

Operational Planning Programme Team - Capacity Analysis

Overnight Freight capacity on HS1

Report

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1.	<i>Engineering Access Statement</i>			
2.	<i>Timetable Planning Rules</i>			
3.				

Stakeholders

Name of stakeholder	Company / Business
<i>Chinua Labor</i>	<i>High Speed 1</i>

Abbreviations

Acronym	Meaning
ROTP	Rules of the Plan
ROTR	Rules of the Route
SRT	Sectional Running Time
SLW	Single Line Working
TID	Train Identity number



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1. INTRODUCTION & OBJECTIVES

There is an aspiration of some FOCs to operate freight services at night on HS1. At present the night time is used to maintain the line through single or double line blocks. By adding freight services onto HS1 at night this will reduce the opportunities available for possessions to be taken to carry out the maintenance. Therefore, a strategy is required to deliver robust freight paths which will bring in additional revenue whilst being able to operate freight services. It has been suggested that freight paths could be catalogued so that individual paths can then be sold off to FOCs as they require services to run and gives the best possible use of capacity. This report sets out two options for making optimum use of capacity.

2. METHODOLOGY

2.1 Assumptions

The running times for services were based initially upon the timing load used for the services which have run to date – 75C92S16. This is a Class 92 running at a maximum speed of 75 miles per hour whilst hauling 1600 tonnes of containers. However, a comparison of running times on the first two trial services against the sectional running times (SRTs) showed that the SRTs were over generous compared to the actual running times. Faster running times would be possible with trains of lighter weight.

Dagenham Junction is the location where the services join/leave HS1 from/to Ripple Lane Exchange Sidings. Ashford West Junction is where the Southeastern highspeed services join/leave HS1 to/from the Kent route

The following running times are assumed with the total value of 72 minutes in each direction:

Down					
From	To				
Ripple Lane	Dagenham Jn	<i>Stop</i>	<i>Pass</i>		4
Dagenham Jn	Wennington	<i>Pass</i>	<i>Pass</i>		4
Wennington	Ebbsfleet Int W	<i>Pass</i>	<i>Pass</i>		6
Ebbsfleet Int W	Ebbsfleet Int E	<i>Pass</i>	<i>Pass</i>		1
Ebbsfleet Int E	Southfleet Jn	<i>Pass</i>	<i>Pass</i>		2
Southfleet Jn	Nashendon	<i>Pass</i>	<i>Pass</i>		8
Nashendon	Crissmill	<i>Pass</i>	<i>Pass</i>		12
Crissmill	Lenham	<i>Pass</i>	<i>Pass</i>		6
Lenham	Ashford West	<i>Pass</i>	<i>Pass</i>		7
Ashford West	Ashford East	<i>Pass</i>	<i>Pass</i>		3
Ashford East	Westenhanger	<i>Pass</i>	<i>Pass</i>		7
Westenhanger	Dollands Moor West	<i>Pass</i>	<i>Pass</i>		2
Dollands Moor West	Dollands Moor	<i>Pass</i>	<i>Stop</i>		10

Up					
From	To				
Dollands Moor	Dollands Moor West	<i>Stop</i>	<i>Pass</i>		4
Dollands Moor West	Westenhanger	<i>Pass</i>	<i>Pass</i>		2
Westenhanger	Ashford East	<i>Pass</i>	<i>Pass</i>		7
Ashford East	Ashford West	<i>Pass</i>	<i>Pass</i>		3
Ashford West	Lenham	<i>Pass</i>	<i>Pass</i>		7
Lenham	Crissmill	<i>Pass</i>	<i>Pass</i>		6
Crissmill	Nashendon	<i>Pass</i>	<i>Pass</i>		12
Nashendon	Southfleet Jn	<i>Pass</i>	<i>Pass</i>		8
Southfleet Jn	Ebbsfleet Int E	<i>Pass</i>	<i>Pass</i>		2
Ebbsfleet Int E	Ebbsfleet Int W	<i>Pass</i>	<i>Pass</i>		1
Ebbsfleet Int W	Wennington	<i>Pass</i>	<i>Pass</i>		6
Wennington	Dagenham Jn	<i>Pass</i>	<i>Pass</i>		4
Dagenham Jn	Ripple Lane	<i>Pass</i>	<i>Stop</i>		10

A generous value is allowed for the last SRT in each direction to provide recovery from late running and makes the timetable plan for Single Line Working more robust.

Five minutes was assumed as a margin between the arrival of an inward service and the departure of an outbound service at both Ripple Lane Exchange Sidings and Dollands Moor Sidings

This study assumes that the demand for freight paths on HS1 will primarily be between Ripple Lane Exchange Sidings and Dollands Moor Sidings, with a lesser demand for paths to join/leave HS1 at York Way South Junction onto the North London Line (NLL) connection.

At Ripple Lane Exchange Sidings there is less capacity than at Dollands Moor Sidings. It was assumed that 1 of the 3 roads would be left clear for services requiring to access the Ford Motor Company sidings with one of the other roads being taken with an up and a down service.

Services in this study are flighted by pairing up a path to/from York Way with one to/from Ripple Lane where possible. Capacity restrictions at Ripple Lane Exchange Sidings restrict the number of available paths. If all services were able to be flighted the number of possible paths would then increase.

The current junction margin in the Timetable Planning Rules of three minutes was applied between any conflicting moves with other services.

Services were timed to avoid conflicting with the last Southeastern highspeed service at night and the first Southeastern highspeed service the following morning. The last Southeastern highspeed service is the down direction 00:12 St Pancras International to Ashford International which passes Dagenham Junction at 00/23 and Ashford West Junction at 00/47. The first Southeastern highspeed in the morning is the 05:13 Ashford International to St Pancras International which passes Ashford West Junction at 05/15 and Dagenham Junction at 05/39.

Crossovers on the HS1 route allow for 75mph running and therefore the attached timetable makes no additional allowances for weaves when changing running line.

The period of time at night when Single Line Working is in force was taken from Section 4 of the Engineering Access Statement for the December 20112 timetable. The Section 4 times are different for East or West of Ashford West Junction, but there is no crossover on the CTRL Main lines at this point on the route. It is assumed that trains requiring to crossover at this location will operate via Ashford International station using the CTRL Chord lines.

2.2 Building the Timetable

To begin with it was assumed that Lenham Loop would be used for allowing trains to pass. It was discovered that the characteristics of the signalling make this an undesirable method of working for normal day to day operation. Therefore the two options presented do not require the use of Lenham Loop, which would be available for use in perturbation to recover the service after an incident.

In the attached Timetable the trains are given train numbers (TIDs) in the format 4Oxx for Down trains and 4lxx for Up trains.

At the time of the study the most recent actual run of a freight train over the route was 4O22 departing from Ripple Lane at 23:36. This was taken as the starting point for building up the Down timetable. The actual recorded timings of 4O22 is shown in the attached timetable, highlighted in yellow. These recorded timings show that the SRTs used for this study give robust timings to allow for trains up to 1600 Tonnes.

There is an existing Eurotunnel catalogue path which is at North Portal at 22:47 (GMT). A path was devised to dovetail with this existing path. It was realised that such a path would need to follow Southeastern service 1J75 at Ashford West Junction and so 4I21 departing from Dollands Moor at 23:05 was taken as the starting point for building the Up timetable.

A path leaving Ripple Lane at 01:00 was added, designed to make use of the Loco and driver off the First up train. Further Up paths from Dollands Moor at 02:30 and 04:00 and a Down path at 04:30 using the resourses off the 02:30 Up train built up the initial plan. This has been developed into two conflict free timetable options. One using Singlewell Loops and the other without using any loops.

The two options presented are conflict free and compliant with Southeastern and Eurostar services shown in the December 2011 timetable.

3. PROJECT FINDINGS

3.1 Timetable Findings – Option 1

The timetable shows five trains each way between Ripple Lane and Dollands Moor, and also two further trains to/from York Way.

3.1.1 Down Trains

Train 4O22 is timed in front of the last Down passenger service (1J78). This train passes Up train 4I23 in the vicinity of Crissmill Crossover and passes 4I25 between Crissmill Crossover and Lenham Crossover.

Train 4O24 is timed to follow 1F76 (23:55 St. Pancras to Faversham) from York Way and is looped at Singlewell to allow 1F78 to overtake. Also, while 4O24 is at Singlewell trains 4I23 and 4I25 pass on the Up line. Single Line Working does not start in this area until 00:55.

Train 4O26 is the path designed to make use of resources off 4I21

Train 4O28 is looped at Singlewell to allow Up trains 4I29 and 4I31 to pass. This path has the option of coming from York Way.

Train 4O30 is the path designed to make use of resources off 4I31

Train 4O32 is flighted to follow 4O30. Both these trains pass Up train 4I33 standing in Singlewell loop

Train 4O34 runs after SLW has ended, and ahead of the first Down passenger service (9O88).

3.1.2 Up Trains

Train 4I21 is only affected by SLW between Dollands Moor and Lenham Crossovers (there being no suitable crossover at Ashford West Jn).

Train 4I23 is affected by SLW between Dollands Moor and Lenham Crossovers (there being no suitable crossover at Ashford West Jn) and also from Southfleet Junction.

Train 4I25 is flighted to follow 4I23.

Train 4I27 is affected by SLW between Dollands Moor and Ashford where this train will need to be routed via Ashford International station when required to crossover from Down to Up lines. SLW is introduced while this train is in Singlewell Loop waiting for 4O26 to pass in the Down direction. When SLW is over the Down Line this train would need to crossover at Nashenden to gain access to Singlewell Down Loop. This path has the option of going to York Way.

Train 4I29 and 4I31 pass train 4O28 standing in Singlewell Loop.

Train 4I33 is affected by SLW between Dollands Moor and Singlewell. If SLW has been over the Down Line 4I33 would be standing in the Down Loop at Singlewell and would

therefore be required to continue over the Down line to Ebbsfleet, this being the first suitable place to crossover. There is sufficient margin to do this ahead of Down train 4O34 which passes Ebbsfleet West Junction at 05/29..

3.2 Timetable Findings – Option 2

The timetable shows four trains each way between Ripple Lane and Dollands Moor, and also two additional trains to/from York Way. It was found that pathing Up and Down trains alternately between Dollands Moor and Ripple Lane there was 30 minutes leftover at the end of the night which is insufficient to create another end to end path. In order to create the same number of paths each way it was decided to add an 03:00 departure from Dollands Moor and retime subsequent Down trains later.

3.2.1 Down Trains

Train 4O22 is timed in front of the last Down passenger service (1J78). This train passes Up train 4I23 between Crissmill Crossover and Nashenden Crossover and passes 4I25 in the vicinity of Crissmill Crossover.

Train 4O26 is the path designed to make use of resources off 4I21

Train 4O28 flighted to follow 4O26.

Train 4O30 is the path retimed later to generate Up path 4I31

Train 4O32 is flighted to follow 4O30.

Train 4O34 runs after SLW has ended, and ahead of the first Down passenger service (9O88).

3.2.2 Up Trains

Train 4I21 is only affected by SLW between Dollands Moor and Lenham Crossovers (there being no suitable crossover at Ashford West Jn).

Train 4I23 is affected by SLW between Dollands Moor and Lenham Crossovers (there being no suitable crossover at Ashford West Jn) and also from Southfleet Junction.

Train 4I25 is flighted to follow 4I23.

Train 4I27 occupies the SLW after 4O28 arrives at Dollands Moor.

Train 4I29 is flighted to follow 4I27.

Train 4I31 is timed only 35 minutes behind 4I27 which creates an uneven pattern of services to Ripple Lane and could cause a capacity problem at Ripple Lane

4. CONCLUSIONS & RECOMMENDATIONS

4.1 Option 1 – Using Singlewell Loops

The timetable shows five trains each way between Ripple Lane and Dollands Moor, and also two further trains to/from York Way.

This timetable has an even spread of train paths through the night. This option is likely to be more attractive to operators and would make more efficient use of resources.

4.2 Option 2 – Without Loops

The timetable shows four trains each way between Ripple Lane and Dollands Moor, and also two additional trains to/from York Way.

The “Without Loops” timetable plan appears to be simpler in construction and operation without much loss in pathways. The disadvantages of Option 2 is that the paths in each direction are less well spread through the night. In particular arrivals at Ripple Lane at 03:37 and 04:12 may cause some congestion. There is also domestic service 6L31 (Didcot to Dagenham Dock) which is timed at Ripple Lane sidings 03:23 – 03:43. Moving train 4O30 30 minutes earlier compared to option 1 would make it more difficult for this train to make use of resources off an Up train.

4.3 Recommendation

Both timetable options do not require any alteration to passenger services.

Option 1 makes greater use of the available infrastructure to create more pathways, and is likely to be more attractive to Freight Operating Companies.