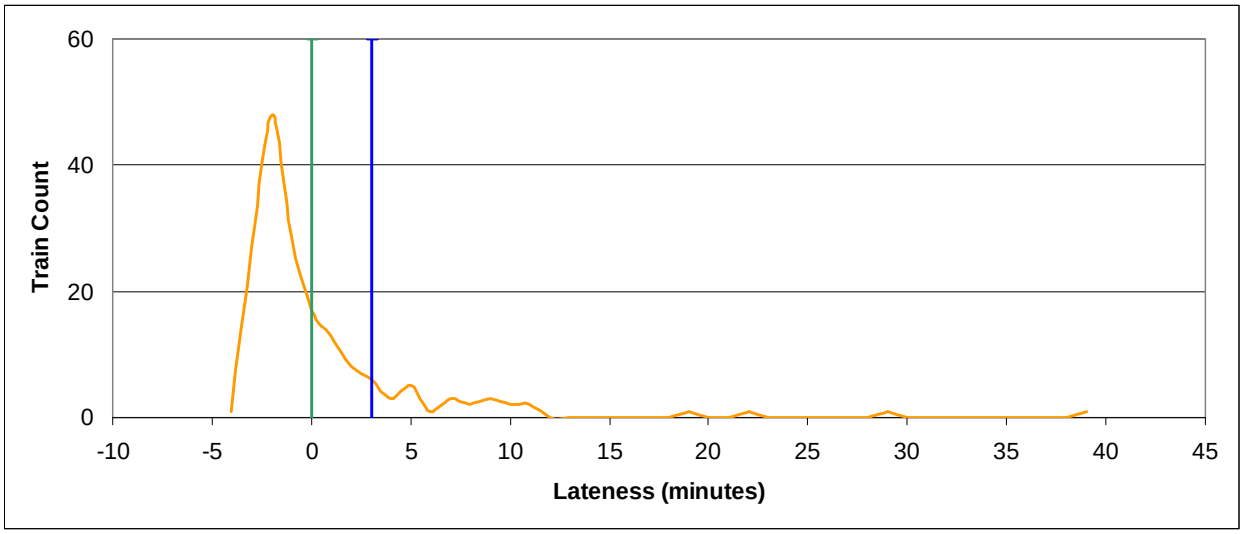

Figure 2 Lateness for Manchester – Euston Service at Stafford (2009/10 Period 6 to 2010/11 Period 5)

Both Figure 2 and Figure 3 show that over the previous 13 periods there were occasions when the Manchester – Euston service was running between 0 and three minutes late and therefore utilising the white space that would be removed with the provision of an additional 125mph path.

Green Line – indicates the point where lateness would cause reactionary delay to the following services in the proposed timetable with an extra 125mph path in the Up direction.

Blue Line – indicates the point where lateness would cause reactionary delay to the following service in the December 2010 timetable.

The similarity in the graphs suggests that added reactionary delay between Stafford and Nuneaton will be negligible – the biggest factor would be the lateness of the Manchester service at Stafford. At this location the timetable with the additional 125mph path would be more susceptible to reactionary delay where it needs to join the Fast Line at Stafford.

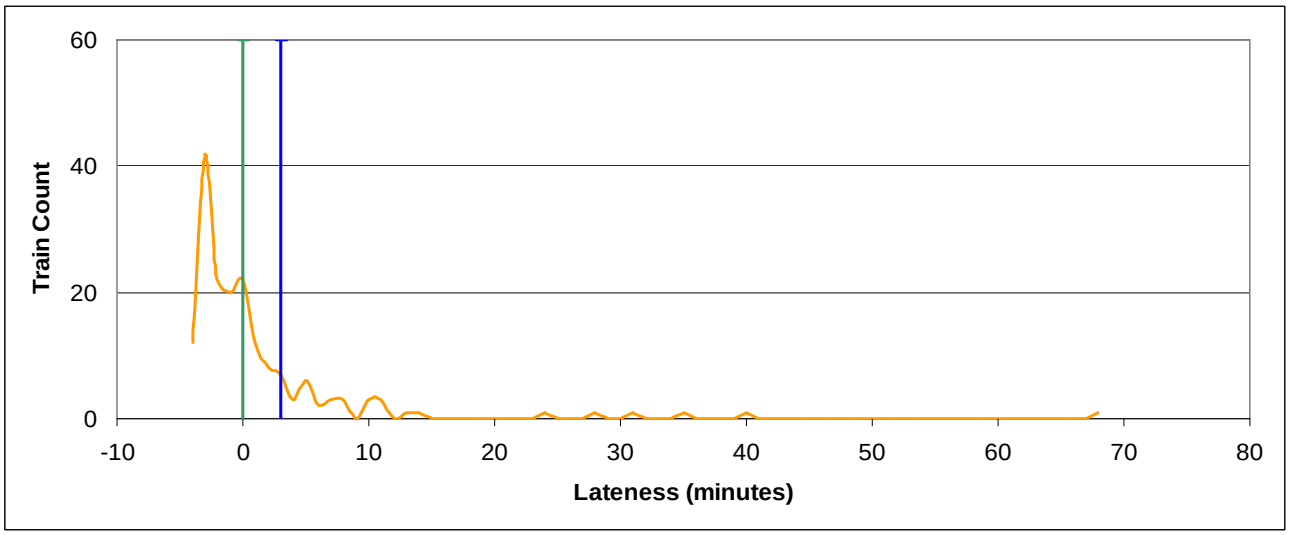

Figure 3 Lateness for Manchester – Euston Service at Nuneaton (2009/10 Period 6 to 2010/11 Period 5)

6.2.2 Ledburn Junction to Euston

The proposed 125mph path is added to the timetable structure by using the spare capacity between the 100mph Fast Line service from Northampton and the 125mph Fast Line service from Wolverhampton. In the current timetable this white space can be used for recovery before the next flight of long distance services arrives in London. The lateness of the 100mph path has been extracted so that the number of times its lateness results in it utilising the white space can be seen. This will provide an indication of the impact of removing this white space from the timetable. Lateness has been examined over the last 13 periods at Ledburn Junction, Watford Junction and Euston on weekdays only in the off-peak.

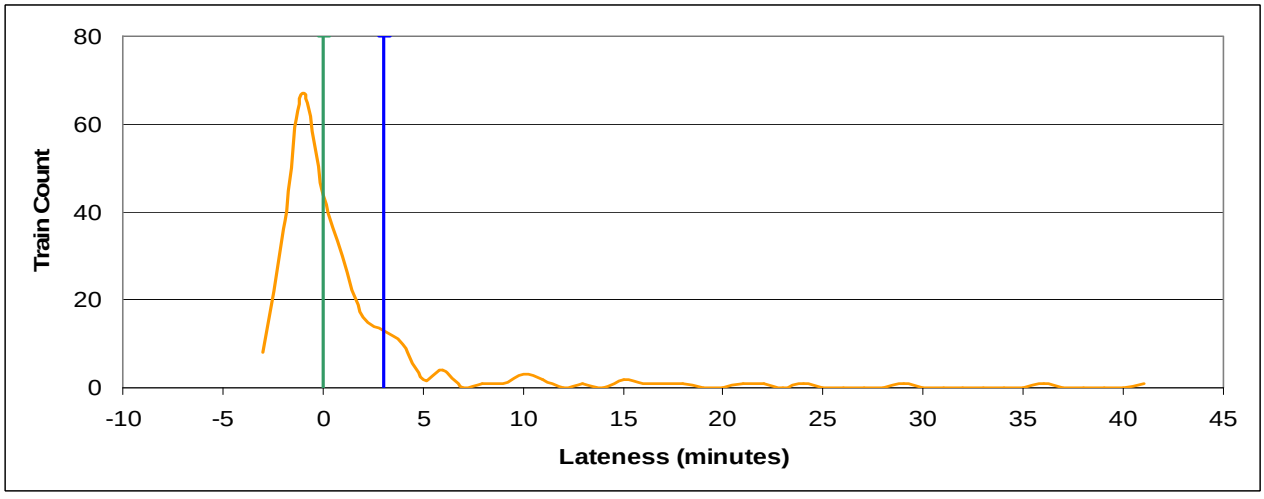

Figure 4 Lateness for Northampton – Euston Service at Ledburn Junction (2009/10 Period 6 to 2010/11 Period 5)

Green Line – indicates the point where lateness would cause reactionary delay to the following services in the proposed timetable with an extra 125mph path in the Up direction.

Blue Line – indicates the point where lateness would cause reactionary delay to the following service in the December 2010 timetable.

The performance of the 100mph path is predominantly good with many services presenting early at Ledburn Junction. There are 60 instances (out of 249) of between 0 and three minutes lateness which would impact on the proposed 125mph path that would not have affected the following service in the current timetable structure. There could be two potential impacts to this in the proposed timetable.

The 100mph path could be pathed onto the Fast Line when it is between 0 and three minutes late and causes reactionary delay to the following flight of four trains; or, the 100mph could be regulated at Ledburn Junction when running between 0 and three minutes late and continue to be routed on the Slow Line. The latter would result in the 100mph path gaining further lateness by being pathed behind a slower stopping service.

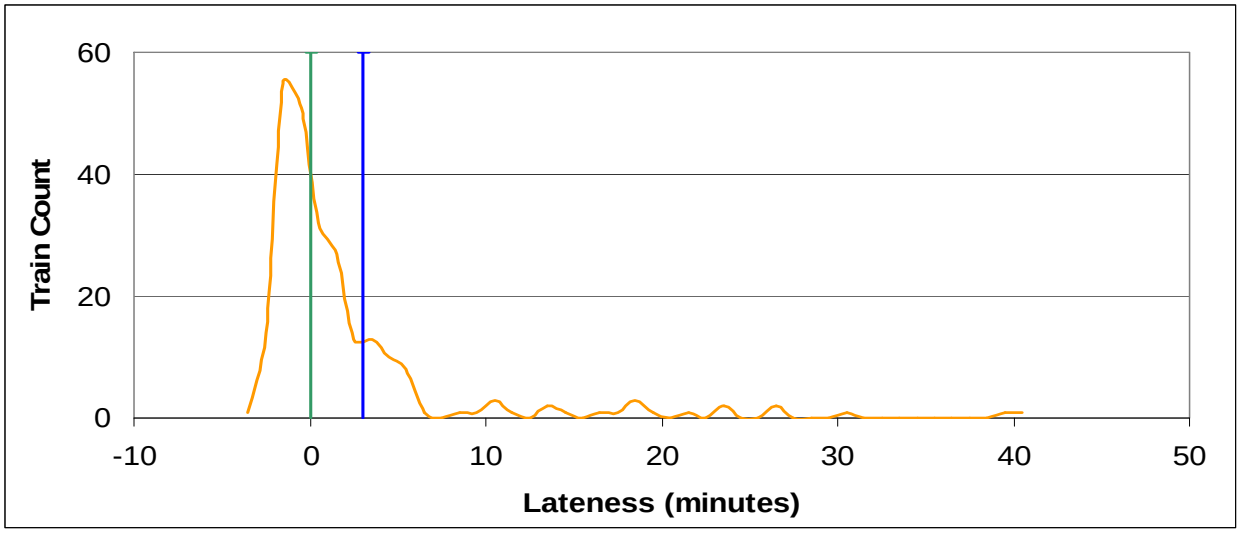

Figure 5 Lateness for Northampton – Euston Service at Watford Junction (2009/10 Period 6 to 2010/11 Period 5)

Green Line – indicates the point where lateness would cause reactionary delay to the following services in the proposed timetable with an extra 125mph path in the Up direction.

Blue Line – indicates the point where lateness would cause reactionary delay to the following service in the December 2010 timetable.

There are 72 instances (out of 249) of between 0 and three minutes lateness which would impact on the proposed 125mph path that would not have affected the following service in the current timetable structure.

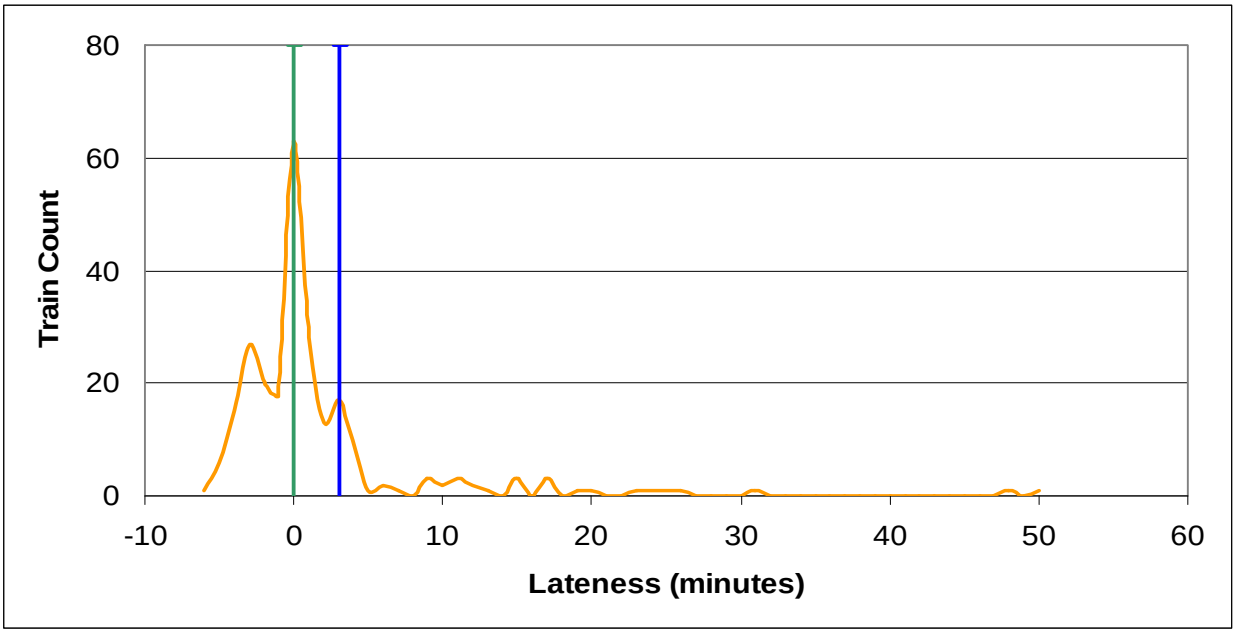

Figure 6 Lateness for Northampton – Euston Service at Euston (2009/10 Period 6 to 2010/11 Period 5)

Green Line – indicates the point where lateness would cause reactionary delay to the following services in the proposed timetable with an extra 125mph path in the Up direction.

Blue Line – indicates the point where lateness would cause reactionary delay to the following service in the December 2011 timetable.

There are 58 instances (out of 249) of between 0 and three minutes lateness which would impact on the proposed 125mph path that would not have affected the following service in the current timetable structure.

6.2.3 Conclusions for Up Direction

This further analysis assessed the potential impact of the minimum margins used for the Up path. This supports the view that the Up path does present a real performance risk, with approximately 25 percent of the new Up services likely to experience some reactionary delay. The recommendation would be for further timetable work to be carried out to try to reduce this risk. However, the estimated impact - whilst tangible - does not appear to be sufficient enough to raise an objection to the path on performance grounds alone.

7. Maintenance

7.1 Network Availability

The appropriate Maintenance Depots have confirmed that any off-peak timetabled changes proposed as part of this process would have negligible impact on maintenance activity. However, any services operated later in the evening, or very early in the morning may infringe on current agreed Rules of the Route times.

The times that maintenance have access to the network must not be reduced as a result, as this will cause significant difficulty in maintaining the infrastructure.

7.2 Power Supply

A high level power supply study was undertaken as part of the WCML power supply upgrade project. The project demonstrated that it is likely the power supply could facilitate the increment in electric services as examined as part of this study. However, in order to be fully satisfied that the power supply can accommodate the additions as outlined in this report, it would be necessary to test the assumptions around a 30 minute interval throughout the day to reflect a full timetable.

8. Operations and Safety

8.1 Safety Assessment

There are no particular safety issues raised with this proposal, however, Network Rail's key safety concern is associated with the use of level crossings on the network.

In comparison with the East Coast Main Line (ECML), the WCML has benefitted from the removal of several level crossings by the West Coast Route Modernisation project; for example, Hest Bank level crossing, which is north of Lancaster, is the first level crossing north of London Euston.

It should be noted that any increment in service provision is carefully monitored and captured through the Track Access application process. Although this proposal does not drive any major safety concerns, it should be noted that any major increase in service frequency in the busiest hour would necessitate the undertaking of individual level crossing risk assessments.

It is also worth mentioning that in the event of perturbation, Network Rail's operational safety risk increases when train paths are maximised, e.g. more trains affected by an incident and more disruption occurs (i.e. more red signals, more cautionary aspects, more defensive / professional driving, more telephone calls and more multi-tasking by signallers and drivers etc). This concern is also raised in the following section by Network Rail's operations staff.

8.2 Operations / Rolling Stock

On the WCML Fast Lines, it would be advantageous if the rolling stock utilised was capable of 125mph Enhanced Permissible Speed (EPS) running, thereby making the maximum use of the capacity available. Any rolling stock used which is not capable of running in 'tilt' mode, will be restricted to a reduced maximum speed of 110mph only.

For operational reasons it would be better to make the maximum use of the overhead line electrification (OLE) already in place on the route and utilise electric traction rolling stock wherever possible, thereby reducing the need for diesel multiple units running under the OLE. This is particularly true for the current Birmingham to Scotland diesel services (currently operated by Class 221 Voyager units) running under the OLE. Electric train operation does generally allow a better acceleration / deceleration capability. Given the intensity of 125mph trains – nine per hour minimum, the long distance operation of a permissible speed operated train can be challenging.

If more of the WCML Slow Lines were capable of a linespeed of 100mph or more, then services could be taken off the Fast Lines and transferred to the Slow Lines (e.g. Class 350 units) thereby possibly releasing further valuable capacity on the Fast Lines for other services.

Careful consideration needs to be given to the reduction in any rolling stock turnrounds or layovers. Likewise, additional empty coaching stock moves to/from location/depots needs to be assessed.

Any increase in train paths will have an effect on disruption during recovery from perturbation. Train delay minutes / performance figure effects from additional paths may be increasingly higher than that one path. Any increase in paths does not directly cause a similar increase in delay minutes. Furthermore, there needs to be an early agreement on pathing priority during disruption if a new operator is permitted to use this path. The contingency plans clearly need to be agreed to show, **in advance**, what services will operate under reduced capacity and pathing, in line with the Network Code.

9. Stakeholder Engagement

9.1 1-1 Stakeholder Meetings

As a key part of the process, Network Rail set out to arrange 1:1 meetings with individual stakeholders as required to discuss their aspirations in more detail, clarifying any matters as necessary to inform Network Rail's view of how proposals might be accommodated.

A suite of meetings were arranged during August and September 2010 (as appropriate) and 1-1s were held with as many stakeholders as possible. Copies of all meeting notes have been sent to ORR separately (for confidentiality purposes). ORR has been kept fully up-to-date with progress. However, due to diary constraints and the tight timescales, it has not been possible to see all stakeholders.

Appendix B shows the details of the meetings held along with the dates.

9.2 Progress Report Meetings

Regular reports and updates were given to the ORR on a weekly basis throughout the programme. In the early stages, weekly face-to-face meetings were held in London. As the process became more established it was agreed that it would be more appropriate to hold regular telephone conferences.

9.3 Further Work

As an outcome of some stakeholder 1-1 meetings, Network Rail was requested to carry out further high level timetabling assessments (see Appendix D). It was agreed to work with the aspirants to assess the feasibility of their proposals in greater detail. This was undertaken outside the core WCML capacity study workstream, but in parallel to it for consistency purposes.

A high level assessment of the feasibility of the following aspirations was undertaken:

- 4tpd LDHS timed at 110mph between London Euston and Blackpool North (plus 1tpd London Euston to Hartford);
- an additional 1tph non-London regional between Coventry and Northampton (an extension of an existing 1tph non-London regional service between Birmingham New Street and Coventry);
- diversion of 1tph non-London regional Birmingham New Street to Liverpool Lime Street to Preston; and

- an additional 1tph non-London regional between Crewe and Liverpool Lime Street (an extension of existing 1tph non-London regional between London Euston and Crewe) to replace the above.

9.3.1 LDHS London Euston to Blackpool North

This aspiration involves operating four trains per day each way between London Euston and Blackpool North, calling at Nuneaton, Tamworth Low Level, Hartford, Preston, Kirkham and Wesham and Poulton-le-Fylde. This aspiration also includes one additional service each way between London Euston and Hartford, calling at Nuneaton, Tamworth Low Level and Lichfield Trent Valley.

These services would be operated by 110mph capable rolling stock, as a precursor to introducing 125mph EPS rolling stock with improved paths at a later date.

It was found that the aspiration could operate south of Preston, with some minor flexing to existing services and subject to the following amendments;

- a maximum of one call can be made at either Nuneaton or Tamworth, but not both;
- platforming at Euston needs to be validated, particularly for the aspired Up morning peak services, which would take the Fast Lines into Euston above their maximum planning capacity.

The aspired paths are not achievable within the current timetable structure between Preston and Blackpool North. Accommodating these paths would be at the expense of journey time to existing services. A more fundamental re-structure of the timetable would be needed to adequately accommodate the desired paths.

9.3.2 Non-London regional aspirations

The further analysis undertaken for these aspirations is detailed in Appendix D.

9.4 Other Franchise Renewals

It is worth noting that the other franchise renewals are due in the next few years which may affect train services on the WCML route (e.g. TPE in January 2012, Northern Rail in September 2013, and London Midland in September 2015).

10. Links to Other Projects

10.1 Stafford area improvement project

Enhancements being delivered as part of the Stafford Area Improvement Project include grade separation of Norton Bridge Junction, a new freight loop at Stafford, and speed enhancements at Trent Valley and Doxey junctions and the Slow Lines between Doxey and Norton Bridge. The enhancements in the Stafford station area must be delivered in conjunction with Stafford area re-signalling.

The project has been developed using a train service specification from the DfT, which Network Rail has developed into a timetable. DfT has agreed this timetable and confirms that it meets the required specification outputs. However, it must be noted that this specification is over and above the ORR specification and represents a re-cast of WCML services. It, therefore, does not include an xx:33 Euston to the North West path.

This new timetable optimises the use of capacity at the south end of the route into and out of Euston. As such, it is viewed as the final capacity iteration before a new line or further route upgrade is required. Specifically, the Stafford Area Improvement Project is remitted to provide three additional passenger paths per hour (two from London and one on the Manchester-Birmingham axis) and one additional freight path (via Trent Valley route). The project is due to be completed by December 2017, and relies on the Power Supply Upgrade having been successfully completed in the Stafford area, prior to running the new train service proposed.

10.2 Bletchley re-signalling

This project delivers specific capacity enhancements that contribute to the delivery of DfT's HLOS programme. The primary objectives of the project are:

- Renewal of life expired signalling and track assets
- Transfer of signalling control from Bletchley to Rugby Signalling Control Centre
- Provision of 12-car capability on platforms 4 and 5
- Provision of a bi-directional freight loop to accommodate 775m train length
- A new, higher speed Bletchley South Junction at Drayton Road
- Capability for extending Bedford-Bletchley services to Milton Keynes Central.

This project is due to be completed by June 2013.

10.3 North West Electrification

The proposal for electrification of the North West area will have an effect on the power supply requirements and feeder arrangements for the WCML route and what is needed. In particular the power supply system design specification for the North West electrification scheme (i.e. 'Classic' electrification or auto transformer electrification) will affect the power supply upgrade requirements and timescales for works in the North West area on the WCML route. New diversionary opportunities will arise when new electrified routes becoming available.

10.4 Northampton Re-Control

As part of the re-control of the signalling equipment in the Northampton area, feasibility work is being undertaken to assess if the linespeed between Northampton and Rugby can be increased from the current 75mph up to a possible 85mph. The scheme is planned to be implemented in May 2012.

10.5 Watford Area Signalling Renewals

As part of the Watford area signalling renewals, feasibility work is being undertaken to assess if linespeeds can be increased. A significant amount of switches and crossings are being renewed and this may create opportunities for enhancements. The scheme is planned to be implemented in late 2013.

10.6 2030 Freight Forecasts

There are concerns with how freight services are powered. It has been assumed that, in general, existing freight services will continue to be operated by diesel locomotives.

If existing freight services transfer to electric traction and new freight services materialise (powered by electric traction), then the existing power supply might not be able to cope with this additional demand. It should be noted that it is very difficult to undertake any modelling exercises without detailed timetables and timings being available, along with origin and destinations of traffic. This information is not available for freight traffic.

10.7 West Coast Route Utilisation Strategy

The West Coast Route Utilisation Strategy (RUS) is the last RUS to be published by Network Rail in the first generation programme. It is currently in the Gaps and Options stage and is reviewing possible interventions that have been proposed to address gaps.

The West Coast RUS work initially commenced two years ago (September 2008) and has therefore been developed as a separate workstream. The Draft for Consultation document is due to be published in December 2010 with a final document planned for the summer of 2011.

It is possible that alternative options are proposed in the RUS consultation document. This is not seen as an obstacle to this process, and could be considered as beneficial for the rail industry as it may offer further choices for Government as to what it may want to ‘buy’.

The Stakeholder Management Group, which gives industry guidance for the West Coast RUS, has met on a regular basis throughout the process, with regular representation from both the DfT and ORR, so that the direction of the West Coast RUS is fully understood and agreed.

11. Conclusions

The prototype timetable demonstrates that in some hours there is additional ‘white space’ capacity in both directions between London Euston and Preston. However, each path does have remaining timetabling conflicts primarily in the direction towards London Euston.

From a timetable analysis perspective, across the core route for 24 hours, a total of 35 conflicts have been highlighted. Of these conflicts, seven have been resolved, 12 cannot be resolved without altering other operators’ track access rights and 16 conflicts need further in-depth timetabling work to understand whether or not the conflict can be resolved. These numbers do not take into account the possible extensions at the northern end of the route.

In the north-bound direction (Down) the XX:33 departure experiences less complications compared with the Up direction. This is primarily a result of the 24 hour standard timetable pattern whereby the path is currently occupied in the hour of 16:33.

Network Rail recognises that by introducing additional services, network performance becomes more at risk. The London North Western performance team have identified that the flighting of services (based on the current performance level of the 16:33) generally improves performance in this hour. However, by utilising every XX:33 departure in every hour from London Euston it will increase reactionary delays and reduce headroom currently enjoyed for network recovery.

Performance analysis demonstrates that in the Up direction the impact on performance is more significant, especially the reactionary delay created due to the tight flighting of services. Network Rail would expect these issues, along with the resolution of timetabling conflicts, to be resolved as part of the Track Access application process.

Adequacy of power supply remains a known risk at this stage, although the high-level power supply study undertaken as part of the WCML power supply project demonstrated a marginal headway in the accommodation of additional electric services. It is recommended that the study is updated to test the service assumptions that are proposed.

From a wider perspective, analysing the train service extension to various destinations off the WCML route has proved very difficult, and affects timetabling elsewhere. The work highlights that rolling stock turnrounds are already tight and can be difficult to recover. There also needs to be an early agreement on pathing priority during disruption if a new operator is permitted to

use this extra path. The contingency plans clearly need to be agreed and show, in advance, what services will operate under reduced capacity and pathing.

12. Abbreviations and terms

DfT	Department of Transport
DIRFT	Daventry International Rail Freight Terminal
ECS	Empty Coaching Stock
EPS	Enhanced Permissible Speed
FL	Fast lines
GRIP	Guide to Railway Investment Projects
HLOS	High Level Output Specification
HSMT	High Speed Measurement Train
LDHS	Long distance high speed
MO	Monday only
OLE	Overhead Line Electrification
ORR	Office of Rail Regulation
RUS	Route Utilisation Strategy
SFN	Strategic Freight Network
SCC	Signalling Control Centre
SL	Slow lines
S&C	Switch & Crossings – Sections of rail used to control movements of rolling stock between different lines on the railway.
SRT	Sectional Running Times
SX	Saturday's Excepted
TO	Tuesday only
TPD	Trains per day
TPH	Trains per hour
TThFO	Tuesday's, Thursday's & Friday's only
TWO	Tuesday's & Wednesday's only
TV	Trent Valley
WCML	West Coast Main Line
WO	Wednesday's only

Appendix A

Prototype Timetable Development Remit - West Coast Main Line – Phase Two

Summary

As part of the initial West Coast Trains re-franchising process, in May 2010, the Office of Rail Regulation (ORR) wrote to industry Stakeholders seeking to identify any future new and/or amendments to track access rights on West Coast Main Line (WCML) post April 2012. In response, the ORR received a number of expressions of interest (aspirations).

In order to inform its decision regarding any access rights ORR instructed Network Rail to conduct a two phased approach that assessed current network capacity and determined the optimal utilisation of remaining network availability along the WCML corridor[1]. Phase one concluded that there were three potential scenarios, all with differing criteria, outputs and changes in existing operations; these were:

Scenario One: 1 x 125mph 'off peak' train path per hour between London Euston and Preston
Scenario Two: 2 x 125mph 'off peak' train path per hour between London Euston and Preston
Scenario Three: 1 x 110mph 'off peak' train path per hour between London Euston and Preston

On reviewing the three scenarios above, the ORR has concluded that for the purpose of this exercise, Scenario One appears to offer the best whole industry solution. ORR was concerned that Scenario Two would effectively fill the off-peak timetable which was considered to be unsustainable from a performance point of view. Similarly, Scenario Three would have significant impacts upon the operation of services, including journey times and calling patterns, leading to the creation of a non-mirror image timetable.

The ORR therefore instructed Network Rail to undertake the development of a prototype West Coast Main Line timetable for Scenario 1. The expected output shall be the establishment of the criteria for one additional timetable path per hour for Scenario One to the specified outlined in section 1.

Section 1 - Timetable Specification

Using the December 2010 timetable as the base (including changes proposed under Eureka East Coast Timetabling project) construct a prototype timetable to the following specification:

- One SX 'off peak' hourly departure from Euston at xx:33 (with equivalent return workings) to as far as Preston;
- Timed as Timing Load 221T.
- Operational hours from Euston between and including 07:33 to 15:33. Return workings to arrive in London approxaimately hourly commencing after the height of the morning peak.
- Calling Pattern as follows - Milton Keynes Central, Rugby, Nuneaton, Crewe *(Crewe calls may be omitted if appropriate).*
- Off route options should also be considered during development:
    - *Extension to Lancaster, calling at Warrington Bank Quay, Wigan North Western and Preston.*
    - *Extension from Preston to Blackpool.*
    - *Extension from Newton Le Willows to Bradford Interchange via Manchester Victoria (onward calling pattern to be confirmed through 1:1 stakeholder meeting).*
    - *Extension from Crewe to Leeds via Heaton Norris (onward calling pattern to be confirmed through 1:1 stakeholder meeting).*
    - *Extension from Wigan North Western to Blackburn.*
    - *The existing 1333 FO departure to Lancaster should be amended to match the above pattern, along with equivalent southbound services.*
- Extensions of xx:30 Euston – Lancaster services to and from Glasgow, and equivalent Lancaster – Euston services to strat from Glasgow, excluding the potential 1940 ex-Glasgow Central.
    - *Existing calling pattern to be retained (Warrington Bank Quay, Wigan North Western, Preston, Lancaster, Oxenholme Lake District or Penrith, Carlisle).*

[1] See ORR's website at http://www.rail-reg.gov.uk/server/show/nav.2437 for further information.

Doc # 390174.01

- Consideration should be given to unit balancing
- 4tph on DC lines.
  - *Assuming suitable re-cast of Bakerloo Line timetable.*

- A commentary is to be given on the feasibility of including additional Lockerbie and/or Motherwell calls on West Coast Main Line (London, Birmingham or Manchester) services in the timetable.

Freight Services

- Existing Freight services to be retained and, if necessary, retimed within current agreed track access rights.
- Additional increase in freight services in line with Strategic Freight Network growth forecasts for 2019.

Section 3 - Specification Post-North West Electrification

It should be noted that, in all this, there may be a completely different timetable in the north-west, given that electrification is likely to produce different point-to-point times, and that different origin and destination pairs, routings and stopping patterns are likely to result. On that basis, ORR believes that it would be better to put off this element of the work until such time as a basis exists to review the whole timetable north of Crewe.

Section 4 - Not being taken forward

The following are not specifically to be developed further in the prototype timetable:

- Any aspirations that require uncommitted infrastructure enhancements;
- 110mph paths on the Fast Lines between Euston and Crewe for the reasons given above;
- Additional 125mph Fast Line paths to/from Euston beyond that described above;
  - i.e. only one additional path per hour to be included in the off-peak only.
- Any additional Slow Line paths between Euston, Northampton and Rugby other than those required to meet freight growth forecasts because of the trade offs required, particularly the significant impact on freight services;
- Any removal of Fast Line calls at Watford Junction because of the detrimental effect on what is already considered to be a poorly served station;
- Any prioritisation of a reduction in journey times for CrossCountry services compared to December 2010;
- Any increase to the frequency of services between South Croydon, East Croydon, Clapham Junction, Shepherd's Bush, Watford Junction, Tring and Milton Keynes Central compared to December 2010 because of occupation of the SLs and potential impact on freight;
- Any additional Manchester – Scotland services compared to December 2010 again because there is no specification for what these might be and because of the potential impact upon freight.

Section 5 - Definitions

Off Peak - Between the hours of 07:33 and 15:33 Mondays to Fridays
SX - Mondays to Friday operation
Aspirant - Stakeholder that has expressed an interest, in response to the ORR letter dated 14th May 2010, to propose a new or amendment(s) to future track access rights along or impact or the WCML.

Appendix B

Stakeholder meetings held:

Date	Location	Stakeholder
N/A		

Appendix D

N/A