West Coast Main Line Capacity: December 2013

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Report Control Sheet

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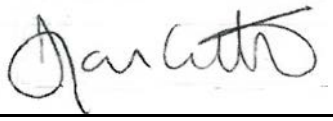
Approved by 	**Name:**	**Dyan Crowther**
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Issue Record

Issue Number	Amendment	Date
1	1st Draft	16/11/12
2	Includes various changes	18/11/12
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1. Abbreviations & Terms

DMU	Diesel Multiple Unit
DfT	Department for Transport
DPI	Delay Per Incident
EMU	Electric Multiple Unit
EPS	Enhanced Permissible Speed
ESG	Event Steering Group
FL	Fast Line
FTPE	First TransPennine Express
GRIP	Guide to Railway Investment Projects
HS1	High Speed 1
HS2	High Speed 2
HLOS	High Level Output Specification
ICWC	InterCity West Coast
JPIP	Joint Performance Improvement Plan
LDHS	Long Distance High Speed
LM	London Midland
MO	Mondays Only
NMT	New Measurement Train
OLE	Overhead Line Electrification
ORR	Office of Rail Regulation
PSUP	Power Supply Upgrade
SCC	Signalling Control Centre
SL	Slow Line
S&C	Switches & Crossings
SRT	Sectional Running Time
SX	Saturdays Excepted
TO	Tuesdays Only
TPD	Trains Per Day
TPH	Trains Per Hour
TThFO	Tuesdays, Thursdays & Fridays Only
TWO	Tuesdays & Wednesdays Only
WCML	West Coast Main Line
WO	Wednesdays Only

2. Executive Summary

2.1 The ORR is currently considering a number of applications for new or revised access rights over the West Coast Main Line (WCML). The ORR asked Network Rail to review three aspirants' proposals and assess whether they could be accommodated within existing capacity on the route. Our analysis looked at proposals from Alliance Rail, First TransPennine Express (FTPE) and the InterCity West Coast operator (ICWC), and concluded that there were timetabling conflicts with each of the aspirants' proposals.

2.2 Our analysis has only included the additional services which the ORR asked Network Rail to consider. The work completed here has not included any aspirations that other timetable participants might have for timetable changes on the WCML

2.3 Our analysis of the proposed xx.33 (and return) paths has identified a number of significant timetabling conflicts with the hourly Alliance/ICWC proposition as evidenced by our analysis in sections 6.3.1 and 6.3.3 and Appendix 1. The analysis shows that the majority of the direct conflicts could be resolved. In our professional opinion however, resolution of other consequential conflicts, particularly in the Birmingham, Glasgow, Liverpool and Manchester areas will require significant timetable work. Our judgement is that this should form an input to the Event Steering Group (ESG) for the WCML.

2.4 The xx.36 path (and return) could be accommodated by being overtaken at a number of locations. We cannot accommodate these trains in the current timetable without adopting this approach. It should be noted that as well as being overtaken, these services also make more calls than other comparable services on the route and as a result have a journey time between London Euston and Preston of 2 hours 27 minutes in the down direction (against a normal journey time of around 2 hours 8 minutes), and in the up direction 2 hours 45 minutes (against a normal journey time of around 2 hours 10 minutes). The criticality of these timetabled overtaking moves at Milton Keynes in the Down direction and Rugby and Milton Keynes in the Up direction is such that any delay to these services will have a knock-on impact on following trains, thereby reducing the robustness of the timetable.

2.5 Without further detailed timetable analysis, we are unable to confirm whether Northern's contracted quantum between Liverpool and Blackpool North could be accommodated in the current timetable.

2.6 The ability to accommodate services without impacting on the Access Rights of another operator, does not in itself equate to a conclusion that any or all of the proposed services could be accommodated without significant change to the timetable in locations including (but not limited to) Birmingham, Glasgow, Liverpool and Manchester.

2.7 The additional services which FTPE are planning to operate between Manchester Airport and Scotland have been developed jointly with the industry through the ESG for the WCML. This project has successfully resolved the majority of timetabling conflicts and, subject to remaining issues being addressed, Network Rail would be comfortable in selling the rights needed to operate these additional services. See section 6.7.

2.8 There are a number of significant projects currently underway, which are covered in Section 10. The timetable benefits of these projects are intended to be captured via the cross- industry West Coast ESG, which will commence early in 2013 and develop proposals covering the future structure of the WCML timetable for the period from 2016 onwards.

2.9 Performance on the WCML continues to fall below the Regulatory Targets set for CP4. The ORR wrote to Network Rail on 1st November 2011 outlining concerns that we had committed a possible breach of Condition 1 of our licence and indicating that Network Rail will incur a significant fine for each percentage point of PPM we fall short. Introducing any additional services on the south end of the route will adversely impact Network Rail's ability to deliver the agreed JPIPs which aim to bring performance back to satisfactory levels. Moreover, the current off-peak 'firebreaks' in both directions at the south end of the WCML to/from Euston, currently used as an aid to service recovery in the event of major disruption, would be removed from the timetable if these proposals were accepted. This is supported by previous modelling outputs, including the 'Timetable Robustness Analysis of Alliance Rail and DfT Aspirations for the West Coast Main Line', published in the Summer of 2012. For these reasons, together with the timetable robustness issues raised jn section 7; Network Rail cannot support the introduction of further additional services.

2.10 Until the Power Supply Upgrade Project has been fully delivered in June 2015, it will not be possible to accommodate all of the additional services that aspirants are seeking to operate on the south end of the WCML, where these are operated by electric traction,

2.11 Asset reliability on the WCML is not where Network Rail would like it to be, for example it could not support additional services in the Norton Bridge area until the Grade Separation project has been completed as part of the Stafford Scheme. The schemes described in section 10 are intended to address the asset reliability issues currently impacting the route.

2.12 Our ability to undertake daytime maintenance on the route is already severely restricted due to the frequency and pattern of services. The addition of the LM additional paths from the December 2012 timetable and the two further additional paths under consideration in this report will reduce any possibility for minimal access to virtually nil and little work would be viable in the remaining space between services.

2.13 Network Rail's New Measurement Train (NMT) currently operates in one of the additional paths being sought by Timetable Participants. It operates on a two-weekly frequency (normally on a Tuesday or Wednesday) and is critical to the maintenance strategy and delivery of efficiencies which Network Rail is committed to deliver. These paths would need to be preserved.

2.14 In our professional opinion, the complexity of the timetabling issues identified (see 2.3 & 2.4), the performance issues raised (see 2.9), the power supply and asset reliability constraints (see 2.10 and 2.11), together lead us to conclude that it would be inappropriate to sell any further access rights on the WCML at this time. Once the planned infrastructure and power supply upgrades have been delivered and the work of the cross industry ESG for the WCML for December 2016 is completed, Network Rail will be in a stronger position to make the right decision for the industry, with a full understanding of the trade-offs between capacity use, performance and cost.

3. Introduction

3.1 The ORR is currently considering a number of applications for new or revised access rights over the West Coast Main Line. The ORR asked Network Rail to review the aspirations and assess whether they could be accommodated within the existing spare capacity on the route.

3.2 The aspirations relate to timetable changes being proposed for introduction by three operators during the period between December 2013 and some point in the 2015 timetable year (the latter date is subject to one of the operators taking delivery of rolling stock, that they will need in order to operate their proposed timetable).

The three operators are:

- Alliance Rail
- First TransPennine Express
- InterCity West Coast

3.3 Network Rail met with Timetable Participants on an individual basis to discuss their aspirations.

3.4 The work completed here has not included any aspirations that other timetable participants might have for timetable changes on the WCML.

3.5 The remit, as agreed with the ORR, did not include a requirement to RailSys model the impact of the proposed services, due to the limited amount of time Network Rail was given undertake this work.

4. Approach

4.1 Network Rail has issued a number of reports in connection with capacity and Access Rights on the WCML, the most recent of these were issued in December 2011 and July 2012. The report issued in December 2011, covered a high level analysis of aspirations received from timetable participants to run new or amended services. The report issued in July 2012, modelled the outputs of the December 2011 report using a single modelling tool RailSys, to assess the performance robustness of operating the additional services.

4.2 This report uses new performance analysis, which did not form part of the input to the conclusions drawn in the previous report issued in July 2012. However, that report did show that in the event of major disruption, the time taken to recover the timetable increased noticeably with additional services in the timetable. That report did not include the additional London Midland 110mph off-peak services, all paths were assumed to be conflict-free, it only modelled the south end of the WCML and did not include the impact at those locations where long distance trains terminate, such as Birmingham New Street and Manchester Piccadilly.

4.3 Network Rail conducted an assessment to determine whether the proposed services could be accommodated on the WCML between London Euston and Carnforth (including the route between Preston and Blackpool North).

4.4 To understand the impact of the aspirations, this assessment was split into two stages; a timetable capacity analysis and a performance assessment (including Operational Performance, Maintenance, Safety and Power Supply). This report summarises the analysis and key findings.

4.5 The proposed timetable for each of the three operators was overlaid on top of the December 2012 timetable. The process sought to identify whether each of the proposed services could be accommodated, both in isolation, and when combined in pairs, with services being proposed by the other applicants.

5. Assumptions

5.1 Timetabling Assumptions

5.1.1 The source timetable for the analysis was the December 2012 for SX, covering the period between 06:00 and 21:00.

5.1.2 Our analysis has not considered the consequential impact on operators' services away from the WCML.

5.1.3 The source timetable also included London Midland's 110mph services (both off-peak and peak), in line with the ORR's minded to decision of 11 December 2011 (Note: Train Planning Rule junction margin conflicts between London Midland's evening peak aspirations and other services in the Down direction have not yet been fully resolved at Ledburn Junction).

5.1.4 The analysis made use of work already undertaken by Network Rail and the industry in the Chat Moss Electrification ESG, and previous work undertaken by Network Rail in 2010 and 2011, concerning capacity use on the West Coast Main Line.

5.1.5 The base position for freight included those paths validated in the December 2012 Timetable at the point the base was taken during August / September 2012.

5.1.6 Aspirations for paths were discussed with Timetable Participants. These are outlined in sections 5.2 to 5.5 below.

5.2 Alliance Rail

5.2.1 The analysis included the West Coast Main Line element of the proposed services between London Euston and Blackpool North / Cumbrian Coast / Bradford / West Yorkshire, departing London Euston at xx.33 and xx.36, and corresponding return workings.

5.2.2 The pattern of services over the WCML assumes that three trains will operate every two hours (an alternating hourly service to/from Bradford or West Yorkshire and an alternating two-hourly service to/from Blackpool North or the Cumbrian Coast).

5.2.3 Departures from London Euston to Blackpool North will be at 07:xx, 08:xx, 09:xx, 13:xx, 17:36 and 19:xx. From London Euston to the Cumbrian Coast at 11:xx and 15:xx, with a 21:xx to Crewe.

5.2.4 The first arrival at London Euston is assumed to be at around 08.55, from Crewe rather than Blackpool North. Arrivals will then be between 10.00 and 11.00 from Blackpool North, 12.00 and 13.00 from Carlisle, repeating the alternating pattern as in the down direction. There would only be one further arrival from Carlisle, probably arriving between 18.00 and 19.00, with all other arrivals from Blackpool North.

5.2.5 Services between London Euston and Bradford / West Yorkshire commence with a 06.xx and end with a 20.xx. In the return direction arrivals at London Euston are between 08.xx and 22.xx.

5.2.6 The analysis did not make any assessment of whether these services could be accommodated on the Cumbrian Coast or whether Bradford / West Yorkshire services could be accommodated beyond the point at which they diverge from the West Coast Main Line. The analysis did however seek to identify whether the Blackpool North services could be accommodated between Preston and Blackpool North (and vice versa).

5.3 InterCity West Coast

5.3.1 The analysis included services between London Euston and Blackpool North / Lancaster, departing London Euston at xx.33, and corresponding return workings. The analysis also included an assessment of whether these services could be accommodated between Preston and Blackpool North. The analysis did not include any future aspirations beyond the 2014 timetable year.

5.4 First TransPennine Express

5.4.1 The analysis included the additional services which will result in an hourly electric service between Manchester Airport and Scotland. The analysis did not include an assessment of whether a 5th TransPennine service could be accommodated.

5.5 Other Operators

5.5.1 Our analysis has only included the additional services which the ORR asked Network Rail to consider in its analysis. The work completed here has not included any aspirations that other timetable participants might have for timetable changes on the WCML.

5.6 Rolling Stock/Timing Load Assumptions

5.6.1 Alliance Rail

125mph capable rolling stock with tilt that can maintain Sectional Running Times (SRTs) in line with a Class 390.

5.6.2 First TransPennine Express

This project assumes that Class 350/4s are procured to operate electrified services between Manchester Airport and Scotland during the 2014 Timetable year.
It is planned that the Class 350/4 EMUs will have a 110mph capability and this was the assumed timing load used. During particularly busy times of the week, some paths are likely to be timed for Class 185 DMUs, allowing TPE to operate pairs of Class 185s to provide additional capacity.

5.6.3 InterCity West Coast

125mph capable rolling stock with tilt (Class 390s on Euston – Lancaster services; Class 221s / Class 390s on Euston – Blackpool North services).

6. Timetable Capacity Analysis

6.1 Timing Loads

The analysis of the xx.33 path was undertaken using Class 390 and Class 221T timing loads. The analysis of the xx.36 path was undertaken using a Class 390 timing load, as agreed in the remit. It should be noted that the performance characteristics of a Class 221 are such that timing of these services in the xx.33 path below results in an extended journey time.

6. 2 Access Rights

The scope of this analysis covered London Euston to Carnforth (inclusive) and Preston to Blackpool North, It did not include any other routes; i.e. our analysis has not considered the consequential impact on the Access Rights of operators' services outside of this scope. It also took account of the change to Virgin Trains' track access contract to quantum rights only, from December 2013.

Quantum: With the exception of Northern's Liverpool – Blackpool North services, there is no impact on the Access Rights of those paths we have investigated. Without further detailed timetable analysis, we are unable to confirm whether Northern's contracted quantum between Liverpool and Blackpool North could be accommodated in the current timetable.

Journey Time/Frequency: There is no impact on the Access Rights of those paths we have investigated.

The ability to accommodate the proposed services without impacting on the Access Rights of another operator, does not in itself equate to a conclusion that any or all of the proposed services could be accommodated without significant change to the timetable in locations including (but not limited to) Birmingham, Glasgow, Liverpool and Manchester, arising from consequential retimings.

6.3 Timetable Analysis

6.3.1 Key issues affecting xx.33 departure from Euston:

- Conflict at Crewe Basford Hall Junction with Virgin Trains' hourly North Wales/Chester train which crosses from Up Slow to Up Fast at this point (it cannot cross at Crewe station due to conflicting with the xx.30 from Euston).
    - This could be resolved by the North Wales/Chester starting 5 minutes earlier from its origin, but this would result in a 5 minute increase in its journey time, or require significant re-cast of services between Rugby and Euston.
    - This would not impact on contractual rights as Virgin's rights will be quantum only.
- The proposed path runs through London Midland's xx.01 Birmingham New St – Liverpool Lime St in the Winsford area.
    - Amending the stopping patterns of LM's Birmingham – Liverpool services (so that the xx.01 from Birmingham calls at Penkridge vice Hartford, and the xx.34 from Birmingham calls at Hartford vice Penkridge) is a potential solution
    - This has no impact on overall journey times, so does not contravene London Midland's contractual maximum journey times, It may however have an impact on connectivity between local stations.
    - The effect of replicating the revised stopping pattern in the Up direction would also need consideration particularly in consideration of the additional possible requirement to retime LM's xx.34 Liverpool – Birmingham to run on the slow line between Crewe and Stafford if the stopping pattern of the Glasgow – Euston service is revised.

- Conflicts with ATW's xx:45 Llandudno – Manchester at Warrington BQ
    - This could potentially be resolved by running the ATW service slightly earlier and thus extends its journey time.
    - This could be accommodated without breaching the ATW's contractual maximum journey times
- Conflicts with ATW's xx:50 Manchester – Llandudno at Winwick Jn

    - This could potentially be resolved by running the ATW service slightly later, but this might impact on connection and turnround times, particularly if the return working is also retimed as noted above.
    - This could be accommodated without breaching ATW's contractual maximum journey times
- Conflicts at Springs Branch Junction with both the hourly Liverpool – Blackpool and Blackpool - Liverpool services (operated by Northern)
    - In the Down direction, the ability to retime the Liverpool – Blackpool train is restricted by the presence of the following Birmingham – Edinburgh/Glasgow train.
    - In the Up direction, the ability to retime the Blackpool – Liverpool train later is restricted by the presence of the following Edinburgh/Glasgow – Birmingham train and the ability to retime earlier is restricted by the preceding Blackpool – Manchester Victoria and Blackpool – York trains.
    - The presence of a terminating service from Liverpool in platform 6 at Wigan North Western further complicates the issue in both directions.
- Conflicts with Northern's xx:33 Hazel Grove – Preston at Euxton Junction
    - The most likely solution would be to add pathing time to the Northern service.
- If operated by a diesel unit, there is a also a direct conflict with the xx.20 Birmingham New St – Edinburgh/Glasgow Central between Stafford and Crewe (this in turn would impact on the xx:40 Euston – Manchester Piccadilly)
    - An alternative is for this train to be overtaken by the xx.40 Euston – Manchester, by using the Slow Line between Amington and Colwich, as per the current 13.33 FO Euston – Lancaster, but this significantly impacts on journey time, as well as introducing the additional overtaking move.

Note: The xx.33 path is only vacant in off-peak hours; 16.33, 17.33 & 18.33 departures from Euston already exist.

6.3.2 Key issues affecting xx.36 departure from Euston:

- Conflicts with standard hour freight paths between Brinklow and Attleborough
    - Whilst the freight path could be retimed later in the immediate vicinity in most hours, the potential implications for the path further north (including the two-track section between Colwich and Milford & Brocton) should not be under-estimated.
    - In the December 2012 timetable there is 17 minute window between the xx.40 Euston – Manchester and the xx.46 Euston – Crewe at Brinklow, which provides a useful window for either a slow freight train or a succession of faster ones – the proposed additional path reduces this window to 13 minutes, so impacts on the capacity for freight.

Note: The xx.36 departure as assessed has a relatively slow journey time due to being overtaken by the xx.40 Euston – Manchester Piccadilly at Milton Keynes Central

6.3.3 Key issues affecting the xx.58 arrival at Euston:

- Conflict with Northern's Blackpool – Manchester Victoria train at Euxton Jn
    - This would require the Northern service to be retimed later towards Manchester Victoria and require reduced dwell times at one or more stations on the Chorley line.
    - This would not impact on overall journey times, and would be achievable within Timetable Planning Rules, although the reduction in station dwell times would increase the risk of a late arrival at Manchester Victoria.
- The proposed path runs through LM's xx.34 Liverpool Lime St – Birmingham New St between Crewe and Stafford.
    - The initial conflict can be overcome by routing LM's train on to the Slow Line, but this increases the interactions with freight trains and also results in a 3 minute later arrival at New St.
        - London Midland does not have a contractual maximum journey time for trains with this stopping pattern.

    - The consequential impacts between Stafford and Birmingham and particularly at New St have not been assessed, but could potentially be significant.
- There is only a 2 minute margin between this train and Cross Country's Bournemouth – Manchester service at Norton Bridge, which could have performance implications
- There is a conflict at Milton Keynes with LM's Euston – Birmingham train crossing from platform 5 to SL
    - This may require the LM train to run later between Milton Keynes and Northampton, impacting on its journey time.
    - These trains currently have a contractual maximum journey time of 56 minutes between Euston and Northampton; the current journey time is typically 52 minutes, giving 4 minutes available flex, which will be sufficient for those trains that we have reviewed.
    - In most hours there would be secondary impacts on other trains. Depending on the exact solution applied, either Down direction freight trains or Up direction (Virgin) passenger trains would be affected.

Note: The xx.58 assumed here to be an acceleration of the xx.40 Glasgow – Euston service, which in turn releases the existing path for an additional xx.39 Lancaster – Euston.

6.3.4 Key issues affecting the xx.11 arrival at Euston:

- Conflict with various freight trains on the two-track section between Weaver Junction and Winsford.
    - Due to the density of traffic on this two-track section, capacity for freight trains is already scarce and therefore retiming conflicting freight services may prove difficult task, and we are unable to confirm whether we would be able to resolve these issue, subject to further work on the timetable.
    - Due to the individual nature of most freight paths, there is no single solution.
    - Use of the Up Slow Line to recess a freight train is frequently *not* a workable option due to there often being a long wait until the next available path, and the resulting impact on freight transit times.

Notes:

1. The xx.11 arrival as assessed has a relatively slow journey time due to being overtaken by other trains at Rugby (12½ minute dwell) and Milton Keynes Central (5 minute dwell). This is in line with Alliance's timetable proposal.
2. This path could arrive Euston at xx.59, by reducing the extended dwell at Rugby, but only if the existing Glasgow – Euston train was not accelerated (i.e. only one additional up path, not two).
3. Alternatively, to accelerate the Alliance services would require significant retiming of following services.

6.3.5 Additional FTPE Manchester Airport – Scotland services

The additional services which FTPE are planning to operate between Manchester Airport and Scotland have been developed jointly with the industry through the Chat Moss Electrification ESG. This project has successfully resolved the majority of timetabling conflicts that would otherwise prevent the additional FTPE services from operating. This has built on work that Network Rail previously undertook for the DfT and FTPE in connection with the award of the franchise extension.

6.3.6 Additional Paths between Preston and Blackpool North

- In the Down direction, extension of either the xx.33 or xx.36 paths to Blackpool North appears to be workable, with little or no requirement for extended dwells at Preston. The xx.33 path from Euston would give an arrival at Blackpool North at approximately xx.11 and the xx.36 from Euston would arrive at approximately xx.28
- In the Up direction, the timing of the xx.08 arrival at Euston suggests a departure from Blackpool North at approximately xx.33; however this could not be achieved without retiming of other services between Blackpool and Preston. In the current standard hour, there are existing departures from Blackpool North to Preston (and beyond) at:
    - xx.20 (to Manchester Victoria)

    - xx.29 (to York)
    - xx.37 (to Liverpool)
    - xx.44 (to Manchester Airport)
- The retiming of any of these services could have considerable impacts on the pathing of other trains at many locations across the network, and also on the turnround times at the other end of their journeys.
- An alternative solution would be for the Euston train to depart earlier from Blackpool and have a longer dwell at Preston.
- The timing of the xx.11 arrival at Euston suggests a departure from Blackpool North at approximately xx.54, which would be better in terms of departures from Blackpool North, but might impact slightly on services from Blackpool South.
- An allowance for attaching / detaching an assisting diesel locomotive at Preston would be required where these paths are operated by Class 390s, during the period before electrification between Preston – Blackpool North is completed.

6.3.7 Acceleration of services between London and Glasgow

It should be remembered that part of the rationale for a franchised operator to introduce additional services between Euston and Lancaster / Blackpool is to enable to the acceleration of Euston – Glasgow (and return) services. The achievement of this in the Up direction has already been discussed herein. However, in the Down direction, the acceleration is less easy to achieve. Using the current xx.30 path from Euston, a faster path can be achieved to approximately Lancaster, by omitting the calls at Warrington Bank Quay, Wigan North Western and Lancaster (to match the Up direction calling pattern). The only issue south of Lancaster is a minor conflict with a TransPennine service at Euxton Junction, which can be easily resolved. North of Lancaster, there are numerous issues, which vary in detail by the hour, but they can be broadly categorised into:

- Conflicts with local passenger services in the Lancaster and Carnforth areas
- Conflicts with freight trains, particularly over the steeply graded sections to Shap and Beattock Summits

- Conflicts with local passenger services in the Motherwell and Glasgow areas.

Of these, the conflicts with freight trains are the most numerous and the most difficult to resolve. Although not examined in detail for this particular study, previous work on these areas indicates that this is a complex task, to which there may be no simple solutions. The difficulty of reconciling slow freight trains (particularly those which are hauled by a single Class 66 diesel) and high speed passenger trains should not be underestimated.

The issues relating to accelerating a sample of Euston – Glasgow services are detailed in Appendix 2.

6.4 Capacity Analysis Conclusions

Our analysis of the proposed xx.33 (and return) paths has identified a number of significant timetabling conflicts with the hourly Alliance/ICWC proposition as evidenced by our analysis in sections 6.3 and 6.5 and Appendix 1. The analysis shows that the majority of the direct conflicts could be resolved. In our professional opinion however, resolution of other consequential conflicts, particularly in the Birmingham, Glasgow, Liverpool and Manchester areas will require significant timetable work. Our judgement is that this should form an input to the Event Steering Group (ESG) for the WCML

The xx.36 path (and return) could be accommodated by being overtaken at a number of locations. We cannot accommodate these trains in the current timetable without adopting this approach. It should be noted that as well as being overtaken, these services also make more calls than other comparable services on the route and as a result have a journey time between London Euston and Preston of 2 hours 27 minutes in the down direction (against a normal journey time of around 2 hours 8 minutes), and in the up direction 2 hours 45 minutes (against a normal journey time of around 2 hours 10 minutes). The criticality of these timetabled overtaking moves at Milton Keynes in the Down direction and Rugby and Milton Keynes in the Up direction is such that any delay to these services will have a knock-on impact on following trains, thereby reducing the robustness of the timetable.

The additional services which FTPE are planning to operate between Manchester Airport and Scotland have been developed jointly with the industry through the Chat Moss Electrification ESG. This project has successfully resolved the majority of timetabling conflicts that would otherwise prevent the additional FTPE services from operating. Network Rail would be comfortable in selling the additional rights needed to operate these additional services.

7. Performance Impact

7.1 Performance

7.1.1 Current Performance

To understand the current performance, the performance of long distance services currently operating on the route has been examined. **Figure 1** shows the delay to Virgin Trains only for incidents occurring between Euston and Preston (only the core route has been examined, therefore branches and route for Northampton, Birmingham, Manchester and Liverpool are not included). The bar charts represent the share of delay ownership. The line graph shows a comparison between Virgin PPM moving annual average targets and period results (this covers the whole area of geographic operation, not just Euston- Preston). The PPM target has not been achieved in any of the last 13 periods.

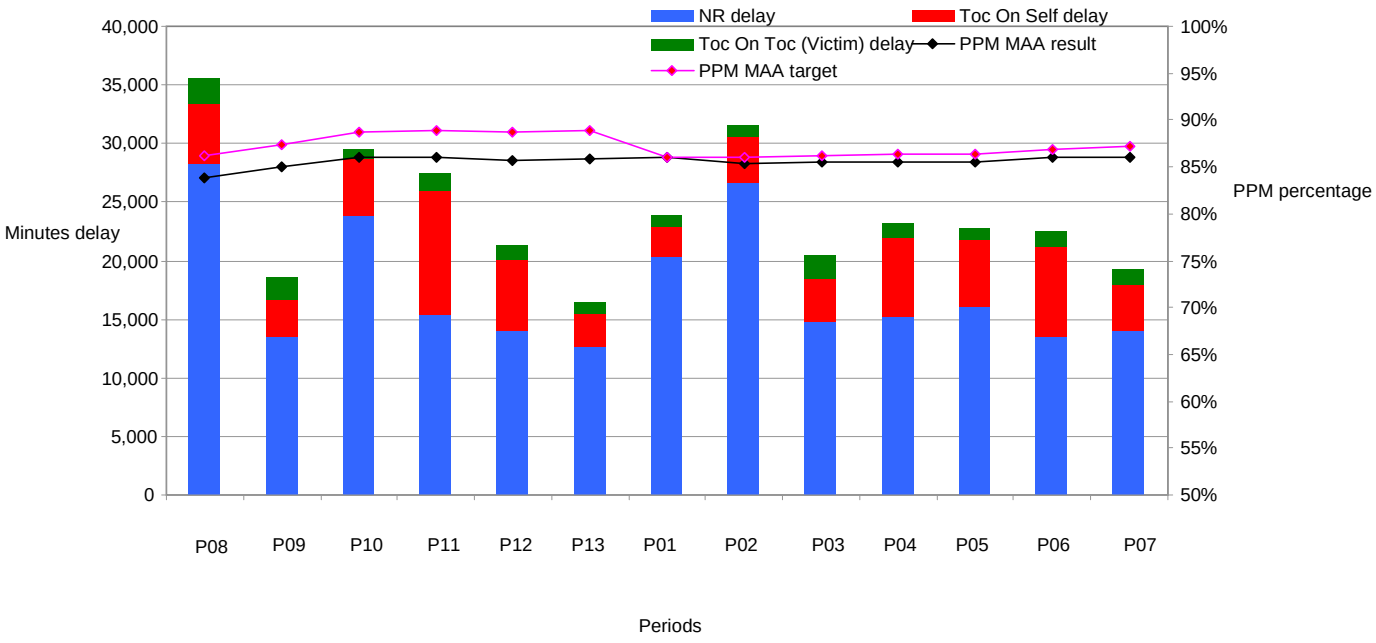


Figure 1 Delay to Virgin Trains and PPM MAA (actual v target), Period 08 2011/12 to Period 7 2012/2013*
***only includes delay from incidents between Euston and Preston)**

Delay per incident can be affected by the number of trains in operation, with the risk that operating more trains could increase the delay incurred for each incident as reactionary delay increases.

Figure 2 shows the moving annual average for DPI between Euston and Preston.

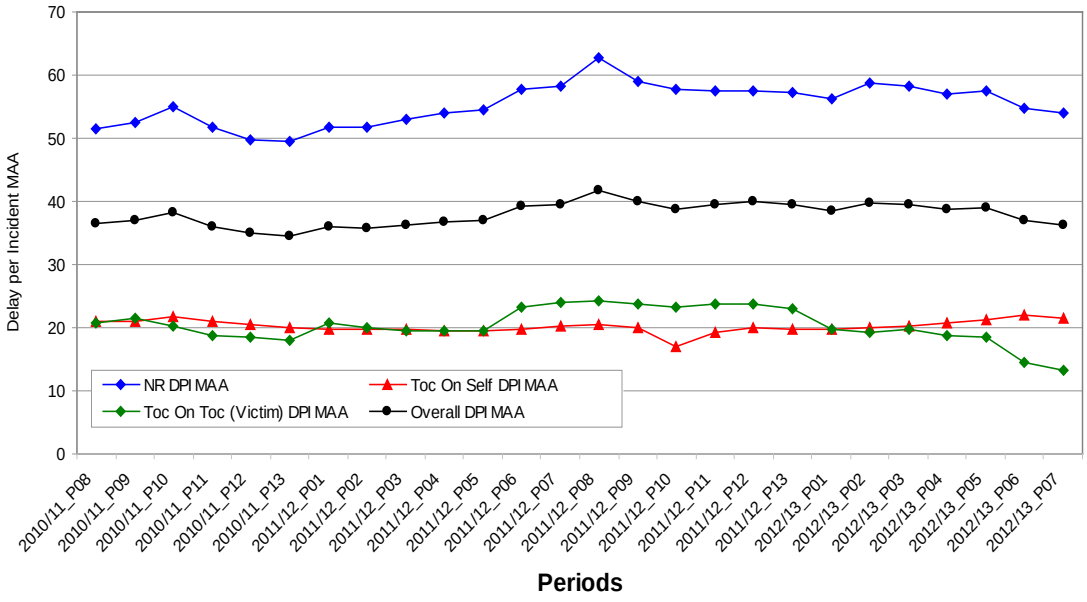


Figure 2 Delay per Incident MAA, Period 08 2010/11 to Period 7 2012/2013*

*only includes delay from incidents between Euston and Preston)

Figure 3 shows the Network Rail delay split by JPIP (Joint Performance Improvement Plan). This graph is useful as it shows that there are many different types of incident which affect the core route on the WCML.

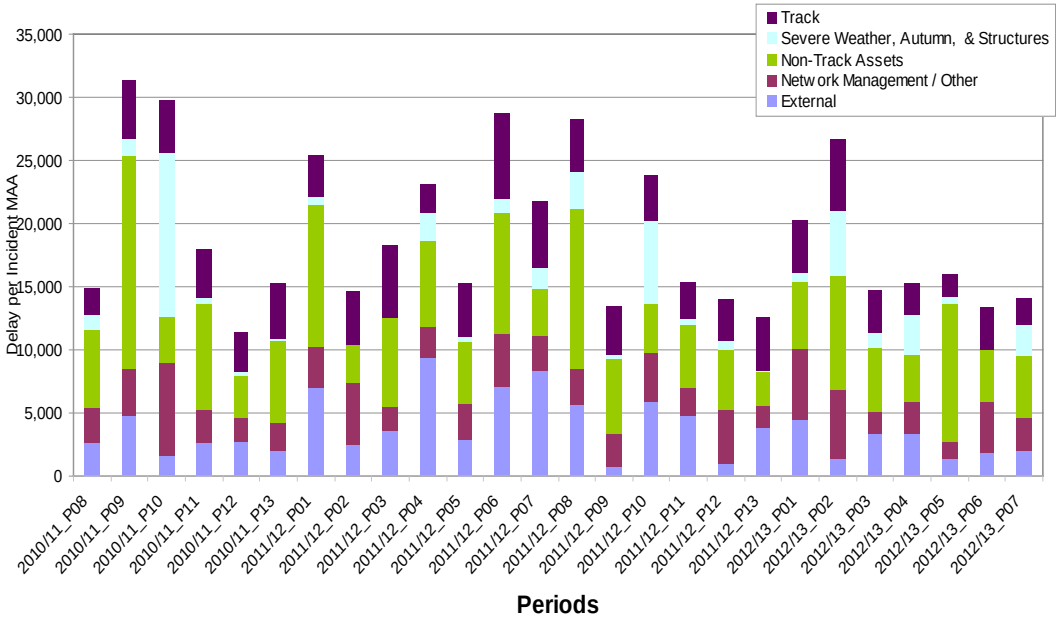


Figure 3 Split of NR delays by JPIP category, Period 08 2010/11 to Period 7 2012/2013*
***only includes delay from incidents between Euston and Preston)**

7.1.2 High Level Review

To understand the impact on performance of the change to the train service on the WCML, across the route as a whole, the first piece of analysis reviewed the likely impacts of the proposed services. **Figure 4** shows the outcome of this review.

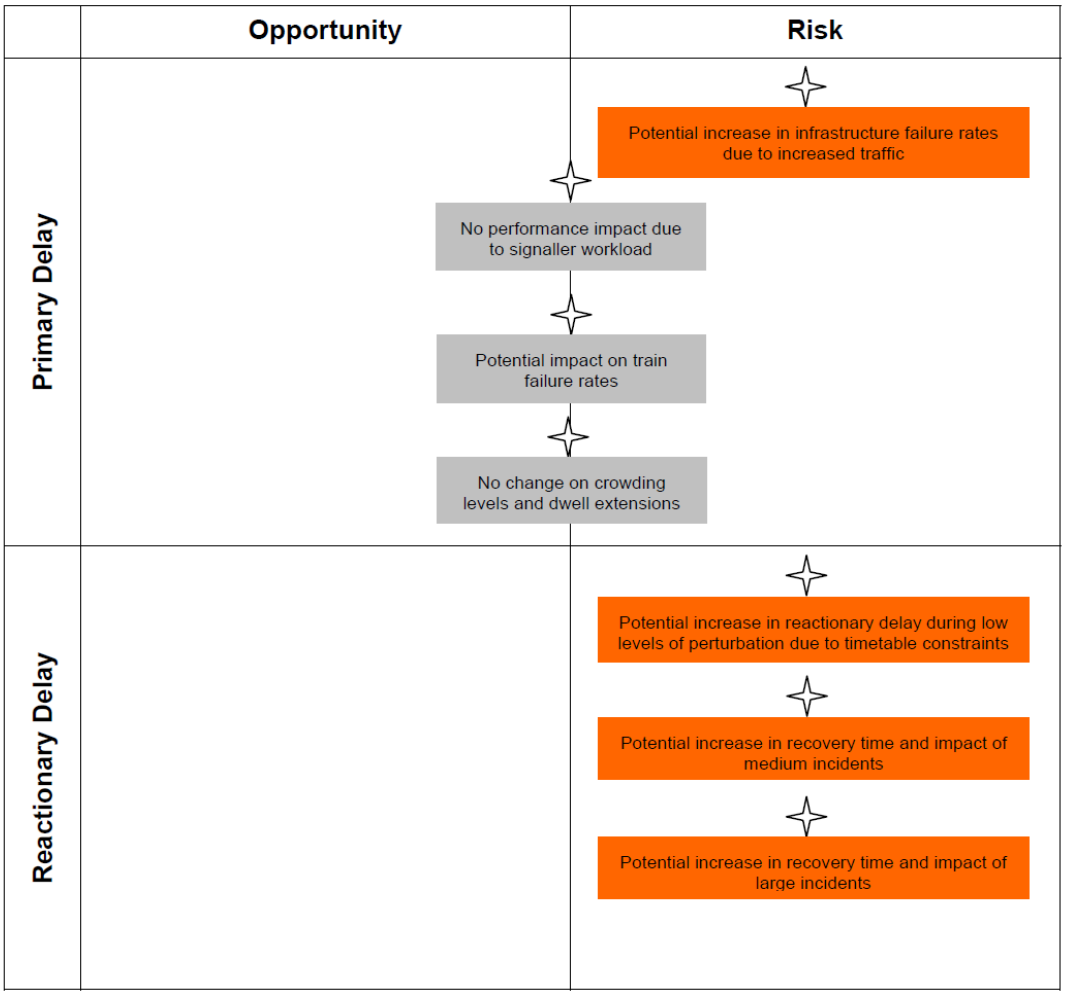


Figure 4 High Level Assessment of possible impact on performance

The outcome of the high level analysis allowed more detailed examination of the risk areas to be undertaken. No opportunities were identified as part of the review. The performance impact of passenger crowding and signaller workload during normal operations was deemed negligible therefore no further analysis has been undertaken.

7.1.3 Performance Impact of Rolling Stock

The Alliance proposal would introduce new rolling stock onto the route (either in the form of a 6-car Pendolino (as recently advised), or another type of tilting rolling stock with performance characteristics comparable to those of a Class 390. No quantification can be made on the performance impact of the latter - it is assumed that the rolling stock would be reliable. The key area of concern to performance of the route is the type of train and how it could be recovered in the event of failure. This requires further information on the proposed rolling stock and their coupling equipment, and how electric trains would be operated over non-electrified routes.

7.1.4 Infrastructure Failure Rates

The West Coast mainline is constrained in its operation at a number of locations. Norton Bridge is one of the most critical. Its asset reliability is not where it should be and it could not support additional services in that area until the Norton Bridge Grade Separation has been completed as part of the Stafford Scheme. The schemes described in section 10 are intended to address the asset reliability issues currently impacting the route.

7.1.5 Impact of every day levels of perturbation

The timetable was reviewed at key locations to ascertain the level of timetable robustness. Appendix C and D demonstrate, on the specific paths reviewed just how tightly trains are pathed. A critical aspect of the WCML timetable structure is that services do not only operate between two points, they also have numerous interactions on any given journey that could result in any delay being transferred across the wider network. On such a complex timetable as this, having little or no available slack in the paths gives greatly reduced timetable robustness.

Headways are generally planning compliant throughout but many have no planning headway slack. If additional services are to operate on the route, we would need to review a number of locations, the most significant of which is Euxton Junction where

some headways are non-compliant with current planning rules, as a result of the additional paths; further work is needed to resolve these issues.

Our report published in July 2012, assessed the impact of every day levels of perturbation on the route and concluded operating both Alliance and InterCity West Coast aspirations would, on a normal working day, lead to timetable performance being less robust.

On the upgraded parts of the WCML (south of Colwich), where technical headways are about 110 seconds, this will mean that on 3 minute (180 seconds) planning headway, any train(s) later than 70 seconds will impact on the following train with adverse signal sequences.

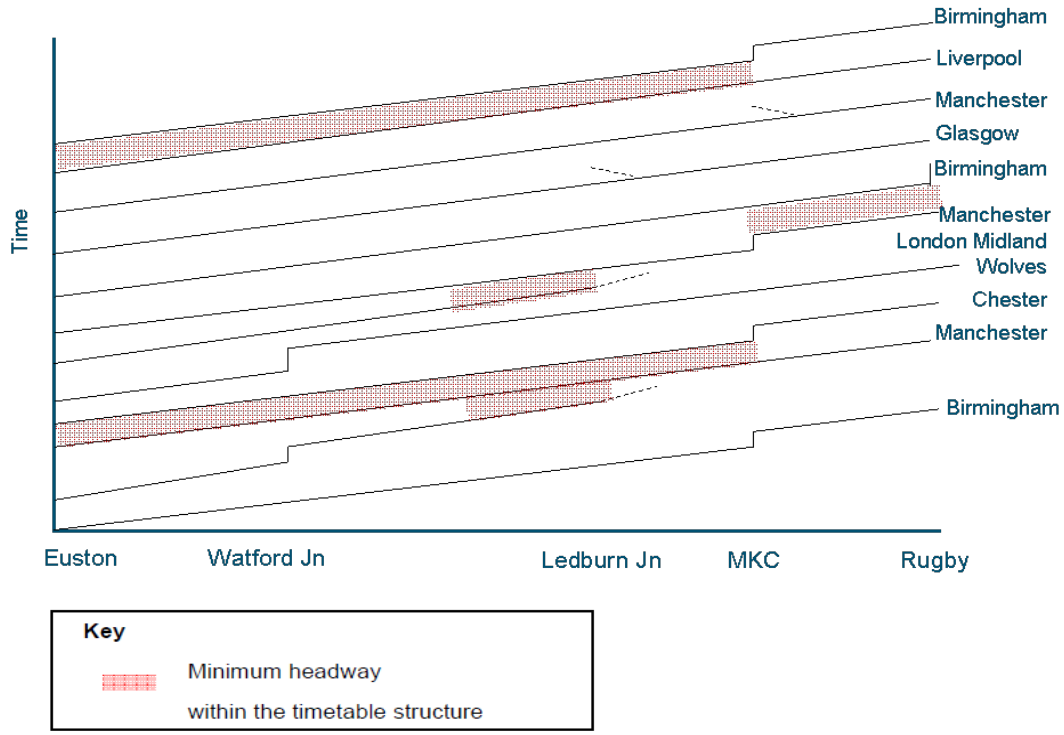
7.1.6. Constraint Points and current performance

One of risks identified to introducing the new service level is through the removal of flexibility within the timetable to recover from small levels of perturbation which occur in the system daily (such as late departure or dwell overruns). Mitigations can be introduced to reduce minor perturbations but these minor perturbations will always continue due to the nature of the network we are delivering. Therefore the proposed service structure has been reviewed to understand the flexibility available within the plan to recover from small perturbations.

Figure 5 Illustration of the train graph comparison in the Down direction between May 2012 and proposed Dec 2013

Figure 5 shows a comparison between the number of services on minimum headway in the May 2012 timetable compared to the proposed timetable for December 2013. Overall 2 additional services are contained within this section, the London Midland service introduced in December 2012 and the proposed long distance path for 2013 (either Open Access or ICWC). The increase in train paths requires closer scheduling of services between Rugby and London Euston which results in approximately double the amount of minimum margin running than was previously seen over this section.

May 2012



December 2013

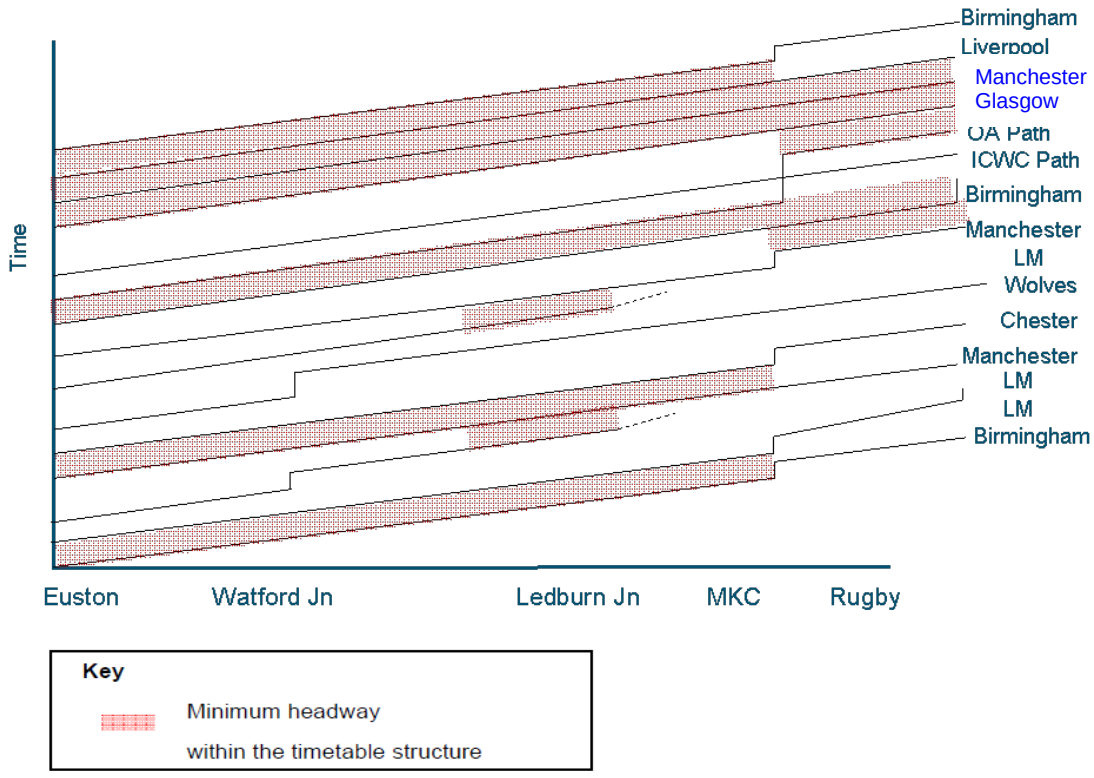


Figure 6 Timetable graph of May 12 Structure in the Up direction with performance figures for Time to 5 mins (actual v WTT for Period 5 to Period 7 2012/13 between 11:53 and 12:15 SX)

Figure 6 shows the Time to 5 figures for 60 days of weekday running in the May 2012 Timetable. This shows that a minimum of 15% of the time these long distance services are running over 5 minutes outside their scheduled path. The long distance services come from various origins and have to meet their scheduled path to deliver the timetable south of Rugby. The timetable structure allows some flexibility in these paths so that any delay incurred north of Rugby does not knock on to the following services south of Rugby. An example is the Liverpool Path which runs directly behind the Birmingham path but then has a 6 minute gap before the next Manchester path. To examine this in more detail the lateness of the Liverpool path has been examined between periods 5 and 7 2012/13.

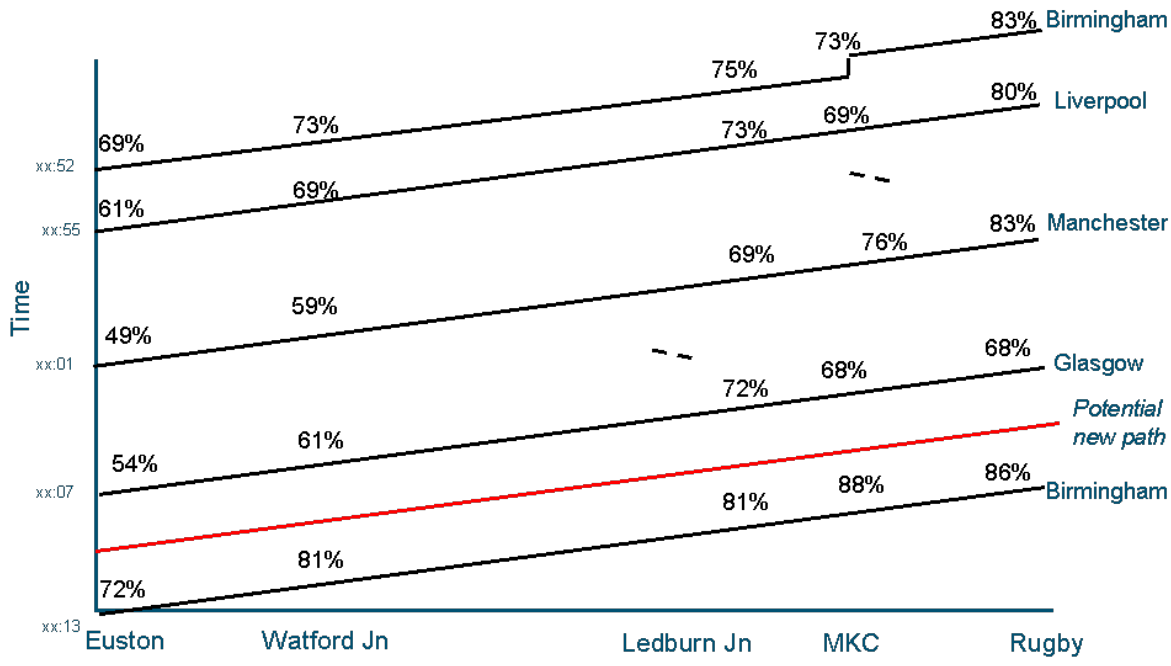


Figure 6 Key

Proposed path

- - FL to SL crossing moves in Down direction

Figure 7 Lateness profile of the Up Liverpool off peak path (Periods 5 to 7 2012/13)

Figure 7 shows that for the 3 periods examined 31% of trains arrived between 1 and 3 minutes late and 18% of trains arrived between 4 and 6 minutes late. Therefore 50% of the time the Up Liverpool off-peak service is using the gap in the timetable prior to the Manchester service. The proposed re-timing of the Glasgow service to arrive in Euston between the Liverpool and Manchester service would result in any delay affecting all three services in this flight with no flexibility in the timetable structure to allow for small amounts of lateness.

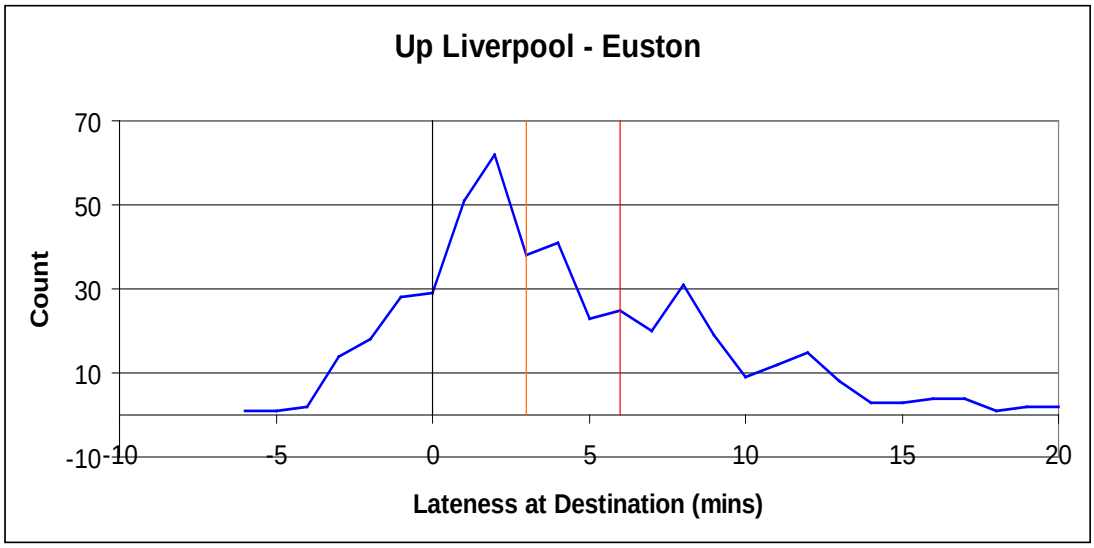


Figure 7 Key

On-time arrival

3 minutes lateness

6 minutes lateness

7.1.7 Ability to recover from minor everyday perturbation

Introducing new services will remove the flexibility within the timetable to recover from small levels of perturbation which occur in the system daily. A comparison of the Up direction timetable shows that there will be approximately double the amount of minimum planning headway running compared today which greatly increases the chance of delay propagation to other services.

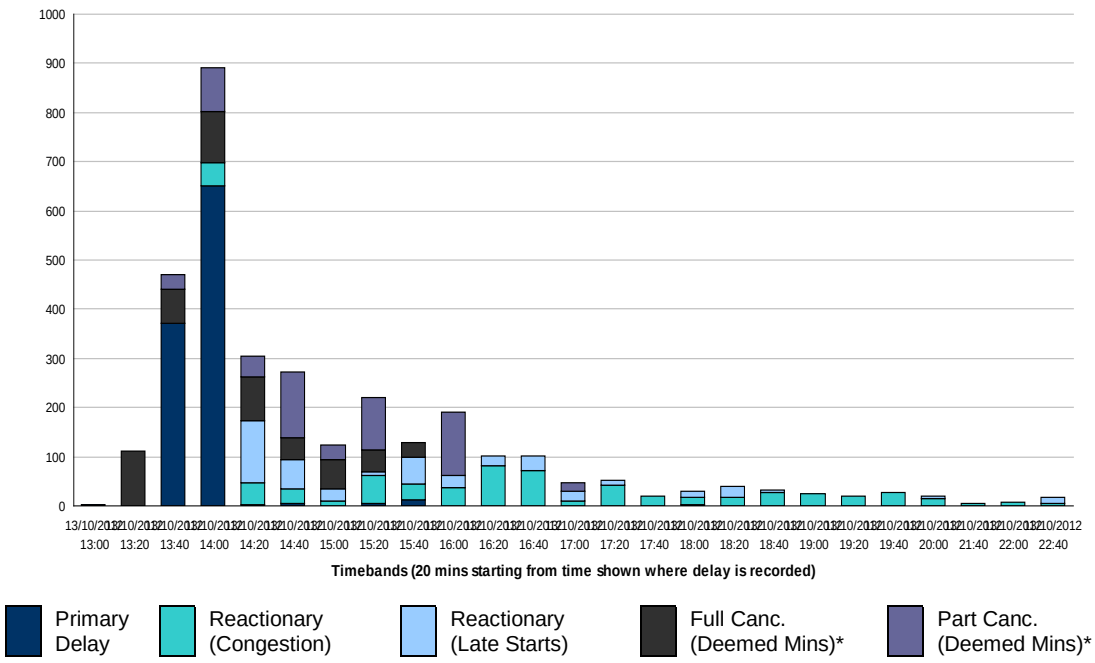
7.1.8 Impact of medium size incidents

The increase in number of services in operation when a medium sized incident occurs (medium is defined as a primary delay incident of 10 to 60 minutes) will introduce further risks. These incidents will require the train service to be altered to recover from the incident. Recovery plans include the cancelling of services and the diversion of services onto other running lines (where a diversionary route or alternative tracks are available) with the aim to get back to right time running as soon as possible.

To understand the impact of additional services on the route an incident which occurred in October 2012 has been examined. The incident occurred on WCML south at Headstone Lane (between West London Junction and Bourne End Junction) where a trespass incident required an emergency isolation of the OLE. This resulted in no power for 37 minutes and all trains being brought to a stand. Figure 8 shows the delay profile of the incident and how the train service was recovered once the primary delay was over.

7.1.9 Ability to recover from medium size events

Work is still on-going reviewing the impact of a 20 minute event on the WCML with and without the proposed services to understand the scale of impact. Initial work suggests that there will be an increase in the reactionary delay and recovery time of the incident through introduction of additional services.



Total Delay Mins: 2,137 (Primary: 1,058, Congestion: 646 , Late Start: 433),
Total Cancellations: 35, PPM Failures: 70 **
*Cancellations shown as "deemed minutes" (Passenger Trains only).i.e. converted into their equivalent delay minutes
** A train is counted as a PPM failure if the delay attributed to this Incident causes it to be late at destination by more than its PPM threshold or if it's cancelled due to this incident

Figure 8 Incident Chart for 131067 Trespass at Headstone Lane

7.1.10 Regulatory Targets

Performance on the WCML continues to fall below the Regulatory Targets set for CP4. The ORR wrote to Network Rail on 1st November 2011 outlining concerns that we had committed a possible breach of Condition 1 of our licence and indicating that Network Rail will incur a significant fine for each percentage point of PPM we fall short. The introduction of any additional services on the south end of the route will adversely impact Network Rail's ability to deliver the agreed JPIPs which aim to bring performance back to satisfactory levels.

8. Maintenance

Given the timetable in operation on many parts of the West Coast Mainline, particularly south of Crewe, daytime access is already severely restricted. The addition of the LM additional path from Dec 12 and the two further additional paths being considered just reduces any possibility for minimal access to virtually nil. Little work is viable to be planned in these gaps.

8.1 Forecast timetable – maintenance opportunities

The table below shows *the limited opportunities which would be available to undertake inspection and preventative maintenance during the daytime.*

8.1.1 Forecast operation from Euston and headways - off peak Fast line

Train	Euston	Watford Junction
ICWC to Man. Picc.	xx.00	xx.12
	3 mins	3 mins
ICWC to BNS.	xx.03	xx.15
	4 mins	4 mins
ICWC to Liv.	xx.07	xx.19
	3 mins	4 mins
ICWC to HH/Chester	xx.10	xx.23
	3 mins	3 mins
LM to BNS. (100 mph)	xx.13	xx.26
	7 mins	6 mins
ICWC to Man. Picc.	xx.20	xx.32
	3 mins	4 mins
ICWC to Wolves	xx.23	xx.36-xx.38
	3 mins	4 mins
ICWC to Scotland	xx.30	xx.42
	3 mins	3 mins
ICWC addl. path	xx.33	xx.45
	3 mins	3 mins
Open Access path	xx.36	xx.48
	4 mins	4 mins
ICWC to Man. Picc.	xx.40	xx.52
	3 mins	3 mins
ICWC to BNS.	xx.43	xx.55
	3 mins	4 mins
LM to Crewe (110 mph)	xx.46	xx.59
	3 mins	3 mins
LM to BNS. (110 mph)	xx.49	xx.02-xx.03
	11 mins	9 mins

8.1.2 Forecast operation into Euston and headways - off peak Fast line

Train	Watford Junction	Euston
ICWC from Man. Picc.	xx.47	xx.01
	3 mins	7 mins
ICWC addl. path	xx.53	xx.08
	7 mins	3 mins
Open Access path	xx.57	xx.11
	3 mins	3 mins
ICWC from BNS.	xx.00	xx.14
	5 mins	6 mins
ICWC from Man. Picc.	xx.05	xx.20
	5 mins	7 mins
LM from BNS (100 mph)	xx.10	xx.27
	4 mins	5 mins
ICWC from Wolves	xx.14-xx.16	xx.32
	5 mins	4 mins
ICWC from HH/Chester	xx.21	xx.36
	3 mins	3 mins
ICWC from Man. Picc.	xx.24	xx.39
	5 mins	6 mins
LM from BNS (110 mph)	xx.29-xx.30	xx.45
	5 mins	4 mins
LM from Crewe (110 mph)	xx.35	xx.49
	3 mins	3 mins
ICWC from BNS.	xx.38	xx.52
	3 mins	3 mins
ICWC from Liv.	xx.41	xx.55
	3 mins	3 mins
ICWC from Scotland	xx.44	xx.58
	3 mins	3 mins

8.1.3 OLE and Track Tonnage Issues

It should be noted that the issue of infrastructure failures with an even more intense service could see infrastructure failures rise, and as a result of the increased service, Delay minutes Per Incident (DPI) will rise significantly.

Based on an optimistic view of 14 hour operation of 0600-2000 Mon-Sat (inclusive) the following occurs south of Rugby:

- Dec 2011 TT: 11 trains per hour average = 22 trains per hour up and down fast lines. 22 x 14 = 308 Trains Per Day (TPD).
- Dec 2012 TT: 12 trains per hour average = 24 trains per hour up and down fast lines. 24 x 14 = 336 TPD, an increase of 9.5% over Dec 2011 TPD.
- Future TT: 14 trains per hour average = 28 trains per hour up and down fast lines. 28 x 14 = 392 TPD, an increase of 27% over Dec 2011 TPD.

Operating additional TPD does not mean that DPI will rise in the same percentages. DPI will rise exponentially as a result of the additional services during times of perturbation.

It should however be noted that these additional paths greatly increase track usage and as such items like Overhead Line Equipment (OLE) pantograph passes and track tonnage rise significantly. The pantograph pass detail is particularly significant at neutral sections as it increases wear and requirements to “turn” or renew the equipment.

Based on the same assumptions as above, plus single pantograph per train only, the pan pass detail increments as follows on the fast lines:

- Dec 2011 TT: 308 trains per day, 2,156 per week and 112,112 per year.
- Dec 2012 TT: 336 trains per day, 2,352 per week and 122,304 per year. This is an annual increment of just over 9% in pan passes from the Dec 2011 detail.
- Future TT: 392 trains per day, 2,744 per week and 142,688 per year. This is an annual increment of just over 27% in pan passes from the Dec 2011 detail.

For pantograph passes over neutral sections requires, on average, rods to be turned at 16 months, turned again at 32 months and renewed at 48 months. With the optimistic forecast of a 27% increase in pantograph passes over Dec 2011 level, this will mean a change to neutral section maintenance, with a need to turn the rods at 12 and 24 months and renew at 36 months.

Based on the same assumptions as above, plus single unit per train only, the track tonnage detail increments as follows on the fast lines:

- Dec 2011 TT: (8 x Pendolino (9 car 466t), 1 x Voyager (5 car 282t) and 2 x 350 Desiro (4 car 175t)). 122,080t per day, 732,480t per week and 38,088,960t per year.
- Dec 2012 TT: (8 x Pendolino (9 car), 1 x Voyager and 3 x 350 Desiro (4 car)). 126,980t per day, 761,880t per week and 39,617,760t per year. This is an annual increment of just over 4% in track tonnage from the Dec 2011 detail.
- Future TT: (9 x Pendolino (9 car), 2 x Voyager and 3 x 350 Desiro (4 car)). 147,924t per day, 887,544 per week and 46,152,288t per year. This is an annual increment of just over 21% in track tonnage from the Dec 2011 detail.

The track will degrade quicker by between 5 and 10% on the optimistic increased tonnage over the current Dec 2011 tonnage levels.

8.1.4 New Measurement Train

It is also important to note that the paths for the New Measurement Train (NMT) will be taken by these additional paths being utilised, and it is difficult to see where additional paths could be found to accommodate the NMT. The NMT operates on a two-weekly frequency (normally on a Tuesday or Wednesday). Having identified paths for the NMT is critical to the maintenance strategy and delivery of efficiencies which Network Rail has committed to deliver.

8.1.5 Power Supply

From December 2012, with the introduction of the additional London Midland services, there will be 11 paths per hour on the route, off-peak. The power supplies on the route are currently being upgraded to support an enhanced timetable in December 2018. (Note: the 2018 timetable is a notional timetable, originally proposed by the Strategic Rail Authority in developing future infrastructure and power supply requirements). Until the upgrade is completed the fast lines will support only 12 paths per hour. Once the upgrade is complete the power supply will support the level of service shown in the 2018 column in the table below.

The table below shows the current and forecast usage of the WCML (as departures from London Euston).

Timetable	November 2010	Dec 2012	2018	A+2020
14.00 to 15.00	8	8	12	12
15.00 to 16.00	8	8	12	13
16.00 to 17.00	10	10	13	12
17.00 to 18.00	10	10	13	13

Note: Trains formed with Class 390 only. Does not include London Midland services (including the recently introduced 3rd train in each off-peak hour) which are assumed to be the same quantum as at November 2010.

Network Rail's Power Supply Upgrade project is delivering increased capability for the December 2018 timetable. This capacity is being delivered in two phases, phase 3A in July 2014 and Phase 3B in December 2015.

In order to understand what spare power supply capability will exist on the WCML in 2018 after Stafford/Norton Bridge remodelling has been delivered; we have used the following pattern of services from London Euston (all services below are assumed to be operated by Class 390s).

1	xx.00	Scotland
2	xx.03	Manchester
3	xx.06	Birmingham New Street
4	xx.09	Chester
5	xx.18	Carlisle
6	xx.22	Manchester
7	xx.25	Wolves
8	xx.37	Liverpool
9	xx.43	Manchester
10	xx.46	Birmingham New Street
11	xx.49	Birmingham New Street
12	xx.52	Liverpool
13	xx.56	Preston (peak hours only)

9. Operations and Safety

9.1 We believe that under normal operation, these services can be accommodated. The main issue comes during perturbation when the workload to the applicable signaller and controller will rise. With more trains on the network it will take longer for the signaller / controller to manage the aftermath of any perturbation in order to restore the service back to normal.

9.2 Contingency plan arrangements in the terms of capacity available during perturbation will not change from today. What may change is who utilises that reduced capacity. It is imperative that these arrangements are documented, agreed and signed off by all company Managing Directors prior to any timetable operation commencing.

10. Links to Other Projects

10.1 Bletchley

Reliability issues due to the age of the infrastructure and planned to be resignalled December 2012.

10.2 Watford

Reliability issues due to the age of the infrastructure and planned to be resignalled December 2014 and all S&C renewed by mid 2015.

10.3 Stafford

Reliability issues due to the age of the infrastructure and planned to be resignalled December 2015.

10.4 Norton Bridge

Reliability issues and capacity constraints due to the age and layout of the infrastructure. Planned to be resignalled / remodelled in stages between August 2016 and August 2017. The scheme, in conjunction with Stafford resignalling will support delivery of two additional fast line paths to/from Euston in the off-peak, one additional path per hour on the Birmingham-Manchester axis and one additional freight path per hour through Stafford.

10.5 Northern Hub / North West Electrification (NWE)

December 2013	NWE Phase 1
December 2014	NWE Phase 2
May 2016	NWE Phase 3 and Blackpool Resignalling/ Remodelling
December 2016	NWE Phase 4, Trans Pennine West Electrification and Northern Hub Phase 1
December 2018	Completion of Northern Hub Phase 2 and Trans Pennine East Electrification

Significant timetables changes are likely in December 2016 and December 2018 as a result.

10.6 Power Supply Upgrade (PSUP)

An upgrade project of the West Coast Mainline power supply system to support proposed future timetables (Stafford 2018 and A+2020 timetables (SRA)) over and above the current Virgin High Frequency (VHF) timetable.

10.7 High Speed 2 (HS2)

The development of the proposed new high speed line, initially between London and the West Midlands and then onwards to Manchester and beyond will significantly change the way the WCML is used. The line from London to the West Midlands and the connection to High Speed 1 (HS1) are expected to open in 2026, and the onward legs to Manchester, Leeds and the connection to Heathrow in 2032-33. Construction work for developing Euston Station is still being evaluated but will, at present planning assumptions; result in the number of operational platforms being available during construction reducing from 18 to 14.

11. Conclusions

11.1 Our analysis of the proposed xx.33 (and return) paths has identified a number of significant timetabling conflicts with the hourly Alliance/ICWC proposition as evidenced by our analysis in sections 6.3.1 and 6.3.3 and Appendix 1. The analysis shows that the majority of the direct conflicts could be resolved. In our professional opinion however, resolution of other consequential conflicts, particularly in the Birmingham, Glasgow, Liverpool and Manchester areas will require significant timetable work. Our judgement is that this should form an input to the Event Steering Group (ESG) for the WCML.

11.2 The xx.36 path (and return) could be accommodated by being overtaken at a number of locations. We cannot accommodate these trains in the current timetable without adopting this approach. It should be noted that as well as being overtaken, these services also make more calls than other comparable services on the route, and as a result have a journey time between London Euston and Preston of 2 hours 27 minutes in the down direction (against a normal journey time of around 2 hours 8 minutes), and in the up direction 2 hours 45 minutes (against a normal journey time of around 2 hours 10 minutes). The criticality of these timetabled overtaking moves at Milton Keynes in the Down direction and Rugby and Milton Keynes in the Up direction is such that any delay to these services will have a knock-on impact on following trains, thereby reducing the robustness of the timetable.

11.3 Without further detailed timetable analysis, we are unable to confirm whether Northern's contracted quantum between Liverpool and Blackpool North could be accommodated in the current timetable.

11.4 The ability to accommodate services without impacting on the Access Rights of another operator, does not in itself equate to a conclusion that any or all of the proposed services could be accommodated without significant change to the timetable in locations including (but not limited to) Birmingham, Glasgow, Liverpool and Manchester.

11.5 The additional services which FTPE are planning to operate between Manchester Airport and Scotland have been developed jointly with the industry through the Chat Moss Electrification ESG. This project has successfully resolved the majority of timetabling conflicts and, subject to remaining issues being addressed, Network Rail would be comfortable in selling the rights needed to operate these additional services. See section 6.7.

11.6 There are a number of significant projects currently underway, which are covered in Section 10. The timetable benefits of these projects are intended to be captured via the cross- industry ESG for the WCML, which will commence early in 2013 and develop proposals covering the future structure of the WCML timetable for the period from 2016 onwards.

11.7 Performance on the WCML continues to fall below the Regulatory Targets set for CP4. The ORR wrote to Network Rail on 1st November 2011 outlining concerns that we had committed a possible breach of Condition 1 of our licence and indicating that Network Rail will incur a significant fine for each percentage point of PPM we fall short. Any introduction of additional services on the south end of the route will adversely impact Network Rail's ability to deliver the agreed JPIPs which aim to bring performance back to satisfactory levels. Moreover, the current off-peak 'firebreaks' in both directions at the south end of the WCML to/from Euston, currently used as an aid to service recovery in the event of major disruption, would be removed from the timetable if these proposals were accepted. This is supported by previous modelling outputs, including the 'Timetable Robustness Analysis of Alliance Rail and DfT Aspirations for the West Coast Main Line', published in the Summer of 2012. For these reasons, together with the timetable robustness issues raised in section 7, Network Rail cannot support the introduction of further additional services.

11.8 Until the Power Supply Upgrade Project has been fully delivered in June 2015, it will not be possible to accommodate all of the additional services that aspirants are seeking to operate on the south end of the WCML, where these are operated by electric traction,

11.9 Asset reliability on the WCML is not where Network Rail would like it to be, for example it could not support additional services in the Norton Bridge area until the Grade Separation project has been completed as part of the Stafford Scheme. The schemes described in section 10 are intended to address the asset reliability issues currently impacting the route.

11.10 Our ability to undertake daytime maintenance on the route is already severely restricted due to the frequency and pattern of services. The addition of the LM additional paths from the December 2012 timetable and the two further additional paths under consideration in this report will reduce any possibility for minimal access to virtually nil and little work would be viable in the remaining space between services.

11.11 Network Rail's New Measurement Train (NMT) currently operates in one of the additional paths being sought by Timetable Participants. It operates on a two-weekly frequency (normally on a Tuesday or Wednesday) and is critical to the maintenance strategy and delivery of efficiencies which Network Rail is committed to deliver. These paths would need to be preserved.

11.12 In our professional opinion, the complexity of the timetabling issues identified (see 2.3 & 2.4), the performance issues raised (see 2.7), the power supply and asset reliability constraints (see 2.8 and 2.9), together lead us to conclude that it would be inappropriate to sell any further access rights on the WCML at this time. Once the planned infrastructure and power supply upgrades have been delivered and the work of the cross industry ESG for the WCML for December 2016 is completed, Network Rail will be in a stronger position to make the right decision for the industry, with a full understanding of the trade-offs between capacity use, performance and cost.

APPENDIX 1: Detailed list of conflicts for the paths assessed.

Key:

	Could be accommodated within the existing timetable.
	Would require minor retiming to other services
	Would require more significant changes to other services
	Significant issue, which we have been unable to resolve

Conflicts identified for xx:33 path from Euston to Lancaster calling at Warrington Bank Quay, Wigan North Western, Preston and Lancaster and using Class 390 Pendolino timings

General note: Euston platforming and conflicts in station throat not looked at.

xx.33 from London Euston (Class 390)

06:30 Euston - Lancaster	**T.Load: Cl.390**
Issues	**Severity**
Runs through 6S94 (WO)(Dollands Moor - Irvine) between Brinklow and Attleborough	
Clash with 1V74 (07:30 MAN-CMN) at Crewe	
Runs through 1F32 (07:01 BHM-LIV) between Winsford and Hartford	
Headway clash with 4F64 (MO)(Crewe Basford Hall - Garston) at Weaver Jn	
Headway clash with 1Q26 (NMT) between Warrington Bank Quay and Lancaster	
Headway clash with 2N72 (07:57 LIV-BPN) between Springs Branch Jn and Balshaw Lane Jn	
NOTE: Assumed to run at 06:30 (vice 06:33) and pick up standard path north of Milton Keynes. This is due to current '06:40' EUS-MAN running at 06:36 to allow extra call at WFJ, and thus this allows the 'aspired' 06:36 path to run at 06:33 and pick up pattern at MKC	

07:33 Euston – Lancaster	**T.Load: Cl.390**
Issues	**Severity**
Headway clash with 1H62 (07:35 EUS-MAN) between Euston and Milton Keynes Central. To resolve would need MKC stop removed from 1H62 so it runs as standard pattern at 07:40 from Euston	
Runs through 4M01 (Felixstowe - Barton Dock) between Brinklow and Attleborough	
Headway clash with 1S44 (08:20 BHM-EDB) at Stafford North Jn	
Clash with 1A13 (06:55 HHD-EUS) at Crewe Basford Hall Jn	
Runs through 1F34 (08:01 BHM-LIV) between Winsford and Hartford	
Runs through 0F41 (WO)(Garston - Arpley Sidings) between Weaver Jn and Acton Grange Jn	
Dependant on 08:30 EUS-GLC being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 1H83 (07:45 LLD-MAN) at Warrington Bank Quay	
Junction margin clash with 1D33 (08:50 MAN-HHD) at Winwick Jn	
Clash with 2F51 (09:04 PRE-LPY) at Springs Branch Jn	
Headway clash with 2N76 (08:57 LIV-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 4M06 (Mossend - Arpley Sidings) QJ Strategic path at Balshaw Lane Jn	

Clash with 2N22 (08:32 HAZ-PRE) at Euxton Jn	
Clash with 2N05 (09:17 OMS-PRE) at Ribble Jn	
Headway clash and platform re-occupation issue with 1S47 (09:20 BHM-GLC) approaching Lancaster	

08:33 Euston - Lancaster	**T.Load: Cl.390**
Issues	**Severity**
Headway clash with 1S47 (09:20 BHM-GLC) at Stafford North Jn	
Clash with 1A18 (09:35 CTR-EUS) at Crewe Basford Hall Jn	
Clash with 1V77 (09:30 MAN-CMN) at Crewe	
Runs through 1F36 (09:01 BHM-LIV) between Winsford and Hartford	
Dependant on 08:30 EUS-GLC being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 1H84 (08:54 LLJ-MAN) at Warrington Bank Quay	
Junction margin clash with 1D34 (09:50 MAN-LLD) at Winwick Jn	
Clash with 2F57 (09:37 BPN-LPY) at Springs Branch Jn	
Headway clash with 2N80 (09:57 LIV-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N23 (09:33 HAZ-PRE) at Euxton Jn	
Same path as 1C71 (10:45 PRE-WDM) between Preston and Lancaster	

09:33 Euston - Lancaster	**T.Load: Cl.390**
Issues	**Severity**
Headway clash with 1S54 (10:20 BHM-EDB) at Norton Bridge	
Clash with 1A23 (08:55 HHD-EUS) at Crewe Basford Hall Jn	
Clash with 1V79 (10:30 MAN-MFH) at Crewe	
Runs through 1F38 (10:01 BHM-LIV) between Winsford and Hartford	
Dependant on 1S48 (09:30 EUS-GLC) being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 1H85 (09:45 LLD-MAN) at Warrington Bank Quay	
Junction margin clash with 1D35 (10:50 MAN-BNG) at Winwick Jn	
Clash with 2F63 (10:37 BPN-LPY) at Springs Branch Jn	
Headway clash with 2N84 (10:27 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N24 (10:33 HAZ-PRE) at Euxton Jn	

10:33 Euston - Lancaster	**T.Load: Cl.390**
Issues	**Severity**
Headway clash with 1S55 (11:20 BHM-GLC) at Stafford North Jn	
Clash with 1A28 (11:35 CTR-EUS) at Crewe Basford Hall Jn	
Clash with 1V81 (11:30 MAN-CMN) at Crewe	
Runs through 1F40 (11:01 BHM-LIV) at Winsford	
Clash with 1H86 (10:44 LLD-MAN) at Warrington Bank Quay	
Junction margin clash with 1D36 (11:50 MAN-LLD) at Winwick Jn	
Clash with 2F69 (11:37 BPN-LPY) at Springs Branch Jn	
Headway clash with 2N88 (11:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N25 (11:33 HAZ-PRE) at Euxton Jn	
Clash with 2N09 (12:17 OMS-PRE) at Ribble Jn	
Platform re-occupation issue with 1S55 (11:20 BHM-GLC) at Lancaster	

11:33 Euston - Lancaster	T.Load: Cl.390
Issues	**Severity**
Headway clash with 1S60 (12:20 BHM-EDB) at Stafford North Jn	
Clash with 1A33 (12:35 CTR-EUS) at Crewe Basford Hall Jn	
Clash with 1V83 (12:30 MAN-MFH) at Crewe	
Runs through 1F42 (12:01 BHM-LIV) between Winsford and Hartford	
Dependant on 1S58 (11:30 EUS-GLC) being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 1H87 (11:44 LLD-MAN) at Warrington Bank Quay	
Junction margin clash with 1D37 (12:50 MAN-LLD) at Winwick Jn	
Clash with 2F55 (12:37 BPN-LPY) at Springs Branch Jn	
Headway clash with 2N27 (12:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N26 (12:33 HAZ-PRE) at Euxton Jn	

12:33 Euston - Lancaster	T.Load: Cl.390
Issues	**Severity**
Headway clash with 1S65 (13:20 BHM-GLC) at Stafford North Jn	
Clash with 1A38 (12:24 BNG-EUS) at Crewe Basford Hall Jn	
Clash with 1V85 (13:30 MAN-TEN) at Crewe	
Runs through 1F44 (13:01 BHM-LIV) between Winsford and Hartford	
Dependant on 1S63 (12:30 EUS-GLC) being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 1H88 (12:44 LLD-MAN) at Warrington Bank Quay	
Junction margin clash with 1D38 (13:50 MAN-LLD) at Winwick Jn	
Clash with 2F61 (13:37 BPN-LPY) at Springs Branch Jn	
Headway clash with 2N76 (13:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N27 (13:33 HAZ-PRE) at Euxton Jn	
Runs through 4M12 (Leeds Stourton - Shap Summit) between Preston and Lancaster	

13:33 Euston - Lancaster	T.Load: Cl.390
Issues	**Severity**
Clash with 1A43 (14:35 CTR-EUS) at Crewe Basford Hall Jn	
Clash with 1V87 (14:30 MAN-MFH) at Crewe	
Runs through 1F46 (14:01 BHM-LIV) between Winsford and Hartford	
Dependant on 1S69 (13:30 EUS-GLC) being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 1H89 (13:31 BNG-MAN) at Warrington Bank Quay	
Clash with 2F67 (14:37 BPN-LPY) at Springs Branch Jn	
Headway clash with 2N80 (14:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N03 (15:17 OMS-PRE) at Ribble Jn	
Departure of 2Y61 (16:03 LAN-LDS) from Platform 1 just after 13:33 arrives. Breaks margin allowed in TPR and clashes with potential ECS path.	

14:33 Euston - Lancaster	**T.Load: Cl.390**
Issues	**Severity**
Clash with 4H17 (Wembley - Trafford Park) joining three track section at Brinklow	
Headway clash with 1S77 (15:20 BHM-GLC) at Stafford North Jn	
Clash with 1A48 (13:58 HHD-EUS) at Crewe Basford Hall Jn (assumes rerouting 1A48 for 1S71)	
Clash with 1V89 (15:30 MAN-PMD) at Crewe	
Headway clash with 1F48 (15:01 BHM-LIV) at Winsford	
Clash with 1D30 (15:50 MAN-LLD) at Winwick Jn	
Clash with 2F53 (15:37 BPN-LPY) at Springs Branch Jn	
Headway clash with 2N84 (15:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
IMPORTANT NOTE: Currently, 1S71 14:30 EUS-GLC has pathing time in it so that it matches Class 221 SRT's between Euston and Preston. This pushes the path back into the potential path of a 14:33 departure from Euston, and due to the interaction with the 15:20 BHM-GLC north of Stafford means that <u>if the 14:30 remains in its current timings there is no path for a 14:33 as per the standard pattern assessed here</u>. The list of conflicts above assumes that the 14:30 has been accelerated to standard pattern timings for a Class 390 south of Preston (i.e. the pathing time has been removed). Please see separate list of conflicts that accelerating the 14:30 as such will cause (below).	
14:30 Euston - Glasgow (conflicts south of Lancaster only)	
1A48 (13:58 HHD-EUS will need to cross to FL at Crewe Basford Hall Jn as per standard pattern (rather than Crewe station)	
1Q44 (TO) NMT path run through at Acton Grange Jn	
Conflict with 1H90 (14:40 LLD-MAN) at Warrington Bank Quay	

15:33 Euston - Lancaster	**T.Load: Cl.390**
Issues	**Severity**
Same path as 1Q27 (NMT) between Euston and Bletchley	
Headway clash with 1S80 (14:43 EUS-EDB) at Stafford North Jn	
Clash with 1V91 (16:30 MAN-MFH) at Crewe	
Clash with 1A53 (16:35 CTR-EUS) at Crewe Basford Hall Jn	
Runs through 1F50 (16:01 BHM-LIV) between Winsford and Hartford	
Dependant on 1S78 (15:30 EUS-GLC) being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 2F59 (16:35 BPN-LPY) at Springs Branch Jn	
Headway clash with 2N88 (16:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N20 (16:30 HAZ-PRE) at Euxton Jn	

16:33 Euston - Preston: Existing path	
17:33 Euston - Liverpool: Existing path	
18:34 Euston - Liverpool: Existing path	

19:33 Euston - Lancaster	T.Load: Cl.390
Issues	**Severity**
Same path as 1S55 (19:23 Willesden PRDC - Shieldmuir Mail Terminal) between Watford Junction and Tring	
Headway clash with 1P05 (FO)(18:46 EUS-PRE) between Crewe and Preston	
Dependant on 1S06 (19:30 EUS-GLC) being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 1H96 (19:42 LLD-MAN) at Warrington Bank Quay	
Clash with 2F59 (20:37 BPN-LIV) at Springs Branch Jn	

20:33 Euston - Lancaster	T.Load: Cl.390
Issues	**Severity**
Same path as 5D16 (Euston - Barton-under-Needwood) between Euston and Stafford	
Headway clash with 1P07 (20:30 EUS-PRE) at Amington Jn	
Clash with 1H97 (21:52 CTR-WBQ) at Warrington Bank Quay	
Runs through 2N84 (21:42 LIV-BPN) between Wigan North Western and Balshaw Lane Jn	
NOTE: Duplicates calls in very similar (existing) 20:30 Euston - Preston	

xx.33 from London Euston (Class 221)

Conflicts identified for xx:33 path from Euston to Lancaster calling at Warrington Bank Quay, Wigan North Western, Preston and Lancaster and using Class 221 Super Voyager timings

06:30 Euston - Lancaster	**T.Load: Cl.221**
Issues	**Severity**
Headway clash with 6S94 (WO)(Dollands Moor - Irvine) at Brinklow	
Clash with 1V74 (07:30 MAN-CMN) at Crewe	
Runs through 1F32 (07:01 BHM-LIV) between Winsford and Hartford	
Headway clash with 4F64 (MO)(Crewe Basford Hall - Garston) at Weaver Jn	
Headway clash with 1Q26 (NMT) between Warrington Bank Quay and Lancaster	
Headway clash with 2N72 (07:57 LIV-BPN) between Springs Branch Jn and Balshaw Lane Jn	
NOTE: Assumed to run at 06:30 (vice 06:33) and pick up standard path north of Crewe. This is due to current '06:40' EUS-MAN running at 06:36 to allow extra call at WFJ, and thus this allows the 'aspired' 06:36 path to run at 06:33 and pick up pattern at WFJ	

07:33 Euston - Lancaster	**T.Load: Cl.221**
Issues	**Severity**
Headway clash with 1H62 (07:35 EUS-MAN) between Euston and Milton Keynes Central. To resolve would need MKC stop removed from 1H62 so it runs as standard pattern at 07:40 from Euston	
Runs through 4M01 (Felixstowe - Barton Dock) between Brinklow and Attleborough	
Headway clash with 1S44 (08:20 BHM-EDB) at Stafford North Jn	
Clash with 1A13 (06:55 HHD-EUS) at Crewe Basford Hall Jn	
Clash with 1V75 (08:30 MAN-MFH) at Crewe	
Runs through 1F34 (08:01 BHM-LIV) between Winsford and Hartford	
Runs through 0F41 (WO)(Garston - Arpley Sidings) between Weaver Jn and Acton Grange Jn	
Clash with 1H83 (07:45 LLD-MAN) at Warrington Bank Quay	
Clash with 2F51 (09:04 PRE-LPY) at Springs Branch Jn	
Runs through 2N76 (08:57 LIV-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 4M06 (Mossend - Arpley Sidings) QJ Strategic path at Balshaw Lane Jn	
Clash with 2N22 (08:32 HAZ-PRE) at Euxton Jn	
Clash with 2N05 (09:17 OMS-PRE) at Ribble Jn	
Headway clash and platform re-occupation issue with 1S47 (09:20 BHM-GLC) approaching Lancaster	

08:33 Euston - Lancaster	**T.Load: Cl.221**
Issues	**Severity**
Headway clash with 1S47 (09:20 BHM-GLC) Stafford North Jn to Crewe	
Clash with 1V77 (09:30 MAN-CMN) at Crewe	
Runs through 1F36 (09:01 BHM-LIV) between Hartford and Acton Bridge	
Clash with 1H84 (08:54 LLJ-MAN) at Warrington Bank Quay	
Junction margin clash with 2F57 (09:37 BPN-LIV) at Springs Branch Jn	
Runs through 2N80 (09:57 LIV-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Headway clash and platform re-occupation issue with 1S44 (08:20 BHM-EDB) approaching Lancaster	

09:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Headway clash with 1S54 (10:20 BHM-EDB) Norton Bridge to Crewe	
Clash with 1V79 (10:30 MAN-MFH) at Crewe	
Identical path to 1F38 (10:01 BHM-LIV) between Hartford and Weaver Jn	
Clash with 1H85 (09:45 LLD-MAN) at Warrington Bank Quay	
Junction margin clash with 2F63 (10:37 BPN-LPY) at Springs Branch Jn	
Runs through 2N84 (10:27 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N24 (10:33 HAZ-PRE) at Euxton Jn	
Headway clash and platform re-occupation issue with 1S54 (10:20 BHM-EDB) approaching Lancaster	

10:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Same path as 1S55 (11:20 BHM-GLC) Stafford North Jn to Crewe	
Clash with 1V81 (11:30 MAN-CMN) at Crewe	
Runs through 1F40 (11:01 BHM-LIV) between Hartford and Acton Bridge	
Clash with 1H86 (10:44 LLD-MAN) at Warrington Bank Quay	
Runs through 2N88 (11:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N25 (11:33 HAZ-PRE) at Euxton Jn	
Headway clash and platform re-occupation issue with 1S55 (11:20 BHM-GLC) approaching Lancaster	

11:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Same path as 1S60 (12:20 BHM-EDB) Stafford North Jn to Crewe	
Clash with 1V83 (12:30 MAN-MFH) at Crewe	
Identical path to 1F42 (12:01 BHM-LIV) between Hartford and Weaver Jn	
Clash with 1H87 (11:44 LLD-MAN) at Warrington Bank Quay	
Runs through 2N27 (12:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N26 (11:33 HAZ-PRE) at Euxton Jn	
Headway clash and platform re-occupation issue with 1S60 (12:20 BHM-EDB) approaching Lancaster	

12:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Same path as 1S65 (13:20 BHM-GLC) Stafford North Jn to Crewe	
Clash with 1V85 (13:30 MAN-TEN) at Crewe	
Identical path to 1F44 (13:01 BHM-LIV) between Hartford and Weaver Jn	
Clash with 1H88 (12:44 LLD-MAN) at Warrington Bank Quay	
Runs through 2N76 (13:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N27 (13:33 HAZ-PRE) at Euxton Jn	
Runs through 4M12 (Leeds Stourton - Shap Summit) between Preston and Lancaster	
Headway clash and platform re-occupation issue with 1S65 (13:20 BHM-GLC) approaching Lancaster	

13:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Headway clash with 1S70 (14:20 BHM-EDB) between Norton Bridge and Crewe	
Clash with 1V87 (14:30 MAN-MFH) at Crewe	
Identical path to 1F46 (14:01 BHM-LIV) between Hartford and Weaver Jn	
Clash with 1H89 (13:31 BNG-MAN) at Warrington Bank Quay	
Runs through 2N80 (14:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N28 (14:33 HAZ-PRE) at Euxton Jn	
Clash with 2N03 (15:17 OMS-PRE) at Ribble Jn	
Departure of 2Y61 (16:03 LAN-LDS) from Platform 1 just before 13:33 arrives. Breaks margin allowed in TPR and clashes with potential ECS path.	
Headway clash and platform re-occupation issue with 1S65 (13:20 BHM-GLC) approaching Lancaster	

14:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Runs through 4H17 (Wembley - Trafford Park) between Brinklow and Attleborough	
Same path as 1S77 (15:20 BHM-GLC) Stafford North Jn to Crewe	
Clash with 1V89 (15:30 MAN-PMD) at Crewe	
Runs through 1F48 (15:01 BHM-LIV) between Winsford and Hartford	
Clash with 1D30 (15:50 MAN-LLD) at Winwick Jn	
Clash with 2F53 (15:37 BPN-LPY) at Springs Branch Jn	
Runs through 2N84 (15:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Headway clash with 6S96 (ThO) Sinfin - Grangemouth	

15:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Same path as 1Q27 (NMT) between Euston and Milton Keynes Central	
Headway clash with 1S80 (14:43 EUS-EDB) between Norton Bridge and Crewe	
Clash with 1V91 (16:30 MAN-MFH) at Crewe	
Runs through 1F50 (16:01 BHM-LIV) at Hartford	
Clash with 2F59 (16:35 BPN-LPY) at Springs Branch Jn	
Runs through 2N88 (16:36 LPY-BPN) between Springs Branch Jn and Balshaw Lane Jn	
Clash with 2N20 (16:30 HAZ-PRE) at Euxton Jn	
Platform re-occupation issue with 1S80 (14:43 EUS-EDB) at Lancaster	

16:33 Euston - Preston: Existing path	
17:33 Euston - Liverpool: Existing path	
18:34 Euston - Liverpool: Existing path	

19:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Same path as 1S55 (19:23 Willesden PRDC - Shieldmuir Mail Terminal) between Watford Junction and Tring	
Headway clash at Colwich with 2U91 (18:29 EUS-CRE)	
Clash at Crewe with 1V97 (20:30 MAN-CDF)	
Same path as 1P05 (FO)(18:46 EUS-PRE) between Crewe and Preston	
Dependant on 1S06 (19:30 EUS-GLC) being accelerated to avoid platform reoccupation issue at WBQ	
Clash with 1H96 (19:42 LLD-MAN) at Warrington Bank Quay	
Clash with 2F59 (20:37 BPN-LIV) at Springs Branch Jn	

20:33 Euston - Lancaster	T.Load: Cl.221
Issues	**Severity**
Same path as 5D16 (Euston - Barton-under-Needwood) between Euston and Stafford	
Same path as 1P07 (20:30 EUS-PRE) between Crewe and Preston	
Headway clash with 2N84 (21:42 LIV-BPN) at Balshaw Lane Jn	
NOTE: Duplicates calls in very similar (existing) 20:30 Euston - Preston	

xx.36 from London Euston (Class 390)

Conflicts identified for xx:36 path from Euston to Preston calling at Milton Keynes Central, Nuneaton, Crewe, Warrington Bank Quay, Wigan North Western and Preston using Class 390 Pendolino timings

NOTE: xx:36 is overtaken by xx:40 EUS-MAN at MKC, hence journey time of xx:36 is compromised. Assumes xx:36 calls at MKC, NUN, CRE, WBQ, WGN and PRE

06:33 Euston – Preston	**T.Load: Cl.390**
Issues	**Severity**
Headway clash with 4G05 (Willesden - Washwood Heath) at Brinklow	
Runs through 1H17 (07:31 BHM-MAN) at Stafford North Jn	
Runs through 4S43 (Daventry - Mossend) between Hartford and Weaver Jn	
Headway clash with 4S52 (Crewe Basford Hall - Coatbridge) between Springs Branch Jn and Preston	
Clash with 2J44 (08:20 BPN - MCV) at Euxton Jn	
NOTE: Assumed to run at 06:33 (vice 06:36) and pick up standard path at Watford Jn. This is due to current '06:40' EUS-MAN running at 06:36 to allow extra call at WFJ	

07:36 Euston – Preston	**T.Load: Cl.390**
Issues	**Severity**
Headway clash with 1H62 (07:35 EUS-MAN) between Euston and Milton Keynes Central. To resolve would need MKC stop removed from 1H62 so it runs as standard pattern at 07:40 from Euston	
Runs through 4M45 (Felixstowe - Ditton)/4M21 (Felixstowe - Hams Hall) at Brinklow	
Runs through 1F00 (06:40 Willesden PRDC - Warrington Mail Terminal) at Hartford Jn	
Runs through 6S94 (WO)(Dollands Moor - Irvine) between Weaver Jn and Acton Grange Jn	
Clash with 2J46 (09:20 BPN - MCV) at Euxton Jn	

08:36 Euston – Preston	**T.Load: Cl.390**
Issues	**Severity**
Headway conflict with 4H22 (Wembley - Trafford Park) at Brinklow	
Runs through 4S28 (Crewe Basford Hall - Hunterston) at Warrington Bank Quay	
Clash with 2J48 (10:20 BPN - MCV) at Euxton Jn	

09:36 Euston – Preston	**T.Load: Cl.390**
Issues	**Severity**
Runs through 4F59 (Ironbridge PS - Arpley Sidings) between Winsford and Hartford Jn	
Clash with 2J40 (11:20 BPN - MCV) at Euxton Jn	

10:36 Euston – Preston	T.Load: Cl.390
Issues	**Severity**
Runs through 4M50 (Southampton - Crewe Basford Hall) between Colwich and Milford & Brocton	
Headway clash with 1Q23 (WO) NMT path at Winsford	
Runs through 4S42 (Rugeley B - Hunterston) between Weaver Jn and Acton Grange Jn	
Clash with 2J42 (12:20 BPN - MCV) at Euxton Jn	

11:36 Euston - Preston	T.Load: Cl.390
Issues	**Severity**
Runs through 4S44 (Daventry - Mossend) at Brinklow	
Runs through 4S05 (Rugeley B - Barassie) and 6C40 (Guide Bridge - Shap Summit) at Weaver Jn	
Headway clash with 4S04 (Arpley Sidings - Falkland Sidings) at Wigan and runs through 4S04 between Euxton Jn and Farington Jn	
Clash with 2J44 (13:20 BPN - MCV) at Euxton Jn	

12:36 Euston - Preston	T.Load: Cl.390
Issues	**Severity**
Runs through 4M94 (Felixstowe - Lawley St) at Brinklow	
Runs through 4S44 (Daventry - Mossend) between Weaver Jn and Acton Grange Jn	
Clash with 2J46 (14:20 BPN - MCV) at Euxton Jn	

13:36 Euston - Preston	T.Load: Cl.390
Issues	**Severity**
Runs through 4M81 (Felixstowe - Crewe Basford Hall) at Brinklow	
Runs through 4F61 (TThO)(Ironbridge - Tuebrook Sidings) at Warrington Bank Quay	
Runs through 4C03 (TThO) (Washwood Heath - Carlisle NY) between Golborne Jn and Springs Branch	
Clash with 2J48 (15:20 BPN - MCV) at Euxton Jn	
Clash with 2J04 (16:00 PRE - OMS) at Ribble Jn	

14:36 Euston - Preston	T.Load: Cl.390
Issues	**Severity**
Runs through 6F11(Bletchley - Arpley sidings) QJ-strategic path at Brinklow	
Runs through 4S96 (Ironbridge - Falkland Sidings) between Hartford and Acton Bridge	
Headway clash with 4S54 (Crewe Basford Hall - Coatbridge) between Acton Grange Jn and Warrington Bank Quay	
Clash with 2J40 (16:20 BPN - MCV) at Euxton Jn	

15:36 Euston - Preston	T.Load: Cl.390
Issues	**Severity**
Headway clash with 1Q27 (NMT) between Watford Jn and Rugby	
Runs through 6K50 (Toton - Crewe Basford Hall at Milford & Brocton)	
Runs through 6F11(Bletchley - Arpley sidings) QJ-strategic path between Weaver Jn and Acton Grange Jn	

16:36 Euston – Preston	T.Load: Cl.390
Issues	**Severity**
Runs through 4M32 (Dollands Moor - Trafford Park) between Brinklow and Attleborough	
Headway clash with 1P21 (16:33 EUS-PRE) between Crewe and Preston. If 16:36 is timed later to run behind 1P21 the following conflicts occur:	
Headway clash with 1S04 (Warrington Mail terminal - Shieldmuir Mail Terminal) at Winwick Jn	
Runs through 2N74 (18:05 LIV-PRE) between Wigan North Western and Balshaw Lane Jn	

17:36 Euston – Preston	T.Load: Cl.390
Issues	**Severity**
Runs through 0K58(FO) (Rugby - Crewe) between Rugby and Attleborough	
Headway clash with 1S96 (16:22 Willesden Mail Terminal - Shieldmuir) between Acton Bridge and Warrington	
Headway clash with 2N76 (19:23 LIV-BPN) at Wigan North Western	
Clash with 2J46 (19:20 BPN - MCV) at Euxton Jn	

18:36 Euston – Preston	T.Load: Cl.390
Issues	**Severity**
Headway clash with 1F25 (18:34 EUS-LIV) between Euston and Milton Keynes Central	
Runs through 4S47 (Daventry - Coatbridge) between Brinklow and Attleborough	
Runs through 6M88(TThO) (Middleton Towers - Crewe Basford Hall) between Nuneaton and Amington Jn	
Same path as 2U99 (17:24 EUS-CRE) between Rugeley North and Colwich	
Runs through 4M56 (Thames Haven - Ditton) between Colwich and Milford & Brocton	
Runs through 6F08(ThO) (Sinfin Sidings - Arpley Sidings) between Acton Bridge and Weaver Jn	
Runs through 4F18(MTFO) between Weaver Jn and Acton Grange Jn	
Headway clash 6S73 (Arpley Sidings - Mossend) at Wigan North Western	
Clash with 2J48 (20:20 BPN - MCV) at Euxton Jn	

19:36 Euston – Preston	T.Load: Cl.390
Issues	**Severity**
Runs through 1S55 (19:23 Willesden PRDC - Shieldmuir Mail Terminal) between Bourne End Junction and Tring	
Runs through 1Q28(TO) (NMT) between Brinklow and Attleborough	
Identical path to 1H74 (19:40 EUS-MAN) between Colwich and Stafford	
Clash with 1M69 (19:00 BRI-MAN) at Norton Bridge	
Runs through 4S59 (Crewe Basford Hall - Coatbridge) at Winsford and headway clash Warrington to Euxton Jn	
Headway clash with 6X77 (Wembley - Mossend) at Acton Bridge	
Clash with 2J40 (21:20 BPN - MCV) at Euxton Jn	

20:36 Euston - Preston	T.Load: Cl.390
Issues	**Severity**
Clash with 6G15(TO) (Wembley - Bescot) at Brinklow	
Headway clash with 4M98 (Southampton - Garston) at Colwich	
Headway clash with 1P99 (21:20 BHM-PRE) between Norton Bridge and Preston. Assuming 20:36 is pathed to run behind 1P99 remaining conflicts are:	
No platform at Crewe due to 1P99, 1W90 (19:34 CDF-HHD) and 1L99 (21:34 LIV-BHM)	
Clash with 1C59 (22:00 MIA-BIF) at Wigan North Western and headway clash to Balshaw Lane	
Clash with 2F63(FO) (22:14 BPN-LIV) at Balshaw Lane Jn	

xx.58 arrival at London Euston (Class 390)

Conflicts identified for xx:58 arrival at Euston. Assumes this is existing xx:40 Glasgow – Euston accelerated south of Carnforth to only call at Preston and uses Class 390 Pendolino timings.

05:40 Glasgow - Euston (accelerated; 07:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Clash with 2J42 (07:18 BPN-MCV) at Euxton Jn	
Clash at Golborne Jn with TPE's aspired 1S38 07:25 MIA-EDB)	
Runs through 6K89 (Ellesmere Port - Crewe Basford Hall) between Acton Grange Jn and Weaver Jn	
Runs through 6G51 (Arpley Sidings - Donnington RFT) between Hartford and Winsford	
Runs through 1L75 (07:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L75 on SL however this creates the conflicts in italics below)	
1L75 runs through 4L97 (Trafford Park - Felixswtowe) at Madeley	
1L75 clash with 1M18 (05:15 SOU-MAN) at Norton Bridge	
1L75 path later through Wolverhampton and into Birmingham New Street	
Clash with 1M18 (05:15 SOU-MAN) at Norton Bridge	
Same path as 1U22 07:55 CRE-EUS) between Norton Bridge and Colwich	
Clash with 1W05 (08:49 EUS-BHM) at Milton Keynes Central	

06:30 Glasgow - Euston (accelerated; 08:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Clash with 2J44 (08:20 BPN-MCV) at Euxton Jn	
Headway clash with TPE's aspired 1M90 (06:15 EDB-MIA) at Golborne Jn	
Runs through 4M34 (Coatbridge - Daventry) between Acton Grange Jn and Weaver Jn	
Runs through 6M69 (Ravenstruther - Ironbridge PS)/4V20 (Fiddlers Ferry - Stoke Gifford) between Hartford and Winsford	
Runs through 1L79 (08:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L79 on SL however this creates the conflicts in italics below)	
1L79 runs through 0A99 (Longsight - Rugby) between Basford Hall and Madeley	
1L79 runs through 6B11 (Arpley Sidings - Bletchley RMC) QJ path at Norton Bridge	
1L79 clash with 1M22 (06:15 SOU-MAN) at Norton Bridge	
1L79 path 3 mins later through Wolverhampton and into Birmingham New Street	
Clash with 1M22 (06:15 SOU-MAN) at Norton Bridge	
Clash with 1W07 (09:49 EUS-BHM) at Milton Keynes Central	
Headway clash with following 1A16 (08:55 MAN-EUS) south of Watford Jn. Will require 1A16 journey time to be increased by 2 mins	

07:37 Glasgow - Euston (accelerated; 09:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Clash with 2J46 (09:20 BPN-MCV) at Euxton Jn	
Headway clash with TPE's aspired 1M91 (07:10 GLC-MIA) at Golborne Jn	
Runs through 4M27 (Coatbridge - Crewe Basford Hall) between Hartford and Winsford	
Runs through 1L83 (09:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L83 on SL however this creates the conflicts in italics below)	
1L83 runs through 4M34 (Coatbridge - Daventry) between Basford Hall and Madeley	
1L83 runs through 6M69 (Ravenstruther - Ironbridge PS) between Norton Bridge and Stafford	
1L83 clash with 1M26 (06:30 BMH-MAN) at Norton Bridge	
1L83 same path as 1Q25 (ThO) NMT path between Norton Bridge and Wolverhampton	
1L83 path 3 mins later through Wolverhampton and into Birmingham New Street	
Clash with 1M26 (06:30 BMH-MAN) at Norton Bridge	
Same path as 4L75 (Crewe Basford Hall - Felixstowe) between Whitehouse Jn and Colwich	
Clash with 1W09 (10:49 EUS-BHM) at Milton Keynes Central	
Headway clash with following 1A21 (09:55 MAN-EUS) south of Watford Jn. Will require 1A21 journey time to be increased by 1 min	

08:40 Glasgow - Euston (accelerated; 10:39 Lancaster - Euston to utilise former path of Glasgow train)	**T.Load: Cl.390**
Issues	**Severity**
Runs through 4M26 (MO)(Mossend - Bescot) between Lancaster and Preston	
Clash with 2J48 (10:20 BPN-MCV) at Euxton Jn	
Clash with 1S10 (11:04 Warrington Mail Terminal - Shieldmuir Mail Terminal) at Winwick Jn	
Runs through 1M21 (06:34 Shieldmuir Mail Terminal - Willesden PRDC) between Acton Grange Jn and Weaver Jn	
Runs through 0K83 (Garston - Crewe Basford Hall) at Hartford Jn	
Runs through 1L87 (10:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L87 on SL however this creates the conflicts in italics below)	
1L87 runs through 4L72 (Crewe Basford Hall - Tilbury) between Norton Bridge and Stafford	
1L87 path 3 mins later through Wolverhampton and into Birmingham New Street	
Same path as 1A76 (FO) (10:36 PRE-EUS) between Rugby and Euston	
Clash with 1W11 (11:49 EUS-BHM) at Milton Keynes Central	
Headway clash with following 1A26 (10:55 MAN-EUS) south of Watford Jn. Will require 1A26 journey time to be increased by 1 min	

09:40 Glasgow - Euston (accelerated; 11:39 Lancaster - Euston to utilise former path of Glasgow train)	**T.Load: Cl.390**
Issues	**Severity**
Clash with 2J40 (11:20 BPN-MCV) at Euxton Jn	
Runs through 1L91 (11:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L91 on SL however this creates the conflicts in italics below)	
1L91 runs through 4M26 (MO) (Mossend - Bescot) at Madeley	
1L91 clash with 1M34 (08:45 BMH-MAN) at Norton Bridge	
1L91 path 2.5 mins later through Wolverhampton and into Birmingham New Street	
Clash with 1M34 (08:45 BMH-MAN) at Norton Bridge	
Clash with 1W13 (12:49 EUS-BHM) at Milton Keynes Central	
Note: This path is already accelerated in High Summer for Dec'12 TT, assumes timings as per summer schedule	
Note: WTT path has issues at Norton Bridge where 1L91 leaves FL only 2.5min before GLC-EUS passes. If 1L91 went SL all the way from Crewe this would cause additional freight conflicts as outlined above. Also clashes with 1M34 at Norton Bridge. Additional issues at MK with 1W13: WTT as it stands is not rules compliant.	

10:40 Glasgow - Euston (accelerated; 12:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Clash with 2J42 (12:20 BPN-MCV) at Euxton Jn	
Headway clash with TPE's aspired 1M94 (10:12 EDB-MIA) at Golborne Jn	
Clash with 6F47 (Liverpool Bulk Terminal - Fiddlers Ferry PS) at Winwick Jn	
Runs through 6H11 (Shap Summit - Hope Street Peakstone) between Warrington Bank Quay and Acton Grange Jn	
Runs through 0F61 (TO) (Arpley Sidings - Folly Lane) between Weaver Jn and Acton Bridge	
Runs through 1L95 (12:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L93 on SL however this creates the conflicts in italics below)	
1L95 clash with 1M38 (09:45 BMH-MAN) at Norton Bridge	
1L95 path 2.5 mins later through Wolverhampton and into Birmingham New Street	
Clash with 1M38 (09:45 BMH-MAN) at Norton Bridge	
Same path as 4L47 (TWFO)(Crewe Basford Hall - Thames Haven between Whitehouse Jn and Colwich	
Clash with 1W15 (13:49 EUS-BHM) at Milton Keynes Central	
Headway clash with following 1A36 (12:55 MAN-EUS) south of Watford Jn. Will require 1A36 journey time to be increased by 1 min	

11:40 Glasgow - Euston (accelerated; 13:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Clash with 2J44 (13:20 BPN-MCV) at Euxton Jn	
Headway clash with TPE's aspired 11:09 GLC-MIA at Golborne Jn	
Clash at Golborne Jn and headway clash Golborne Jn to Winwick Jn with 4M44 (Mossend - Daventry)	
Headway clash Winwick Jn to Warrington Bank Quay with 5D39 (LIV-CTR empty stock)	
Runs through 1L99 (13:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L99 on SL however this creates the conflicts in italics below)	
1L99 clash with 1M42 (10:45 BMH-MAN) at Norton Bridge	
1L99 path 0.5 mins later through Wolverhampton and into Birmingham New Street	
Clash with 1M42 (10:45 BMH-MAN) at Norton Bridge	
Clash with 1W17 (14:49 EUS-BHM) at Milton Keynes Central	
Headway clash with following 1A41 (13:55 MAN-EUS) south of Watford Jn. Will require 1A41 journey time to be increased by 1 min	

12:40 Glasgow - Euston (accelerated; 14:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Clash with 2J46 (14:20 BPN-MCV) at Euxton Jn	
Runs through 6M11 (Hunterston - Fiddlers Ferry) at Wigan North Western	
Clash with 1Q48 (ThO) NMT path at Winwick Jn	
Runs through 6K17 (Ashton-in-Makerfield - Crewe Basford Hall)/6U68 (Carlisle NY - Crewe Basford Hall) between Acton Grange Jn and Weaver Jn	
Runs through 4M83 (Coatbridge - Crewe Basford Hall) between Acton Grange Jn and Weaver Jn	
Runs through 4M64 (Mossend - Daventry) between Hartford and Winsford	
Runs through 1L73 (14:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L73 on SL however this creates the conflicts in italics below)	
1L73 runs through 4M44 (Mossend - Daventry) at Crewe Basford Hall Jn	
1L73 clash with 1M46 (11:45 BMH-MAN) at Norton Bridge	
1L73 path 2.5 mins later through Wolverhampton and into Birmingham New Street	
Clash with 1M46 (11:45 BMH-MAN) at Norton Bridge	
Headway clash with following 1A46 (14:55 MAN-EUS) south of Watford Jn. Will require 1A46 journey time to be increased by 1 min	

13:40 Glasgow - Euston (accelerated; 15:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Clash with 2J48 (15:20 BPN-MCV) at Euxton Jn	
Runs through 1L77 (15:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L77 on SL however this creates the conflicts in italics below)	
1L77 clash with 1M50 (12:45 BMH-MAN) at Norton Bridge	
1L77 path 3 mins later through Wolverhampton and into Birmingham New Street	

14:40 Glasgow - Euston (accelerated; 16:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Clash with 2J40 (16:20 BPN-MCV) at Euxton Jn	
Runs through TPE's aspired 14:18 EDB-MIA at Golborne Jn	
Runs through 6K05/6X05 (Carlisle - Crewe Basford Hall) between Acton Grange Jn and Weaver Jn	
Headway clash with 1A91 (17:00 Warrington Mail Terminal - Willesden PRDC) between Hartford Jn and Winsford	
Runs through 1L81 (16:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L81 on SL however this creates the conflicts in italics below)	
1L81 runs through 6M04 (Portbury - Rugeley B) between Madeley and Norton Bridge	
1L81 clash with 1M54 (13:45 BMH-MAN) at Norton Bridge	
Clash with 1M54 (13:45 BMH-MAN) at Norton Bridge	
Headway clash in between the paths of 1A55 (16:48 LIV-EUS) and 1A56 (16:55) MAN-EUS between Milton Keynes and Watford Jn. Unless Milton Keynes call is removed from 1A55 there is no standard pattern path for accelerated 14:40 GLC-EUS	

15:40 Glasgow - Euston (accelerated; 17:39 Lancaster - Euston to utilise former path of Glasgow train)	T.Load: Cl.390
Issues	**Severity**
Runs through 1L85 (17:34 LIV-BHM) between Crewe and Stafford (solution is to run 1L81 on SL however this creates the conflicts in italics below)	
1L85 runs through 4G85 (Crewe Basford Hall - Lawley St FLT) between Basford Hall Jn and Madeley	
1L85 clash with 1M58 (14:45 BMH-MAN) at Norton Bridge	
1L85 path 2.5 mins later through Wolverhampton and into Birmingham New Street	
Clash with 1M58 (14:45 BMH-MAN) at Norton Bridge	
Runs through 6O38 (Halewood - Southampton) between Whitehouse Jn and Colwich	

Assumed that xx:08 arrival at Euston currently occupied by Glasgow – Euston path will be filled by additional Lancaster Euston service departing Lancaster at xx:39 as per the existing path of the Up Glasgow service.

An exercise was carried out to assess the impact of operating these paths using Class 221 Super Voyager timings in a few sample hours. This proved to be workable, as the time differential can be overcome by reducing pathing time and reducing the dwell times at Wigan North Western and Warrington Bank Quay to 1½ minutes (which is permitted for this train type). The main obstacle which was identified related to platform re-occupation at Preston behind the xx.40 Glasgow – Euston, but this would not be an issue if the path started at Preston or Blackpool.

xx.11 arrival at London Euston (Class 390)

Conflicts identified for xx:11 arrival at Euston. Assumes this utilises the same stopping pattern as used to assess the xx:36 Euston - Preston path (in reverse) and based on Class 390 Pendolino timings.

07:26 Preston – Euston	T.Load: Cl.390
Issues	**Severity**
Runs through 4K44 (Garston - Crewe Basford Hall) at Winsford	
Headway clash with 1L75 (07:34 LIV-BHM) at Weaver Jn	
Headway clash with 1B29 (08:50 BHM - EUS) Bletchley to Euston, results in 1B29 running 2 min later BLY-EUS	

08:26 Preston – Euston	T.Load: Cl.390
Issues	**Severity**
Clash with 2H06 (09:23 PRE-HAZ) at Euxton Jn	
Headway clash with 1L79 (08:34 LIV-BHM) at Weaver Jn	
Headway clash with 0K41 (Garston - Crewe) at Winsford	
Clash with 1V75 (08:30 MAN-MFH) at Crewe	
Headway clash with 1B28 (09:50 BHM - EUS) Bletchley to Euston, results in 1B28 running 2 min later BLY-EUS	

09:26 Preston – Euston	T.Load: Cl.390
Issues	**Severity**
Clash with 2H08 (09:23 PRE-HAZ) at Euxton Jn	
Headway clash with 6E37 (Preston Docks - Lindsey Oil Refinery) between Balshaw Lane and Winwick Jn	
Headway clash with 1L83 (09:34 LIV-BHM) at Weaver Jn	
Headway clash with 1B34 (10:50 BHM - EUS) Bletchley to Euston, results in 1B40 running 2 min later BLY-EUS	

10:26 Preston – Euston	T.Load: Cl.390
Issues	**Severity**
Clash with 2H00 (10:23 PRE-HAZ) at Euxton Jn	
Runs through 6O60 (Mossend - Dollands Moor)/6K48 (Arpley Sidings - Crewe TMD) at Hartford	
Headway clash with 1L87 (10:34 LIV-BHM) at Weaver Jn	
Headway clash with 0F82 (Seaforth - Crewe Basford Hall) at Winsford	
Same path as 1A76 (FO)(10:36 PRE-EUS) between Stafford and Nuneaton	
Headway clash with 1B40 (11:50 BHM - EUS) Bletchley to Euston, results in 1B40 running 2 min later BLY-EUS	

11:26 Preston - Euston	T.Load: Cl.390
Issues	**Severity**
Clash with 2H02 (11:23 PRE-HAZ) at Euxton Jn	
Runs through 6M87 (Chalmerston - Fiddlers Ferry) between Balshaw Lane Jn and Wigan North Western	
Headway clash with 1L91 (11:34 LIV-BHM) at Weaver Jn	
Headway clash with 6O42 (Halewood Jaguar - Southampton) at Winsford	
Headway clash with 1B46 (12:50 BHM - EUS) Bletchley to Euston, results in 1B46 running 2 min later BLY-EUS	

12:26 Preston - Euston	T.Load: Cl.390
Issues	**Severity**
Clash with 2H04 (12:23 PRE-HAZ) at Euxton Jn	
Headway clash with 1B52 (13:50 BHM - EUS) Bletchley to Euston, results in 1B52 running 1 min later BLY-EUS	

13:26 Preston - Euston	T.Load: Cl.390
Issues	**Severity**
Clash with 2H06 (13:23 PRE-HAZ) at Euxton Jn	
Headway clash with 4H35 (Folly Lane - Northenden) between Weaver Jn and Acton Bridge	
Utilises path of 1Q28 (NMT) between Crewe and Colwich	
Headway clash with 1B58 (14:50 BHM - EUS) Bletchley to Euston, results in 1B58 running 1 min later BLY-EUS	

14:26 Preston - Euston	T.Load: Cl.390
Issues	**Severity**
Clash with 2H08 (14:23 PRE-HAZ) at Euxton Jn	
Headway clash with 1L73 (14:34 LIV-BHM) at Weaver Jn	
Headway clash with 4L92 (Ditton - Felixstowe) at Winsford	
Same path as 5A83 (ThFO) (Longsight - Euston) between Crewe and Colwich	
Same path as 5B05 (FO) (Wolverhampton CS - Euston) between Rugby and Milton Keynes	
Headway clash with 1B64 (15:50 BHM - EUS) Bletchley to Euston, results in 1B64 running 2 min later BLY-EUS	

TransPennine Express Manchester Airport – Scotland Services

Conflicts identified as affecting the proposed additional TPE Manchester Airport – Scotland paths.

05:00 Manchester Piccadilly - Glasgow Central	T.Load: Cl.185
Issues	**Severity**
Clash with 2C00 (05:46 Lancaster – Windermere) - to run three minutes later than current	
Clash with 2F17 (07:40 Coatbridge Central - Milngavie) - retimed in Rutherglen area	
8 other conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

11:00 Manchester Airport - Glasgow Central	T.Load: Cl.350 (@110mph)
Issues	**Severity**
Clash with 2H84 (10:19 Leeds - Heysham) - retimed 7 mins earlier Lancaster to Heysham	
Clash with 4S43 (Daventry - Mossend) – retimed 57 minutes earlier from Carlisle NY (dwell reduced), arrives Mossend as current	
14 other conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

15:00 Manchester Airport - Glasgow Central	T.Load: Cl.185
Issues	**Severity**
Clash with 2F55 (16:38 Wigan North Western - Liverpool Lime Street) - suggested this be retimed 1 minute earlier throughout, however Northern Rail concerned this breaks standard pattern	
6 other conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

20:00 Manchester Airport – Edinburgh	T.Load: Cl.350 (@110mph)
Issues	**Severity**
7 conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

04:22 Glasgow Central - Manchester Airport	T.Load: Cl.185
Issues	**Severity**
Clash with 4M34 (Coatbridge - Daventry) - departure time from Glasgow for the TPE service would be later if it weren't for 4M34	
Clash with 6C25 (Carlisle NY - Shap Summit) - retimed 10 mins earlier from origin	
3 other conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

09:09 Glasgow Central - Manchester Airport	T.Load: Cl.185
Issues	**Severity**
Clash with 2S30 (08:42 Milngavie - Lanark) - retimed between Rutherglen and Motherwell	
Clash with 2F21 (08:50 Motherwell - Milngavie) - retimed in Rutherglen area	
Clash with 2B50 (08:25 Dalmuir - Lanark) - retimed to run 1 min later than current between Law Jn and Lanark	
Clash with 4M64 (Mossend - Daventry) - advised this doesn't run and can be made into a strategic path, identification of a suitable alternative path has been found to be difficult	
Clash with 4M44 (Mossend - Daventry) - retimed between Lanark and Carlisle however retiming is **not** compatible with 09:23 GLC-EUS	
Clash with 1M90 (09:23 Glasgow Central - Euston) - all retimings of other trains have assumed this high summer only path does not run	
Clash with 6M49 (Mossend - Carlisle NY) - retimed earlier into Carlisle NY	
Clash with 6M51 (Millerhill - Carlisle NY) - alternative path very difficult to find. Possible alternatives identified but none confirmed as acceptable to date	
Clash with 2N20 (10:23 Carlisle - Newcastle) when the autumn leaf fall variant of this train runs	
Clash with 2C38 (09:07 Sellafield - Lancaster) - retimed 1 minute earlier	
Clash with 2C73 (11:22 Lancaster - Morecambe) - retimed 1 minute earlier	
15 other conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

10:12 Edinburgh - Manchester Airport	T.Load: Cl.350 (@110mph)
Issues	**Severity**
Clash with 1D53 (10:12 Edinburgh – Glasgow Central) - potentially can run at 10:18 assuming path out of Edinburgh is available	
Clash with 6S58(MO) (Lackenby - Dalzell) – run through between Slateford Jn and Midcalder Jn, no solution yet identified. (No clash Tues-Fri)	
Clash with 6M31 (Ravenstruther - Ratcliffe) - significantly retimed on-route	
Clash with 6J37 (Carlisle Yard - Chirk, via S&C) - significantly retimed on-route	
Clash with 2N21 (11:22 Newcastle - Carlisle) when the autumn leaf fall variant of this train runs	
Clash with 4M64 (Mossend - Daventry) – advised this doesn't run and can be made into a strategic path, identification of a suitable alternative path has been found to be difficult	
Clash with 1M23 (09:34 Shieldmuir Mail Terminal - Willesden PRDC) - retimed earlier into Warrington, retiming **not** compatible with summer only 09:23 GLC-EUS	
3 other conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

11:09 Glasgow Central - Manchester Airport	T.Load: Cl.185
Issues	**Severity**
Clash with 2F31 (10:53 Lanark - Milngavie) - retimed in Motherwell area	
Clash with 2B58 (10:53 Dalmuir - Lanark) - retimed 1 minute later between Law Jn and Lanark	
Clash with 1S44 (08:40 Birmingham New Street - Edinburgh - retimed to arrive Edinburgh 1 minute later	
Clash with 2H03 (12:22 Edinburgh – Helensburgh Central) - retimed later between Edinburgh and Airdrie	
Clash with 4M63 (Mossend - Hams Hall) - retimed to resolve clash but this has resulted in path of 6J37 (Carlisle Yard - Chirk, via WCML) being lost	
Clash with 1L53 (10:12 Glasgow Central - Carlisle) - retimed to arrive Carlisle 2 minutes later	
Clash with 4M64 (Mossend - Daventry) – advised this doesn't run and can be made into a strategic path, identification of a suitable alternative path has been found to be difficult	
8 other conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

14:50 Glasgow Central - Manchester Airport	T.Load: Cl.350 (@110mph)
Issues	**Severity**
Clash with 2C32 (16:20 Barrow - Lancaster) - retimed to arrive Lancaster 2 minutes later	
4 other conflicts identified with freight or network trains. All resolved without affecting times at origin/destination	

APPENDIX 2: Conflicts identified in attempting to accelerate a sample of Euston – Glasgow services.

08:30 Euston – Glasgow
Potential conflict with 2Y55 at Lancaster (dependant on platforming)
Runs through 6S94 Carnforth – Oxenholme
Runs through 6C16FV Oxenholme – Tebay
Runs through 4S33 near Beattock Summit
Runs through 4S52LA near Carstairs
Conflict with 4S12 at Ravenstruther
Conflict with 2D64LA at Motherwell
09:30 Euston - Glasgow
Runs through 1S10LB Lancaster - Morecambe South Jn
2.5 minute headway (requires 4) behind 4S28LH at Tebay
Runs through 6C16FV Tebay - Penrith
Runs through 6S94 at Carlisle
Runs through 6S50/51 Cove - Lockerbie
Runs through 0S82 Abington - Carstairs
Conflict with 2D66LA at Motherwell
11:30 Euston - Glasgow
Runs through 2C77FB at Morecambe South Jn
Runs through 4S42 Carnforth - Oxenholme
Runs through 6E58 Shap - Penrith
Runs through 6C26/28 Penrith - Carlisle
Runs through 4S61 Carlisle - Gretna
Runs through 6S94 Beattock Summit
Runs through 4S40/41 approaching Carstairs
Conflict with 2D70LA at Motherwell
Conflict with 4S18/31 Uddingston Jn - Shawfield
12:30 Euston - Glasgow
Runs through 1S70LA Lancaster - Carnforth
Tight headway behind 6C30FA approaching Carnforth Loops
Runs through 4S05LH Oxenholme - Tebay
Runs through 4S04LC Tebay - Penrith
Runs through 4S08LA/LB at Gretna Jn
Runs through 4S42 at Lockerbie
Runs through 4S60/78 at Beattock
Runs through 6S09LA Beattock - Beattock Summit
Runs through 4S61LA at Carstairs
Conflict with 2D72LA at Motherwell
15:30 Euston - Glasgow
Conflict with 2C33FD at Lancaster
Runs through 4S96LB Tebay - Penrith
Conflict with 4S93LB at Carlisle
Runs through 4S54LQ at Cove
Runs through 4S44LA Beattock - Beattock Summit
Runs through 2Y13LA Shieldmuir - Motherwell

Appendix 3 Pathing Down Services

The paths reviewed were the 1033 and 1036 from Euston on a weekday

Euston	xx.00 Euston-Manchester ICWC	
	xx.03 Euston-Birmingham ICWC	
	xx.07 Euston-Liverpool ICWC	
	xx.10 Euston-Chester ICWC	
	xx.13 Euston-Birmingham LM	
	xx.20 Euston-Manchester ICWC	
	xx.23 Euston-Wolves ICWC	
	1030 Euston – Scotland ICWC path	
	1033 Additional ICWC path	
	1036 Open Access path	
	1040 Euston – Manchester (via Crewe) ICWC path	
	1043 Euston – Birmingham New Street ICWC path	
	xx.46 Euston-Crewe LM	
	xx.49 Euston-Birmingham LM	
	NOTE: No platforming work has yet been undertaken at Euston.	
MKC	xx.58½ (xx.30 from Euston)	Non-stop Down Fast (DF)
	xx.01½ (xx.33 from Euston)	Non-stop DF
	xx.05½ (xx.36 from Euston)	Arrives platform 5
	xx.08½ (xx.40 from Euston)	Non-stop DF
	xx.10½ (xx.36 from Euston)	Departs platform 5
	xx.12½ (xx.43 from Euston)	Arrives platform 6
	(overlaps for P5 / DF are confirmed clear of each other)	
Hanslope	xx.03 (xx.30 from Euston)	
	xx.06 (xx.33 from Euston)	
	xx.12½ (xx.40 from Euston)	
	xx.16 (xx.36 from Euston)	
	xx.20 (xx.43 from Euston)	
Rugby	xx.17 (xx.30 from Euston)	
	xx.20 (xx.33 from Euston)	
	xx.26½ (xx.40 from Euston)	
	xx.30 (xx.36 from Euston)	
	xx.34 (xx.43 from Euston)	left to Coventry corridor
	xx.41 – xx.42 (xx.46 from Euston)	via Platform 2 at Rugby
Brinklow	xx.20 (xx.30 from Euston)	
	xx.23 (xx.33 from Euston)	
	xx.29½ (xx.40 from Euston)	
	xx.33 (xx.36 from Euston)	
	xx.46 (xx.46 from Euston)	

Attleborough	xx.23½ (xx.30 from Euston)	
	xx.26½ (xx.33 from Euston)	
	xx.33 (xx.40 from Euston)	
	xx.36½ (xx.36 from Euston)	
	xx.49 (xx.46 from Euston)	then Slow line
	xx.54 (xx.00 from Euston)	
Nuneaton	xx.24 (xx.30 from Euston)	
	xx.27 (xx.33 from Euston)	
	xx.33½ (xx.40 from Euston)	
	xx.38-39½ (xx.36 from Euston)	
	xx.54½ (xx.00 from Euston)	
Colwich	xx.40½ (xx.30 from Euston)	
	xx.43½ (xx.33 from Euston)	
	xx.50 (xx.40 from Euston)	
	xx.57½ (xx.36 from Euston)	
	xx.57 (Freight)	
	xx.11 (xx.00 from Euston)	right to Stoke
	xx.17 (xx.07 from Euston)	
Stafford	xx.45 (xx.30 from Euston)	
	xx.48 (xx.33 from Euston)	
	xx.50 (ICWC B'ham-Scotland)	SL-FL Stafford North
	xx.55½ (xx.40 from Euston)	
	xx.01 (XC via Stoke)	
	xx.02 (xx.36 from Euston)	
	xx.11½ (LM B'ham-Liverpool)	SL-FL Stafford North
Norton Bdge	xx.48 (xx.30 from Euston)	
	xx.51 (xx.33 from Euston)	
	xx.54 (ICWC B'ham-Scotland)	
	xx.57½ (xx.40 from Euston)	
	xx.05 (xx.36 from Euston)	
	xx.07 (XC via Stoke)	
	xx.15 (LM B'ham-Liverpool)	
Basford Hall	xx.57½ (xx.30 from Euston) DF	
	xx.00½ (xx.33 from Euston) DF	
	xx.00½ (xx.35 Chester – Euston)	US – UF, needs to run earlier, but cannot arrive earlier at London Euston
	xx.04 (ICWC B'ham-Scotland) DF	
	xx.07(xx.40 from Euston) DF	
	xx.14½ (xx.36 from Euston) DF	
	xx.27 (LM B'ham-Liverpool) DF	
Crewe	xx.59 (xx.30 from Euston)	Non stop
	xx.03 (xx.33 from Euston)	Non stop
	xx.07 – xx.10 (ICWC B'ham-Scotland)	P11
	xx.10 – xx.12½ (xx.40 from Euston) P5	
	xx.17½ - xx.20½ (xx.36 from Euston)	P6
	xx.30 – xx.32 (LM B'ham-Liverpool) P6	

Winsford	xx.03½ (xx.30 from Euston)	
	xx.07 – xx.07½ (LM B'ham-Liverpool)	SL Crewe-Winsford. Looking to amend Stops and call Penkridge vice Hartford
	xx.07½ (xx.33 from Euston)	
	xx.16 (ICWC B'ham-Scotland)	
	xx.19 (Freight)	
	xx.23½ (Freight)	
	xx.26½ (xx.36 from Euston)	
	xx.38½ (LM B'ham-Liverpool)	Swap Hartford vice Penkridge?
Weaver Jn	xx.09½ (xx.30 from Euston)	
	xx.13½ (xx.33 from Euston)	
	xx.19½ (LM B'ham-Liverpool)	Left to Liverpool. Looking to amend Stops and call Penkridge vice Hartford? Need to review what to do with Acton Bridge stop?
	xx.22½ (ICWC B'ham-Scotland)	
	xx.27½ (Freight)	
	xx.32 (Freight)	
	xx.32½ (xx.36 from Euston)	
	xx.41½ (Freight)	On at Hartford and into Arpley.
	xx.45 (LM B'ham-Liverpool)	Left to Liverpool.
	xx.50 (EN- Liverpool)	Left to Liverpool
	xx.53 (Freight)	To Folly Lane
	xx.56 or xx.00 (Freight)	Ditton / Arpley.
Warrington	xx.12½ (xx.30 from Euston)	Non stop
	xx.17½ - xx.19½ (xx.33 from Euston)	
	xx.18 - xx.19 (ATW Llandudno-Man.)	Needs to be earlier off Llandudno and pathing time added on Chat Moss?
	xx.22 (Northern WBQ- Liverpool)	Into P1 via Bi-di.
	xx.26 – xx.28 (ICWC B'ham-Scotland)	
	xx.33 (Freight)	
	xx.37 (Freight)	
	xx.36½ – xx.38½ (xx.36 from Euston)	
	xx.12½ (xx.30 from Euston)	Non stop
Wigan NW	xx.20½ (xx.30 from Euston)	Non stop
	xx.28½ - xx.30½ (xx.33 from Euston)	
	xx.30 – xx.31 (Northern Liv- Blackpool)	Needs to be reviewed.
	xx.37 – xx.39 (ICWC B'ham-Scotland)	
	xx.42½ - xx.43½ (TPE Man-Scotland)	On at Golborne Jn.
	xx.47½ (Freight)	
	xx.48 – xx.50 (xx.36 from Euston)	
	xx.51½ (Freight)	
	xx.20½ (xx.30 from Euston)	

Euxton Jn	xx.26½ (xx.30 from Euston)	
	xx.28 (TPE Man-Blackpool)	Retime to xx.30½ as needs to be 4 minute headways.
	xx.38 (xx.33 from Euston)	
	xx.39½ (Northern H.Grove-Preston)	SL from Euxton Jn. Needs to be 4 min. headway.
	xx.43½ (Northern Liv-Blackpool)	SL from Euxton Jn. Needs to be 4 min. headway.
	xx.47 (ICWC B'ham-Scotland)	
	xx.51½ (TPE Man-Scotland)	
	xx.57½ (xx.36 from Euston)	
	xx.00 (Freight)	
	xx.04 (Freight)	
	xx.09 (Northern Man-Blackpool)	SL from Euxton Jn.
Preston	xx.30½ - xx.33½ (xx.30 from Euston)P4	
	xx.34½ - xx.38½ (TPE Man-Blackpool)	P3. Left to Blackpool.
	xx.43 - xx.46 (xx.33 from Euston)	P3
	xx.51 – xx.54 (ICWC B'ham-Scotland)	P3
	xx.57 – xx.59 (TPE Man-Scotland)	P4
	xx.08 (Freight)	
	xx.13 (Freight)	
	xx.02½ - xx.05½(xx.36 from Euston)	P3. Left to Blackpool.
Lancaster	xx.46 (xx.30 from Euston)	Non stop
	xx.00 ARR. (xx.33 from Euston)	Where next? ECS or Pass. to Carnforth? Or intervention Lancaster to allow reverse facility? If ECS then 5 mins platform time to Carnforth. If Pass. then 2 mins platform time to Carnforth?
	xx.07½ (ICWC B'ham-Scotland)	
	xx.13½ - xx.14½ (TPE Man-Scotland)	
	xx.19 – xx.20 (TPE Preston-Windermere)	
	xx.20 – xx.22 (xx.36 from Euston	if open access to Lancaster for Cumbria Coast?
	xx.26½ (Freight)	
	xx.32 (Northern Lancaster-Carlisle)	Starts
	xx.39 (Freight)	
	xx.37 – xx.39 (xx.36 Return)	if open access to Lancaster for Cumbria Coast?

Carnforth	Requires further extensive work given non standard TT patterns.	

Appendix 4 Pathing Up Services

The paths reviewed were the 1407 and 1438 ex Crewe on a weekday (based on Open Access path from Leeds via Stockport)

Carnforth	Requires further extensive work given non standard TT patterns.	
Lancaster	xx.56½ - xx.58 (ICWC Scotland-B'ham)	
	xx.04½ (Freight)	
	xx.05 - xx.07 (Open Access)	
	xx.24 - xx.25 (TPE Scot - Man)	
	xx.28½ (Freight)	into UGL
	xx.36 (ICWC Glasgow-Euston)	
	xx.39 (ICWC path)	arrives from Carnforth either ECS or in service)
Preston	xx.14½ - xx.17½ (ICWC Scotland-B'ham)	
	xx.23 (Northern Preston–H.Grove)	
	xx.23½ - xx.26½ (Open Access)	
	xx.28½ (Freight)	Into Preston UGL
	xx.39½ (Freight)	
	xx.44½ - xx.46½ (TPE Scot - Man)	
	xx.50 – xx.53 (ICWC Glasgow-Euston)	
	xx.56 – xx.59 (ICWC path)	
	xx.08 – xx.10 (TPE Blackpool – Man)	
Euxton Jn	xx.22 (ICWC Scotland-B'ham)	
	xx.28 (TPE Man – Blackpool)	From Chorley to DF
	xx.30½ (Open Access)	
	xx.31½ (Northern Preston–H.Grove)	
	xx.51 (TPE Scot - Man)	
	xx.57 (ICWC Glasgow-Euston)	
	xx.03 (ICWC path)	
	xx.15 (TPE Blackpool – Man)	
Wigan NW	xx.28 – xx.29½ (ICWC Scotland-B'ham)	
	xx.36½ - 39 (Open Access)	
	xx.59½ - xx.00½ (TPE Scot - Man)	Turns left at Golborne
	xx.04½ (ICWC Glasgow-Euston)	
	xx.09 – xx.11 (ICWC path)	
	xx.16 (Freight)	SL to Balshaw Lane; GL from Wigan South
Warrington	xx.39 – xx.40½ (ICWC Scotland-B'ham)	
	xx.48 - xx.50½ (Open Access)	
	xx.12½ (ICWC Glasgow-Euston)	
	xx.20 – xx.22 (ICWC path)	
	xx.25 – xx.26 (ATW Man – Llandudno)	
Weaver Jn	xx.46½ (ICWC Scotland-B'ham)	

	xx.56 (Open Access)	
	xx.53 (Freight)	From Runcorn, towards Greenbank
	xx.59 (LM Liverpool-B'ham)	
	xx.09 (ICWC Liverpool-Euston)	
	xx.16½ (ICWC Glasgow-Euston)	
	xx.27½ (ICWC path)	
	xx.31½ (LM Liverpool-B'ham)	
Winsford	xx.51½ (ICWC Scotland-B'ham)	
	xx.01 (Open Access)	
	xx.08 – xx.08½ (LM Liverpool-B'ham)	
	xx.14 (ICWC Liverpool-Euston)	
	xx.21½ (ICWC Glasgow-Euston)	
	xx.32½ (ICWC path)	
	xx.37½ (LM Liverpool-B'ham)	
Crewe	13.58½ - 14.01½ (ICWC Scotland-B'ham)	
	14.07½ (Open Access)	
	14.19½ (ICWC Liverpool-Euston)	
	14.18½ - 14.22 (LM Liverpool-B'ham)	Arr SL currently booked dep FL Assumed SL
	14.27 (ICWC Glasgow-Euston)	Non stop
	14.27 – 14.29½ (ICWC Man-Euston)	
	14.38 (ICWC path)	Non stop
	14.44½ - 14.49 (LM Liverpool-B'ham)	FL
Norton Bdge	xx.15½ (ICWC Scotland-B'ham)	
	xx.18½ (XC Man-Bournemouth)	From Stoke
	xx.21½ (Open Access)	
	xx.29½ (ICWC Liverpool-Euston)	
	xx.38 (ICWC Glasgow-Euston)	
	xx.38 (Down XC service)	
	xx.41½ (ICWC Manchester-Euston)	
	xx.49 (ICWC path)	
	xx.56 (XC Manchester-Bristol)	
	xx.03 (LM Liverpool-B'ham)	FL
Stafford	xx.15½ (ICWC Chester-Euston)	
	xx.20½ (ICWC Scotland-B'ham)	right at TV Jn.
	xx.24 – xx.25½ (XC Man-Bournemouth)	right at TV Jn.
	xx.28½ (Open Access)	
	xx.34½ - xx.36½ (ICWC Liverpool-Euston)	P1
	xx.41 (ICWC Glasgow-Euston)	
	xx.45½ (ICWC Manchester-Euston)	
	xx.52½ (ICWC path)	
	xx.01½ - xx.03½ (XC Manchester-Bristol)	right at TV Jn.
	xx.09 – xx.10 (LM Liverpool-B'ham)	right at TV Jn.
Colwich	xx.20 (ICWC Chester-Euston)	
	xx.26 (ICWC Manchester-Euston)	From Stoke
	xx.33 (Open Access)	
	xx.35 (Down ICWC to Manchester)	

	xx.42 (ICWC Liverpool-Euston)	
	xx.45½ (ICWC Glasgow-Euston)	
	xx.50 (ICWC Manchester-Euston)	
	xx.57 (ICWC path)	
	xx.04½ (ICWC Manchester-Euston)	From Stoke
Nuneaton	xx.35½ (ICWC Chester-Euston)	
	xx.43 (ICWC Manchester-Euston)	
	xx.49 – xx.50½ (Open Access)	Calls
	xx.57½ (ICWC Liverpool-Euston)	
	xx.01 (ICWC Glasgow-Euston)	
	xx.05½ (ICWC Manchester-Euston)	
	xx.12½ (ICWC path)	
	xx.20½ (ICWC Manchester-Euston)	
Rugby	xx.43½ (ICWC Chester-Euston)	
	xx.51 (ICWC Manchester-Euston)	
	xx.53 (LM Crewe-Euston)	Arrives SL xx.50
	xx.00½ (ICWC Birmingham-Euston)	
	xx.02½ (Open Access)	Arrive P5
	xx.05½ (ICWC Liverpool-Euston)	
	xx.09 (ICWC Glasgow-Euston)	
	xx.13½ (ICWC Manchester-Euston)	
	xx.15 (Open Access)	Depart P5
	xx.20½ (ICWC path)	
	xx.22 – xx.24 (ICWC Birmingham-Euston)	
	xx.28½ (ICWC Manchester-Euston	
MKC	xx.26 (ICWC Glasgow-Euston)	Non stop
	xx.30½ (ICWC Manchester-Euston)	Non stop
	xx.33 (Open Access)	Arrives P5 (Alternative OL can be used)
	xx.36½ (ICWC path)	Non stop
	xx.38½ (Open Access)	Departs P5
	xx.41½ (ICWC Birmingham-Euston)	Non stop
Euston	xx.52 (ICWC Birmingham-Euston)	
	xx.55 (ICWC Liverpool-Euston)	
	xx.59 (ICWC Glasgow-Euston	Retimed.
	xx.01 (ICWC Manchester-Euston)	
	xx.08 (ICWC path)	
	xx.11 (Open Access)	
	xx.14 (ICWC Birmingham-Euston)	Retimed from xx.13
	xx.20 (ICWC Manchester-Euston)	
	xx.27 (LM Birmingham-Euston)	
	xx.32 (ICWC Wolves-Euston)	
	xx.36 (ICWC Chester-Euston)	
	xx.39 (ICWC Manchester-Euston)	
	xx.45 (Birmingham-Euston)	
	xx.49 (LM Crewe-Euston)	

Appendix 5 Sample Paths

Sample xx.33 Euston – Lancaster (timed as Class 390)

Location Name	Working Times		Dwell	Line		Allowances			
	Arr	Dep		Plat	Line	Eng	pth	prf	Adj
LONDON EUSTON	12.28	12.33	05:00	Platform 14	E				
CAMDEN SOUTH JN		*12/35½*	/	D Down Fast	E				
CAMDEN JN		*12/36*	/	Down Fast	FL				
WILLESDEN WEST LONDN JN		*12/39*	/	Down Fast	FL				
WEMBLEY CENTRAL		*12/40½*	/	3 Dn Fast	_				
HARROW & WEALDSTONE		*12/42½*	/	Down Fast	FL				
WATFORD JUNCTION		*12/45½*	/	6 DF	FL				
BOURNE END JN (HERTS)		*12/49½*	/	Down Fast	FL				
TRING		*12/52½*	/	Down Fast	FL				
LEDBURN JN		*12/55½*	/	Down Fast	FL				
BLETCHLEY		*13/00*	/	1 Dn DF	FL				
MILTON KEYNES CENTRAL		*13/01½*	/	6 Dn Fast	FL	1	½		
HANSLOPE JN		*13/06*	/	Down Fast	FL				
WEEDON		*13/12½*	/	Down Fast	FL	1			
HILLMORTON JN		*13/19½*	/	Down Main	FL				
RUGBY		*13/20*	/	Down Fast	FL				
RUGBY TRENT VALLEY JN		*13/20½*	/	D-FL	FL				
BRINKLOW		*13/23*	/	Down Loop	FL				
ATTLEBOROUGH JN		*13/26½*	/	Down Fast	FL				
NUNEATON		*13/27*	/	2 Dn	FL				
AMINGTON JUNCTION		*13/33*	/	Down Trent Valley	FL				
LICHFIELD NORTH JN (LL)		*13/37*	/	Down Slow	FL				
RUGELEY NORTH JN		*13/40½*	/	Down Slow	FL	1			
COLWICH		*13/43½*	/	Down Fast	FL				
STAFFORD		*13/48*	/	Down Fast	FL				
NORTON BRIDGE		*13/51*	/	Down Fast	FL				
MADELEY (STAFFS)		*13/56½*	/	Down Fast	FL	1			
CREWE BASFORD HALL JN		*14/00½*	/	D-DF Fast Down	FL		1		
CREWE		*14/03*	/	D-DFL Fast Down	FL				
CREWE COAL YARD		*14/03½*	/	D-DF Fast Down	FL				
WINSFORD		*14/07½*	/	D-DF Fast Down	FL				
HARTFORD JN		*14/10½*	/	D-DS Slow Down	FL				
ACTON BRIDGE		*14/11½*	/	D-DM Fast Down	FL	1			

WEAVER JN		*14/13½*	/	D-DM Fast Down	FL				
ACTON GRANGE JN		*14/15½*	/	D-DM Fast Down	FL				
WARRINGTON BANK QUAY	14.17½	14.19½	02:00	D-3 Fast Down	FL				
DALLAM JUNCTION		*14/20½*	/	D-DF Fast Down	FL				
WINWICK JN		*14/22½*	/	D-DM Fast Down	FL				
SPRINGS BRANCH JN		*14/27*	/	D-DF Fast Down	FL				
WIGAN SOUTH JN		*14/27½*	/	D-DM Fast Down	FL				
WIGAN NORTH WESTERN	14.28½	14.30½	02:00	D-5 Fast Down	FL				
BALSHAW LANE		*14/36*	/	D-DF Fast Down	FL	1			
EUXTON JN		*14/38*	/	D-DF Fast Down	FL	1			
PRESTON	14.43	14.46	03:00	D-3 Fast Down	–			1	
LANCASTER	15.00	15.02	02:00	D-3 Down Passenger L	–				

Sample xx.33 Euston – Lancaster (timed as Class 221T)

Location Name	Working Times		Dwell	Line		Allowances			
	Arr	Dep		Plat	Line	Eng	pth	prf	Adj
LONDON EUSTON	12.28	12.33	05:00	Platform 14	E				
CAMDEN SOUTH JN		*12/35½*	/	D Down Fast	E				
CAMDEN JN		*12/36*	/	Down Fast	FL				
WILLESDEN WEST LONDN JN		*12/39*	/	Down Fast	FL				
WEMBLEY CENTRAL		*12/40½*	/	3 Dn Fast	FL				
HARROW & WEALDSTONE		*12/42½*	/	Down Fast	FL				
WATFORD JUNCTION		*12/46*	/	6 DF	FL				
BOURNE END JN (HERTS)		*12/50*	/	Down Fast	FL				
TRING		*12/53*	/	Down Fast	FL				
LEDBURN JN		*12/56*	/	Down Fast	FL				
BLETCHLEY		*13/00½*	/	1 Dn DF	FL				
MILTON KEYNES CENTRAL		*13/02*	/	6 Dn Fast	FL	1			
HANSLOPE JN		*13/06*	/	Down Fast	FL				
WEEDON		*13/12½*	/	Down Fast	FL	1			
HILLMORTON JN		*13/20*	/	Down Main	FL				
RUGBY		*13/20½*	/	Down Fast	FL				
RUGBY TRENT VALLEY JN		*13/21*	/	D-FL	FL				
BRINKLOW		*13/23½*	/	Down Loop	FL				
ATTLEBOROUGH JN		*13/27½*	/	Down Fast	FL				
NUNEATON		*13/28*	/	2 Dn	FL				
AMINGTON JUNCTION		*13/34*	/	Down Trent Valley	FL				
LICHFIELD NORTH JN (LL)		*13/38*	/	Down Slow	FL				
RUGELEY NORTH JN		*13/42*	/	Down Slow	FL	1			
COLWICH		*13/45*	/	Down Fast	FL				
STAFFORD		*13/49½*	/	Down Fast	FL				
NORTON BRIDGE		*13/53*	/	Down Fast	FL				
MADELEY (STAFFS)		*13/59*	/	Down Fast	FL	1			
CREWE BASFORD HALL JN		*14/03*	/	D-DF Fast Down	FL		1		
CREWE		*14/05½*	/	D-DFL Fast Down	FL				
CREWE COAL YARD		*14/06*	/	D-DF Fast Down	FL				
WINSFORD		*14/10½*	/	D-DF Fast Down	FL				
HARTFORD JN		*14/13½*	/	D-DS Slow Down	FL				
ACTON BRIDGE		*14/14½*	/	D-DM Fast Down	FL	1			
WEAVER JN		*14/16½*	/	D-DM Fast Down	FL				

ACTON GRANGE JN		*14/18½*	/	D-DM Fast Down	FL				
WARRINGTON BANK QUAY	14.20	14.22	02:00	D-3 Fast Down	FL				
DALLAM JUNCTION		*14/23*	/	D-DF Fast Down	FL				
WINWICK JN		*14/25*	/	D-DM Fast Down	FL				
SPRINGS BRANCH JN		*14/29½*	/	D-DF Fast Down	FL				
WIGAN SOUTH JN		*14/30*	/	D-DM Fast Down	FL				
WIGAN NORTH WESTERN	14.31	14.33	02:00	D-5 Fast Down	FL				
BALSHAW LANE		*14/39*	/	D-DF Fast Down	FL	1			
EUXTON JN		*14/41*	/	D-DF Fast Down	FL	1			
PRESTON	14.46	14.49	03:00	D-3 Fast Down	–			1	
LANCASTER	15.04	15.06	02:00	D-3 Down Passenger L	–				

Sample xx.36 Euston – Preston (timed as Class 390)

Location Name	Working Times		Dwell	Line		Allowances			
	Arr	Dep		Plat	Line	Eng	pth	prf	Adj
LONDON EUSTON	13.31	13.36	05:00	Platform 7	X				
CAMDEN SOUTH JN		*13/38½*	/	E Down Fast	E				
CAMDEN JN		*13/39*	/	Down Fast	FL				
WILLESDEN WEST LONDN JN		*13/42*	/	Down Fast	FL				
WEMBLEY CENTRAL		*13/43½*	/	3 Dn Fast	FL				
HARROW & WEALDSTONE		*13/45½*	/	Down Fast	FL				
WATFORD JUNCTION		*13/48½*	/	6 DF	FL				
BOURNE END JN (HERTS)		*13/52½*	/	Down Fast	FL				
TRING		*13/55½*	/	Down Fast	FL				
LEDBURN JN		*13/58½*	/	Down Fast	FL				
BLETCHLEY		*14/03*	/	1 Dn DF	FL				
MILTON KEYNES CENTRAL	14.05½	14.10½	05:00	5 Down Rev Fast	FL	1			
HANSLOPE JN		*14/16*	/	Down Fast	FL				
WEEDON		*14/22½*	/	Down Fast	FL	1			
HILLMORTON JN		*14/29½*	/	Down Main	FL				
RUGBY		*14/30*	/	Down Fast	FL				
RUGBY TRENT VALLEY JN		*14/30½*	/	D-FL	FL				
BRINKLOW		*14/33*	/	Down Loop	FL				
ATTLEBOROUGH JN		*14/36½*	/	Down Fast	FL				
NUNEATON	14.38	14.39½	01:30	3 Dn	FL				
AMINGTON JUNCTION		*14/47*	/	Down Trent Valley	FL				
LICHFIELD NORTH JN (LL)		*14/51*	/	Down Fast	FL				
RUGELEY NORTH JN		*14/54½*	/	Down Fast	FL	1			
COLWICH		*14/57½*	/	Down Fast	FL				
STAFFORD		*15/02*	/	Down Fast	FL				
NORTON BRIDGE		*15/05*	/	Down Fast	FL				
MADELEY (STAFFS)		*15/10½*	/	Down Fast	FL	1			
CREWE BASFORD HALL JN		*15/14½*	/	D-DF Fast Down	FL				
CREWE	15.17½	15.20½	03:00	D-6 Slow Down	FL				
CREWE COAL YARD		*15/22½*	/	D-DF Fast Down	FL				
WINSFORD		*15/26½*	/	D-DF Fast Down	FL				
HARTFORD JN		*15/29½*	/	D-DS Slow Down	FL				
ACTON BRIDGE		*15/30½*	/	D-DM Fast Down	FL	1			
WEAVER JN		*15/32½*	/	D-DM Fast Down	FL				

ACTON GRANGE JN		*15/34½*	/	D-DM Fast Down	FL				
WARRINGTON BANK QUAY	15.36½	15.38½	02:00	D-3 Fast Down	FL				
DALLAM JUNCTION		*15/39½*	/	D-DF Fast Down	FL				
WINWICK JN		*15/41½*	/	D-DM Fast Down	FL				
SPRINGS BRANCH JN		*15/46*	/	D-DF Fast Down	FL				
WIGAN SOUTH JN		*15/46½*	/	D-DM Fast Down	FL		½		
WIGAN NORTH WESTERN	15.48	15.50	02:00	D-5 Fast Down	FL				
BALSHAW LANE		*15/55½*	/	D-DF Fast Down	FL	1			
EUXTON JN		*15/57½*	/	D-DF Fast Down	FL		1		
PRESTON	16.02½	16.05½	03:00	D-3 Fast Down	–				

Sample xx.59 arrival at Euston, based on accelerated xx:40 Glasgow - Euston (timed as Class 390)

Location Name	Working Times		Dwell	Line		Allowances			
	Arr	Dep		Plat	Line	Eng	pth	prf	Adj
GLASGOW CENTRAL	10.39	10.40	01:00	U-1 Up	A1				
GLASGOW BRIDGE STREET JN		*10/42*	/	U-1U Slow Up	1U				
EGLINTON ST JN		*10/42½*	/	U-UF Fast Up	UF				
LARKFIELD JN		*10/43½*	/	U-UF Fast Up	FL				
SHAWFIELD		*10/44½*	/	U-UF Fast Up	FL				
RUTHERGLEN EAST JN		*10/46*	/	U-UF Fast Up	–		1		
NEWTON WEST JN		*10/48½*	/	U-ML Fast Up	–				
NEWTON EAST JN		*10/49½*	/	Up-Fast Up	_	1			
UDDINGSTON JN		*10/51½*	/	U-ML Fast Up	–				
MOTHERWELL		*10/54½*	/	U-1 Fast Up	_				
SHIELDMUIR		*10/56*	/	U-2 Fast Up	_				
LAW JN		*10/58½*	/	U-ML Fast Up	–				
LANARK JN		*11/03½*	/	U-ML Fast Up	–				
CARSTAIRS		*11/05*	/	U-2 Up Slow Line	–				
CARSTAIRS SOUTH JN		*11/05½*	/	U-ML Fast Up	–				
ABINGTON		*11/13½*	/	Up Main (Dec12)	–				
BEATTOCK SUMMIT		*11/18½*	/	Up Main (Dec12)	–				
BEATTOCK		*11/23½*	/	Up Main (Dec12)	–				
LOCKERBIE		*11/30½*	/	U-2 Fast Up	_	2			
COVE SIGNAL MC862		*11/39*	/	U-KP Fast Up	–				
GRETNA JN		*11/41*	/	U-ML Fast Up	–				
CARLISLE	11.47	11.49	02:00	U-4 Fast Up	_				
PENRITH NORTH LAKES		*12/01*	/	U-1 Fast Up	_				
TEBAY		*12/13*	/	U-UM Fast Up	–				
OXENHOLME LAKE DISTRICT	12.22	12.24	02:00	U-1 Fast Up	_	1			
CARNFORTH NORTH JN		*12/33*	/	U-UM Fast Up	–				
MORECAMBE SOUTH JN		*12/35*	/	U-UM Fast Up	–				
LANCASTER		*12/36*	/	U-4 Up Passenger Loop	_				
GARSTANG & CATTERAL		*12/42*	/	U-UM	_	2			
PRESTON	12.50	12.53	03:00	U-6	FL				

EUXTON JN		*12/57*	/	U-UF Fast Up	FL				
BALSHAW LANE		*12/58*	/	U-UF Fast Up	FL		2		
WIGAN NORTH WESTERN		*13/04½*	/	U-4 Fast Up	FL		½		
WIGAN SOUTH JN		*13/05½*	/	U-UM Fast Up	FL				
SPRINGS BRANCH JN		*13/06*	/	U-UF Fast Up	FL				
WINWICK JN		*13/10½*	/	U-UM Fast Up	FL				
DALLAM JUNCTION		*13/12*	/	U-Up Main	FL				
WARRINGTON BANK QUAY		*13/12½*	/	U-2 Fast Up	FL				
ACTON GRANGE JN		*13/13½*	/	U-UM Fast Up	FL	1			
WEAVER JN		*13/16½*	/	U-UM Fast Up	FL				
ACTON BRIDGE		*13/17½*	/	U-UF Fast Up	FL				
HARTFORD JN		*13/18½*	/	U-UF Fast Up	FL				
WINSFORD		*13/21½*	/	U-UF Fast Up	FL	1			
CREWE COAL YARD		*13/26½*	/	U-UF Fast Up	FL				
CREWE		*13/27*	/	U-UFL Fast Up	FL				
CREWE BASFORD HALL JN		*13/28*	/	U-UF Fast Up	FL				
MADELEY (STAFFS)		*13/31½*	/	Up Fast	FL	1			
NORTON BRIDGE		*13/38*	/	Up Fast	FL				
STAFFORD		*13/41*	/	Up Fast	FL				
COLWICH		*13/45½*	/	Up Fast	FL				
RUGELEY NORTH JN		*13/47½*	/	Up Fast	FL				
LICHFIELD NORTH JN (LL)		*13/51½*	/	Up Trent Valley Fast	FL				
AMINGTON JUNCTION		*13/55*	/	Up Trent Valley Fast	FL				
NUNEATON		*14/01*	/	4 Up	FL	1			
RUGBY TRENT VALLEY JN		*14/08½*	/	U-FL	FL				
RUGBY		*14/09*	/	4	FL				
HILLMORTON JN		*14/09½*	/	Up Main	FL				
WEEDON		*14/15½*	/	Up Fast	FL				
HANSLOPE JN		*14/22*	/	Up Fast	FL		1		
MILTON KEYNES CENTRAL		*14/26*	/	4 Up Fast	FL		1½		
BLETCHLEY		*14/29½*	/	2 Up UF	FL				
LEDBURN JN		*14/34*	/	Up Fast	FL	1			
TRING		*14/37½*	/	Up Fast	FL				
BOURNE END JN (HERTS)		*14/40½*	/	Up Fast	FL				
WATFORD JUNCTION		*14/44½*	/	7 UF	FL				
HARROW & WEALDSTONE		*14/47½*	/	4 Up Fast	FL				

WEMBLEY CENTRAL		*14/49½*	/	4 Up Fast	FL	1		1	
WILLESDEN WEST LONDN JN		*14/53*	/	Up Fast	FL				
CAMDEN JN		*14/56*	/	Up Fast	D				
CAMDEN SOUTH JN		*14/56½*	/	D Up Fast	D				
LONDON EUSTON	14.59	16.21	82:00	Platform 15					

Sample xx.08 arrival at Euston, as per current xx:40 Glasgow – Euston (timed as Class 390)

Location Name	Working Times		Dwell	Line		Allowances			
	Arr	Dep		Plat	Line	Eng	pth	prf	Adj
LANCASTER	12.37	12.39	02:00	U-4 Up Passenger Loop	_				
GARSTANG & CATTERAL		*12/47½*	/	U-UM	_	2	½		
PRESTON	12.56	12.59	03:00	U-6	FL				
EUXTON JN		*13/03*	/	U-UF Fast Up	FL				
BALSHAW LANE		*13/04*	/	U-UF Fast Up	FL				
WIGAN NORTH WESTERN	13.09	13.11	02:00	U-4 Fast Up	FL				
WIGAN SOUTH JN		*13/12*	/	U-UM Fast Up	FL				
SPRINGS BRANCH JN		*13/12½*	/	U-UF Fast Up	FL				
WINWICK JN		*13/17*	/	U-UM Fast Up	FL				
DALLAM JUNCTION		*13/18½*	/	U-Up Main	FL				
WARRINGTON BANK QUAY	13.20	13.22	02:00	U-2 Fast Up	FL				
ACTON GRANGE JN		*13/24½*	/	U-UM Fast Up	FL	1			
WEAVER JN		*13/27½*	/	U-UM Fast Up	FL				
ACTON BRIDGE		*13/28½*	/	U-UF Fast Up	FL				
HARTFORD JN		*13/29½*	/	U-UF Fast Up	FL				
WINSFORD		*13/32½*	/	U-UF Fast Up	FL	1			
CREWE COAL YARD		*13/37½*	/	U-UF Fast Up	FL				
CREWE		*13/38*	/	U-UFL Fast Up	FL				
CREWE BASFORD HALL JN		*13/39*	/	U-UF Fast Up	FL				
MADELEY (STAFFS)		*13/42½*	/	Up Fast	FL	1			
NORTON BRIDGE		*13/49*	/	Up Fast	FL		½		
STAFFORD		*13/52½*	/	Up Fast	FL				
COLWICH		*13/57*	/	Up Fast	FL				
RUGELEY NORTH JN		*13/59*	/	Up Fast	FL				
LICHFIELD NORTH JN (LL)		*14/03*	/	Up Trent Valley Fast	FL				
AMINGTON JUNCTION		*14/06½*	/	Up Trent Valley Fast	FL				
NUNEATON		*14/12½*	/	4 Up	FL	1			
RUGBY TRENT VALLEY JN		*14/20*	/	U-FL	FL				
RUGBY		*14/20½*	/	4	FL				
HILLMORTON JN		*14/21*	/	Up Main	FL				
WEEDON		*14/27*	/	Up Fast	FL				
HANSLOPE JN		*14/33½*	/	Up Fast	FL				

MILTON KEYNES CENTRAL		*14/36½*	/	4 Up Fast	FL				
BLETCHLEY		*14/38½*	/	2 Up UF	FL				
LEDBURN JN		*14/43*	/	Up Fast	FL	1			
TRING		*14/46½*	/	Up Fast	FL				
BOURNE END JN (HERTS)		*14/49½*	/	Up Fast	FL				
WATFORD JUNCTION		*14/53½*	/	7 UF	FL				
HARROW & WEALDSTONE		*14/56½*	/	4 Up Fast	FL				
WEMBLEY CENTRAL		*14/58½*	/	4 Up Fast	FL	1		1	
WILLESDEN WEST LONDN JN		*15/02*	/	Up Fast	FL				
CAMDEN JN		*15/05*	/	Up Fast	D				
CAMDEN SOUTH JN		*15/05½*	/	D Up Fast	D				
LONDON EUSTON	15.08	16.30	82:00	Platform 15					

Sample xx.09 arrival at Euston
(timed as Class 221T)

Location	Working Times		Dwell	Line		Allowances			
	Arr	Dep		Plat	Line	Eng	pth	prf	Adj
LANCSTR	12.37	12p39	02:00	U-4 Up Passenger Loop	_				
GSTANG		12/47	/	U-UM	_	2			
PRST	12a55½	12p58 ½	03:00	U-4 Fast Up	FL				
EUXTONJ		13/03	/	U-UF Fast Up	FL				
BALSHWL		13/04	/	U-UF Fast Up	FL				
WIGANNW	13.09	13p10 ½	01:30	U-4 Fast Up	FL				
WIGASJN		13/11 ½	/	U-UM Fast Up	FL				
SPRBJN		13/12	/	U-UF Fast Up	FL				
WINWCKJ		13/17	/	U-UM Fast Up	FL				
DALAMBR		13/18 ½	/	U-Up Main	FL				
WRGTNBQ	13.20	13p21 ½	01:30	U-2 Fast Up	FL				
ACGJN		13/24	/	U-UM Fast Up	FL	1			
WEAVERJ		13/27 ½	/	U-UM Fast Up	FL				
ACBG		13/28 ½	/	U-UF Fast Up	FL				
HARTFDJ		13/29 ½	/	U-UF Fast Up	FL				
WNSFD		13/32 ½	/	U-UF Fast Up	FL	1			
CREWECY		13/37 ½	/	U-UF Fast Up	FL				
CREWE		13/38	/	U-UFL Fast Up	FL				
CREWBHJ		13/39	/	U-UF Fast Up	FL				
MADELEY		13/43	/	Up Fast	FL	1			
NTNB		13/50	/	Up Fast	FL				
STAFFRD		13/53	/	Up Fast	FL				
COLWICH		13/57 ½	/	Up Fast	FL				
RUGLYNJ		13/59	/	Up Fast	FL				
LCHTNJ		14/03	/	Up Trent Valley Fast	FL				

AMNGTNJ		14/07	/	Up Trent Valley Fast	FL				
NNTN		14/13	/	4 Up	FL	1			
RUGBTVJ		14/20 ½	/	U-FL	FL				
RUGBY		14/21	/	4	FL				
HMTNJ		14/21 ½	/	Up Main	FL				
WEEDON		14/27 ½	/	Up Fast	FL				
HANSLPJ		14/34	/	Up Fast	FL				
MKNSCEN		14/37	/	4 Up Fast	FL				
BLTCHLY		14/39	/	2 Up UF	FL				
LEDBRNJ		14/43 ½	/	Up Fast	FL	1			
TRING		14/47 ½	/	Up Fast	FL				
BONENDJ		14/50 ½	/	Up Fast	FL				
WATFDJ		14/54 ½	/	7 UF	FL				
HROW		14/57 ½	/	4 Up Fast	FL				
WMBY		14/59 ½	/	4 Up Fast	FL	1		1	
WLSDWLJ		15/03	/	Up Fast	FL				
CMDNJN		15/06	/	Up Fast	A				
CMDNSTH		15/06 ½	/	A Up Fast	A				
EUSTON	15e09	16.20	71:00	Platform 3					

Sample xx.11 arrival at Euston (timed as Class 390)

Location Name	Working Times		Dwell	Line		Allowances			
	Arr	Dep		Plat	Line	Eng	pth	prf	Adj
CARNFORTH	11.57	11.58	01:00	U-2 Fast Up	_				2
CARNFORTH NORTH JN		*12/01*	/	U-G1 Goods 1	–				
MORECAMBE SOUTH JN		*12/03*	/	U-UM Fast Up	–				
LANCASTER	12.05	12.07	02:00	U-UFL Fast Up	_				
GARSTANG & CATTERAL		*12/15½*	/	U-UM	_	2			
PRESTON	12.23½	12.26½	03:00	U-4 Fast Up	FL				
EUXTON JN		*12/30½*	/	U-US Slow Up	FL				
BALSHAW LANE		*12/31½*	/	U-US Slow Up	FL				
WIGAN NORTH WESTERN	12.36½	12.39	02:30	U-4 Fast Up	FL				
WIGAN SOUTH JN		*12/40*	/	U-UM Fast Up	FL				
SPRINGS BRANCH JN		*12/40½*	/	U-UF Fast Up	FL				
WINWICK JN		*12/45*	/	U-UM Fast Up	FL				
DALLAM JUNCTION		*12/46½*	/	U-Up Main	FL				
WARRINGTON BANK QUAY	12.48	12.50½	02:30	U-2 Fast Up	FL				
ACTON GRANGE JN		*12/53*	/	U-UM Fast Up	FL	1			
WEAVER JN		*12/56*	/	U-UM Fast Up	FL				
ACTON BRIDGE		*12/57*	/	U-UF Fast Up	FL				
HARTFORD JN		*12/58*	/	U-UF Fast Up	FL				
WINSFORD		*13/01*	/	U-UF Fast Up	FL	1			
CREWE COAL YARD		*13/06*	/	U-UF Fast Up	FL		1		
CREWE		*13/07½*	/	U-UFL Fast Up	FL				
CREWE BASFORD HALL JN		*13/08½*	/	U-UF Fast Up	FL				
MADELEY (STAFFS)		*13/12*	/	Up Fast	FL	1	3		
NORTON BRIDGE		*13/21½*	/	Up Fast	FL		4		
STAFFORD		*13/28½*	/	Up Fast	FL				
COLWICH		*13/33*	/	Up Fast	FL				
RUGELEY NORTH JN		*13/35*	/	Up Fast	FL				
LICHFIELD NORTH JN (LL)		*13/39*	/	Up Trent Valley Fast	FL				
AMINGTON JUNCTION		*13/42½*	/	Up Trent Valley Fast	FL				
NUNEATON	13.49	13.50½	01:30	4 Up	FL				
NEWBOLD JUNCTION		*13/59½*	/	Up Down Trent Valley	SL	1			
RUGBY TRENT VALLEY JN		*14/01½*	/	U-DSL	UNL				

RUGBY	14.02½	14.15	12:30	5	FL				
HILLMORTON JN		*14/17*	/	U-DN	FL				
WEEDON		*14/23*	/	Up Fast	FL				
HANSLOPE JN		*14/29½*	/	Up Fast	FL				
MILTON KEYNES CENTRAL	14.33½	14.38½	05:00	4 Up Fast	FL				
BLETCHLEY		*14/41½*	/	2 Up UF	FL				
LEDBURN JN		*14/46*	/	Up Fast	FL	1			
TRING		*14/49½*	/	Up Fast	FL				
BOURNE END JN (HERTS)		*14/52½*	/	Up Fast	FL				
WATFORD JUNCTION		*14/56½*	/	7 UF	FL				
HARROW & WEALDSTONE		*14/59½*	/	Up Fast	FL				
WEMBLEY CENTRAL		*15/01½*	/	4 Up Fast	FL	1		1	
WILLESDEN WEST LONDN JN		*15/05*	/	Up Fast	FL				
CAMDEN JN		*15/08*	/	Up Fast	D				
CAMDEN SOUTH JN		*15/08½*	/	D Up Fast	D				
LONDON EUSTON	15.11	15.16	05:00	Platform 11					