Estimated Journey Times for High Speed Services

Background

Route and Service Plans articles have been produced for each of the fourteen HS routes proposed (occasionally dealing simultaneously with two closely related routes). These articles have all recently been enhanced by including estimates of journey times for all the GC-gauge services, and in some cases for some of the associated CC services also, the method of performing these calculations having just been discovered. The present article collects together the relevant section from each Route and Service Plans article, for convenience of accessibility.

The article 'Same Speed Railways' now includes, in a new appendix B, (rather longer by itself than the original article,) a complete account of these calculations, with references to the original articles from which the information was obtained. Readers who insist on the really hard stuff should refer to that article, and its references, but most readers will (entirely reasonably) be interested only in the results.

In very general, high-level terms, the calculation is as follows:

The procedure in calculating journey times between successive station stops is to take the two pairs of values, of acceleration distance and time to line speed from the first station stop, and deceleration distance and time from line speed down to zero at the next station stop (which are, of course always the same values, for a particular line speed). Adding the two distance values and subtracting this from the distance between the stations, gives the distance travelled at line speed, which, divided by the line speed itself, gives the time taken to do that. Adding the three time values gives the total time for the journey over that particular section between stops. Accumulating these times over the complete journey, and adding a standard wait time of 3 minutes per intermediate station stop, gives the overall journey times. There are several refinements available, to take into account things such as the time penalty imposed by a diverging route junction, but that, fundamentally, is it.

The main uncertainty is of course the assumption that the entire inter-station journey, between initial acceleration and final deceleration, is performed at line speed (by which I mean the headline line speed of the entire route, 300kph – 187.5mph, or 360kph – 225mph). In practice, it is unlikely that all parts of the route will allow this speed, because of unavoidable curvature. But certain of the routes (in particular HS2, HS4 and HS6/HS10) pass through such (for the most part) undemanding landscapes that full line speed may well be available throughout the journey. For such routes, the estimates should be very accurate. For **all** routes, the estimates should give a good impression of what **can** be achieved.

I believe that these are the best estimates that can be produced. To get more accurate values would require a complete engineering design, with precise alignments, gradients and curve radii, enabling a comprehensive speed profile to be generated, (a first-rate civil engineering corporation would be very happy to provide that for you – for a few million!) and journey times derived from that. These would not, of course, be **estimates** any more, but exact, verifiable predictions.

Readers' attention is drawn in particular to HS2 and HS3, where the results can be compared with the estimates published by HS2 Ltd.

The results are now given for each route or route pair in turn. Refer to the original Route and Service Plans article for full details.

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HS1

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Euston Cross - Stratford HS South	8	8	4.9	4.9	4.9
Stratford HS South - Ebbsfleet	28	36	9.3	14.2	17.2
Ebbsfleet - Maidstone HS	25	61	8.7	22.9	28.9
Ebbsfleet - Ashford	52	88	14.1	28.3	34.3
Ashford - Dover Priory	34	122	10.5	38.8	47.8
Ashford - Appledore	14	102	6.4	34.6	43.6
Appledore - Rye	10	112	5.5	40.2	52.2
Rye - Winchelsea	3	115	3.1	43.3	58.3
Winchelsea - Ore	13	128	6.2	49.4	67.4
Ore - Hastings	2	130	2.1	51.5	72.5

HS Euston Cross – Maidstone / Dover / Hastings (2/3/7 stops):

Current fastest time (minutes) from London [and the above values] to:

•	Ebbsfleet	17	[18]
•	Maidstone	56	[29]
•	Ashford	36	[35]
•	Dover	83 (Javelin – 1 change)	[48]
•	Rye	72	[53]
•	Winchelsea	77	[59]
•	Hastings	91	[73]

HS2

1. HS Euston Cross – Birmingham / Manchester / Liverpool / Preston (2 stops in all cases) also Birmingham – Manchester (1 or 2 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Euston Cross - Old Oak Common	8	8	4.9	4.9	4.9
Old Oak Common - Birmingham Interchange	151	159	29.6	34.5	37.5
Birmingham Interchange - Birmingham Curzon St.	20	179	7.8	42.3	48.3
Old Oak Common - Manchester Interchange (non- stop)	286	294	52.1	57.0	60.0
Manchester Interchange - Manchester HS	8	302	4.9	61.9	67.9
Birmingham Curzon St Crewe	95	95	20.3	20.3	20.3
Crewe - Manchester Interchange	45	140	11.9	32.2	35.2
Manchester Interchange - Manchester HS	8	148	4.9	37.1	43.1
Birmingham Curzon St Manchester Interchange	140	140	27.8	27.8	27.8
Manchester Interchange - Manchester HS	8	148	4.9	32.7	35.7
Old Oak Common - Crewe	241	249	44.6	49.5	52.5
Crewe - Liverpool Lime St.	73	322	17.1	66.6	72.6
Crewe - Preston	83	332	18.3	67.8	73.8

Current fastest time (minutes) from London/Birmingham (with HS2 Ltd.'s estimates) [and the above values] to:

•	London – Birmingham New Street (Curzon)) 81	(49)	[49]
•	London - Stockport (M/C I/ch/Airport)	115	(59)	[60]
•	London – Manchester	127	(68)	[68]
•	London – Liverpool	128	(96)	[73]
•	London – Preston	128		[74].
•	Birmingham – Manchester	88	(41)	[36/43 – non-stop/ Crewe-stop]

I declare that the distances in the above spreadsheet are exactly as originally measured, and that no shading or refinement has been performed subsequently. The fact that I get exactly the same estimates as HS2 Ltd. is either an extraordinary coincidence, or HS2 Ltd.'s estimating methods are as crude as mine!

The significance of the above table of HS times is that these are all GC-gauge services, thus assuming the availability of sections of HS8 to Liverpool and Preston. These are in my plans, but not in HS2 Ltd.'s. HS2 Ltd.'s estimate for Liverpool is via the WCML above Crewe.

2. HS Elapsed Times Summary:

Section	Euston Cross - Birmingham HS	Euston Cross - Manchester HS	Euston Cross - Liverpool HS	Euston Cross - Preston HS	Birmingham - Manchester HS
Euston Cross - Old Oak Common	4.9	4.9	4.9	4.9	
Old Oak Common - Birmingham Interchange	37.5				
Birmingham Interchange - Birmingham Curzon St.	48.3		— —		
Old Oak Common - Manchester Interchange (non-stop)		60.0			
Manchester Interchange - Manchester HS		67.9			
Birmingham Curzon St Crewe					20.3
Crewe - Manchester Interchange					35.2
Manchester Interchange - Manchester HS					43.1
Birmingham Curzon St Manchester Interchange					27.8
Manchester Interchange - Manchester HS					35.7
Old Oak Common - Crewe			52.5	52.5	
Crewe - Liverpool Lime St.			72.6		
Crewe - Preston				73.8	

3. CC Euston – Liverpool / Manchester (3/9 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Euston - Old Oak Common	8	8	4.9	4.9	4.9
Old Oak Common - Crewe	241	249	44.6	49.5	52.5
Crewe - Runcorn	36	285	27.0	76.5	79.5
Runcorn - Liverpool Lime St.	21	306	21.0	97.5	100.5
Old Oak Common - Calvert	73	81	16.6	21.5	24.5
Calvert - Birmingham Interchange	78	159	17.4	38.9	44.9
Birmingham Interchange - Rugeley Trent Valley	41	200	11.3	50.2	59.2
Rugeley Trent Valley - Stafford	14	214	10	60.2	69.2
Stafford - Stone	13	227	11	71.2	80.2
Stone - Stoke-on- Trent	11	238	11	82.2	91.2
Stoke-on-Trent - Macclesfield	20	258	16	98.2	107.2
Macclesfield - Stockport	18	276	13	111.2	120.2
Stockport - Manchester Piccadilly	9	285	10	121.2	130.2

Current fastest time (minutes) from London [and the above values] to:

•	Crewe	90	[53]
•	Runcorn	113	[80]
•	Liverpool	128	[101]
•	Rugeley TV	98	[60]
•	Stafford	65	[70]
•	Stone	103 (1 change)	[81]
•	Stoke-on-Trent	84	[93]
•	Macclesfield	101	[108]
•	Stockport	115	[121]
•	Manahastar	127	[131]

The time for the CC service between Birmingham Interchange and Rugeley Trent Valley, via HS2 and Handsacre Junction, is calculated as normally for a HS section (taking the section length as 33 + 8 km). Only the short distance of 8km is run on the classic route, and it is assumed that the speed will have reduced sufficiently by Handsacre Junction for there to be no problem here.

The times to Stoke-on-Trent and Macclesfield are, frankly, disappointing. However, the times from Rugeley to Stafford, Stafford to Stone and Stone to Stoke-on-Trent are derived from current timetables, involving local, relatively slow services, with average speeds of 52mph, 44mph and 38mph respectively. We may reasonably expect a better performance from a CC train. The extra stops are essential to help fill the trains, as there's likely to be little if any traffic from London to Manchester (which is the bulk of the patronage of the current service). The CC service to Manchester is explicitly designed to ensure that Stoke-on-Trent and Macclesfield do not lose out when HS2 opens, as on HS2 Ltd.'s published plans they most disgracefully do. (There have been promises that they will continue to enjoy services at least as good as at present, but, as yet, no delivery on that.) It also serves a very important interconnection role, making connections at Calvert with the East-West line and with Crossrail 4, and at Birmingham Interchange with the HS7 service from Plymouth to Newcastle.

4. CC Euston – Preston (6/3 stops) and Scotland:

Section	Distance	Cumulative	Start - Stop	Cumulative	Elapsed Time from
	(km)	Distance (km)	Time (minutes)	Journey Time	London, inc. Station Wait Times
		(KIII)	(minutes)	(11111111111111)	
Euston - Old Oak Common	8	8	4.9	4.9	4.9
Old Oak Common - Calvert	73	81	16.6	21.5	24.5
Calvert - Birmingham Interchange	78	159	17.4	38.9	44.9
Birmingham Interchange - Crewe	90	249	19.4	58.4	67.4
Crewe - Warrington Bank Quay	38	287	18.0	76.4	88.4
Warrington Bank Quay - Wigan North Western	19	306	11.0	87.4	99.4
Wigan North Western - Preston	24	330	13.0	100.4	112.4
Old Oak Common - Crewe	241	249	44.6	49.5	52.5
Crewe - Wigan North Western (HS2 direct via Bamfurlong)	55	304	13.6	63.1	69.1
Wigan North Western - Preston	24	328	13.0	76.1	82.1
Old Oak Common - Wigan North Western	296	304	53.8	58.7	61.7
Wigan North Western - Preston	24	328	13.0	71.7	77.7
Preston - Edinburgh	272	600	148.0	219.7	225.7
Preston - Glasgow	273	601	140.0	211.7	217.7

Current fastest time (minutes) from London [and the above values] to:

- Crewe 90 [68]
- Warrington 104 [89]
- Wigan 115 [100]
- Preston 128 [113]

The times in the above table reflect HS2 Ltd.'s plans, where HS2 terminates at Bamfurlong Junction, and there is no GC-gauge route beyond that.

The CC service to Preston serves a very important interconnection role, making connections at Calvert with the East-West line and with Crossrail 4, and at Birmingham Interchange with the HS7 service from Swansea to Norwich. It splits / joins at Preston, the portions continuing to/from Blackpool North and Windermere.

The time for the faster, direct route between Crewe and Wigan, via HS2 and Bamfurlong Junction, is calculated as normally for a HS section (taking the section length as 50 + 5 km). Only the short distance of 5km is run on the classic route, and it is assumed that the speed will have reduced sufficiently by Bamfurlong Junction for there to be no problem here.

The main interest is in the times to Scotland. The times quoted between Preston and Edinburgh/Glasgow are the fastest in the current timetable, but include 3 stops – Lancaster, Oxenholme or Penrith, and Carlisle. (The Edinburgh service also assumes a stop at Haymarket, but **every** service approaching Waverley from the west assumes a stop at Haymarket.) HS2 Ltd. has promised a headline time to Edinburgh and Glasgow of within 3 hours. It must therefore find time savings of 35 - 45 minutes on the above schedule to make good that promise. Four stops can be dropped – the only purpose of including a stop at Wigan North Western in the above table is to allow my spreadsheet to calculate automatically the time from Old Oak Common – or 5, if Preston is dropped also. That saves possibly 20 minutes, but there will have to be an additional stop at (presumably) Carstairs to split / join the Glasgow and Edinburgh portions. (HS2's published service plans allow for two London – Scotland CC services per hour, so if both Edinburgh and Glasgow are to get two London trains per hour, there must be separate portions.) So there needs to be an actual acceleration of 15 - 25 minutes north of Preston. I don't say that this **can't** be done, (at least, without some serious infrastructure investment,) but I shall certainly be very interested to see **how** it is proposed to be done.

5. CC Elapsed Times Summary:

Section	Euston -	Euston -	Euston -	Euston	Euston -
	Manchester	Liverpool	Preston (direct	-	Scotland
	CC	CC	HS2 via	Preston	CC
			Bamfurlong	CC	
Euston - Old Oak Common	4.9	4.9	4.9	4.9	4.9
Old Oak Comm - Calvert	24.5			24.5	
Calvert - Birmingham Interchange	44.9			44.9	
Birmingham Interchange -	59.2				
Rugeley Trent Valley			I	I	I
Rugeley Trent Valley - Stafford	69.2				
Stafford - Stone	80.2				—
Stone - Stoke-oon-Trent	91.2				—
Stoke-on-Trent - Macclesfirld	107.2				—
Macclesfirld - Stockport	120.2				—
Stochport - Manchester Piccadilly	130.2				—
Old Oak Common - Crewe		52.5	52.5		—
Crewe - Runcorn		79.5			—
Runcorn - Liverpool Lime St.		100.5			—
Crewe - Wigan North Western (HS2 direct via Bamfurlong)			69.1		— —
Wigan North Western - Preston		 	82.1		
Birmingham Interchange - Crewe		+ 		67.4	
Crewe - Warrington Bank Quay		 ! !		88.4	
Warrington Bank Quay - Wigan				99.4	
North Western					
Wigan North Western - Preston		 		112.4	—
Old Oak Common - Wigan North Western					61.7
Wigan North Western - Preston		 	 	 	77.7
Preston - Edinburgh		 	+ ! !	 	225.7
Preston - Glasgow					217.7

The foregoing estimated timings all refer to service plan 4. The final sections refers to service plans 5 and 6, dealing with the extra-speculative Coventry Variant and Scottish extension.

6. Euston Cross – Birmingham via HS2-CV (4stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Euston Cross - Old Oak Common	8	8	4.9	4.9	4.9
Old Oak Common - Rugby HS	130	138	26.5	31.4	34.4
Rugny HS - Coventry HS	18	156	7.3	38.7	44.7
Coventry HS - Birmingham Interchange	17	173	7.1	45.8	54.8
Birmingham Interchange - Birmingham Curzon St.	20	193	11.5	57.3	69.3

Comparative timings (minutes), London to:

	С	urrent Fastest	Via HS2-CV	Via HS2-orig
•	Rugby HS	48	35	-
•	Coventry HS	59	45	-
•	Birmingham Intnl / Intchg	70	55	38
•	Birmingham New St. / Curzon S	St. 82	70	49

These are very respectable times for HS2-CV, though obviously overshadowed by HS2-orig's Birmingham times.

7. Euston Cross – Edinburgh (4stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Euston - Old Oak Common	8	8	4.9	4.9	4.9
Old Oak Common - Preston	324	332	58.4	63.3	66.3
Preston - Carlisle	138.0	470	27.4	90.8	96.8
Carlisle - Hawick	67.0	537	15.6	106.4	115.4
Hawick - Edinburgh	82.0	619	18.1	124.5	136.5

Current fastest time (minutes) from London [and the above values] to:

- Preston 128 [67]
- Carlisle 195 [97]
- Edinburgh 260 [137]

HS3 Mk2

HS3 Mk2 is a reconfiguration of the southern end of the route, to enable subsequent 4-tracking, with a major increase in capacity. It results in a very slight acceleration of the UHS services.

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Pancras Cross - Sheffield HS	248	248	45.8	45.8	45.8
Sheffield HS - Manchester HS	54	302	14.5	60.3	63.3
Manchester HS - Victoria LL	0.5	302.5	1.2	61.5	67.5
Victoria LL - Liverpool Lime St.	49	351.5	12.6	74.1	83.1
Pancras Cross - South Yorkshire	248	248	45.8	45.8	45.8
South Yorkshire - Leeds New Lane	52	300	13.5	59.3	62.3
South Yorkshire - York	73	321	16.6	62.4	65.4
York - Darlington	70	391	16.1	78.5	84.5
Darlington - Durham Relly Mill	33	424	10.3	88.8	97.8
Durham Relly Mill - Consett	20	444	7.7	96.5	108.5
Consett - Newcastle	22	466	8.1	104.6	119.6

1. UHS Services London – Liverpool / York / Newcastle (3/2/5 stops):

Current fastest time (minutes) from London (with HS2 Ltd.'s estimates) [and the above values] to:

•	Sheffield	120	(69/79*)	[46]
•	Leeds	131	(83)	[63]
•	York	110		[66]
•	Darlington	139		[85]
•	Durham	173		[98]
•	Newcastle	169		[120]
•	Manchester	127	(68)	[64]
•	Liverpool	128	(96)	[83]

(*) 69 minutes is HS2 Ltd.'s estimate from London to South Yorkshire (Meadowhall), and 79 minutes to Sheffield Midland. These values, and that for Leeds, show very clearly the time penalty imposed by the ridiculous routing via Birmingham.

Pancras Cross – Sheffield HS is the same distance as Pancras Cross – South Yorkshire. Either journey, non-stop, thus takes 46 minutes at an average speed of 203.2mph. Pancras Cross – Manchester HS with 1 stop takes 64 minutes at an average speed of 180mph. This actually takes 3 minutes less than HS2's time from Euston Cross to Manchester, although that journey is 6km shorter, but of course that journey has 2 intermediate stops rather than just 1, and the extra stop, Manchester Interchange, is only 5 miles from Manchester HS, which means in effect that the deceleration for the final station begins 5 miles further out, and the final 5 miles are taken at an average speed of only 60mph, and the overall journey at an average speed of 167mph.

The above time Pancras Cross – Liverpool is 10 minutes longer than HS2 by my plans, GC-gauge all the way, but 18 minutes shorter than my value for the CC service to Liverpool, along the classic route between Crewe and Liverpool (using current timetable times between Crewe and Liverpool) and 13 minutes shorter than HS2 Ltd.'s time to Liverpool (they've clearly assumed some acceleration on the WCML).

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Pancras Cross - York	321	321	57.9	57.9	57.9
York - Darlington	70	391	16.1	74.0	77.0
Darlington - Durham Relly Mill	33	424	10.3	84.4	90.4
Durham Relly Mill - Consett	20	444	7.7	92.1	101.1
Consett - Hexham	23	467	8.3	100.4	112.4
Hexham - Hawick	80	547	19.7	120.1	135.1
Hawick - Edinburgh	82	629	18.1	138.2	156.2
Newcastle - Hexham	23	23	8.3	8.3	8.3
Hexham - Hawick	80	103	19.7	28.0	31.0
Hawick - Lauder	37	140	10.6	38.6	44.6
Lauder - Edinburgh	45	185	11.9	50.6	59.6

Current fastest time (minutes) from London [and the above values] to:

• You	rk 11	0	[58]
• Dar	rlington 13	9	[77]
• Du	rham 17	3	[91]
• Edi	nburgh 26	0	[157]

And from Newcastle:

• Edinburgh 85 (via ECML, of course). [60]

3. UHS Elapsed Times Summary:

Section	Pancras Cross	Pancras	Pancras	Pancras Cross	Newcastle
	- Liverpool	York	Newcastle	- Eamburgh	- Edinburgh
Pancras Cross - Sheffield HS	45.8				
Sheffield HS - Manchester HS	63.3				
Manchester HS - Victoria LL	67.5				
Victoria LL - Liverpool Lime St.	83.1				
Pancras Cross - South Yorkshire		45.8	45.8		
South Yorkshire - Leeds New Lane		62.3			
South Yorkshire - York			65.4		
York - Darlington		 !	84.5		+ !
Darlington - Durham Relly Mill			97.8		
Durham Relly Mill - Consett			108.5		
Consett - Newcastle		 ! !	119.6		
Pancras Cross - York				57.9	
York - Darlington				77.0	
Darlington - Durham Relly Mill				90.4	
Durham Relly Mill - Consett				101.1	
Consett - Hexham		 ! !	 	112.4	
Hexham - Hawick				135.1	
Hawick - Edinburgh				156.2	
Newcastle - Hexham					8.3
Hexham - Hawick		 	 	 	31.0
Hawick - Lauder		i 	i 	i i +	44.6
Lauder - Edinburgh		i i i 	i I I	i I I	59.6

4. HS Metro Services London – York / Preston (7/8 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Pancras Cross - Luton & Dunstable Parkway	51	51	12.9	12.9	12.9
Luton & Dunstable Parkway - Northampton Castle	50	101	12.8	25.7	28.7
Northampton Castle - Leicester	58	159	14.1	39.8	45.8
Leicester - Nottingham	43	202	12.0	51.9	60.9
Nottingham - Derby	26	228	8.9	60.8	72.8
Nottingham - Sheffield HS	60	262	15.3	67.2	79.2
Sheffield HS - Huddersfield	53	315	15.2	82.4	97.4
Huddersfield - Leeds New Lane	24	339	9.4	91.8	109.8
Leeds New Lane - York	39	378	11.4	103.2	124.2
Sheffield HS - Manchester HS	54	316	14.5	81.7	96.7
Manchester HS - Victoria LL	0.5	316.5	1.2	82.9	100.9
Victoria LL - Bolton	17	333.5	7.1	90.0	111.0
Bolton - Preston	39	372.5	11.5	101.5	125.5

Note that the service to Derby involves one change – a (cross-platform) connection at Nottingham into an HS7 service, either Norwich – Swansea or Cleethorpes – Birmingham.

Current fastest time (minutes) from London (with HS2 Ltd.'s estimates) [and the above values] to:

•	Northampton	51		[29]
•	Leicester	62		[46]
•	Nottingham	100	(51/68*)	[61]
•	Derby	85	(51/71*)	[73]
•	Sheffield	120		[80]
•	Huddersfield	162 (with	n 1 change)	[98]
•	Leeds	131		[110]
•	York	110		[125]
•	Manchester HS	127		[97]
•	Bolton	164 (with	n 1 change)	[111]
•	Preston	128		[126]

(*) 51 minutes is HS2 Ltd.'s estimate from London to Toton (with 1 stop), 68 minutes to Nottingham Midland and 71 to Derby Midland. HS3's value of 61 minutes to Nottingham is with 3 stops, and 73 minutes to Derby is with 4 stops and 1 change. Purely for illustration, a non-stop London – Nottingham service by HS3 would take 38 minutes, and reach Derby in 49 minutes. I was not actually proposing such a service, initially, but, having seen what would be possible, this will certainly be one of the additional services enabled by HS3 Mk2's capacity enhancements. (See below for illustrative non-stop times.)

Okay, so even a HS Metro train can't, travelling via Huddersfield and with 7 intermediate stops, beat a non-stop service to York, straight up the ECML. But see the corresponding UHS services to York. Remarkably, it still beats the fastest service to Leeds, by a comfortable margin (but, again, see the UHS service to Leeds and on to York).

Moreover, even travelling via the East Midlands, with 5 intermediate stops, the HS Metro service still beats the current best time to Manchester (comfortably) and, with 8 intermediate stops, to Preston (just).

Pancras Cross to:	Distance (km)	Non-Stop Time (minutes)	Average Speed (kph)	Average Speed (mph)
Luton Airport Parkway	51	12.9	236.5	147.8
Northampton Castle	101	21.3	284.9	178.1
Leicester	154	30.1	306.9	191.8
Nottingham	197	37.7	313.5	195.9
Sheffield HS	248	45.8	325.1	203.2
South Yorkshire	248	45.8	325.1	203.2
Leeds New Lane	300	54.9	328.0	205.0
York	321	57.9	332.4	207.8

Specimen non-stop times:

Section	Distance	Cumulative	Start -	Cumulative	Elapsed Time from
	(km)	Distance (1mm)	Stop Time	Journey	London, inc. Station
		(KIII)	(minutes)	(minutes)	wait Times
St. Pancras - Luton	51	51	12.9	12.9	12.9
& Dunstable					
Parkway					
Luton &	50	101	12.8	25.7	28.7
Parkway -					
Northampton					
Castle					
Northampton	33	134	10.7	36.5	42.5
Castle - Rugby HS					
Rugby HS -	18	152	7.3	43.8	52.8
Coventry HS					
Coventry HS -	19	171	11.0	54.8	63.8
Birmingham					
		102			50 0
Birmingham	12	183	9.0	63.8	72.8
Rirmingham New					
St.					
Northampton	55	156	13.6	39.3	45.3
Castle - Leicester					
Leicester -	19	175	11	50.3	56.3
Loughborough					
Loughborough -	11	186	10	60.3	66.3
East Midlands					
Parkway East Midlands	17	203	17	77.3	83.3
Parkway - Derby	1/	205	17	11.5	05.5
Derby -	40	243	20	97.3	103.3
Chesterfield	υT	<u>4</u> 73	20	21.5	105.5
Chesterfield -	20	263	14	111.3	117.3
Sheffield					
Sheffield - South	5	268	6	117.3	123.3
Yorkshire					
Parkway		272		124.2	100.0
South Yorkshire	4	272	1	124.3	130.3
Rotherham					
Rotherham -	34	306	33	157.3	163.3
Wakefield					
Westgate					

Wakefield Westgate - Leeds City	16	322	14	171.3	177.3
Leeds City - Micklefield	15	337	15	186.3	192.3
Micklefield - York	15	352	15	201.3	207.3

Note: the time between Rotherham and Wakefield Westgate is an estimate – there are no non-stop services between them.

Current fastest time (minutes) from London [and the above values] to:

•	Northampton	51	[29]
•	Rugby	48	[43]
•	Coventry	59	[53]
•	Birmingham Int'l	70	[64]
•	Birmingham New St.	82	[73]
•	Leicester	62	[46]
•	Loughborough	73	[57]
•	East Midlands Pkwy	81	[67]
•	Derby	85	[84]
•	Chesterfield	105	[104]
•	Sheffield	120	[118]
•	Wakefield Westgate	114	[164]
•	Leeds	131	[178]
•	York	110	[208]

The last three (current) times are, of course, via the ECML, which isn't really comparing like with like.

The CC times to Birmingham are slightly better than the current best, but that to Northampton very much better (naturally).

Likewise the CC times as far as Leicester are very much better than current times, but the extra stops at Loughborough and East Midlands Parkway bring the times back up to current best times, to Derby and beyond.

6. HS Metro and CC Elapsed Times Summary:

Section	HS Metro	HS Metro	CC St.	CC St.
	Pancras	Pancras	Pancras -	Pancras
	Cross -	Cross -	Birmingham	- York
	York	Preston	New St.	
Pancras Cross - Luton & Dunstable Parkway	12.9	12.9		
St. Pancras - Luton & Dunstable Parkway			12.9	12.9
Luton & Dunstable Parkway - Northampton Castle	28.7	28.7	28.7	28.7
Northampton Castle - Leicester	45.8	45.8		45.8
Leicester - Nottingham	60.9	60.9		
Nottingham - Derby	72.8	72.8		
Nottingham - Sheffield HS	79.2	79.2		
Sheffield HS - Huddersfield	97.4			
Huddersfield - Leeds New Lane	109.8			
Leeds New Lane - York	124.2			
Sheffield HS - Manchester HS		96.7	i	
Manchester HS - Victoria LL		100.9	I	I
Victoria LL - Bolton		111.0		
Bolton - Preston		125.5		
Northampton Castle - Rugby HS			42.5	
Rugby HS - Coventry HS			52.8	
Coventry HS - Birmingham International			63.8	
Birmingham International - Birmingham New St.			72.8	
Leicester - Loughborough		 		56.3
Loughborough - East Midlands Parkway				66.3
East Midlands Parkway - Derby				83.3
Derby - Chesterfield		 		103.3
Chesterfield - Sheffield		+		117.3
Sheffield - South Yorkshire Parkway				123.3

South Yorkshire Parkway - Rotherham		130.3
Rotherham - Wakefield Westgate		163.3
Wakefield Westgate - Leeds City		177.3
Leeds City - Micklefield		192.3
Micklefield - York		207.3

HS3 Mk2 with 4 tracks

The widening of HS3 Mk2 to 4 tracks below Beighton Junction, enables many new services to be introduced. This again results in a very slight acceleration of the UHS services.

1. UHS Services London – Derby/Liverpool/York/Newcastle (1/3/2/5 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Pancras Cross - Nottingham HS	194	194	37.2	37.2	37.2
Nottingham HS - Derby	26	220	8.8	46.0	49.0
Pancras Cross - Sheffield HS	245	245	45.3	45.3	45.3
Sheffield HS - Manchester HS	54	299	14.5	59.8	62.8
Manchester HS - Victoria LL	0.5	299.5	1.2	61.0	67.0
Victoria LL - Liverpool Lime St.	49	348.5	12.6	73.6	82.6
Victoria LL - Bolton	17	365.5	7.1	68.1	77.1
Bolton - Preston	39	404.5	11.5	79.6	91.6
Pancras Cross - South Yorkshire	245	245	45.3	45.3	45.3
South Yorkshire - Leeds New Lane	52	297	13.5	58.8	61.8
South Yorkshire - York	73	318	16.6	61.9	64.9
York - Darlington	70	388	16.1	78.0	84.0
Darlington - Durham Relly Mill	33	421	10.3	88.3	97.3
Durham Relly Mill - Consett	20	441	7.7	96.0	108.0
Consett - Newcastle	22	463	8.1	104.1	119.1

Current fastest time (minutes) from London (with HS2 Ltd.'s estimates) [and the above values] to:

•	Nottingham	100	(51/68*)	[38]
•	Derby	85	(51/71*)	[49]
•	Sheffield	120	(69/79#)	[46]
•	Leeds	131	(83)	[62]
•	York	110		[65]
•	Darlington	139		[84]
•	Durham	173		[98]
•	Newcastle	169		[119]
•	Manchester	127	(68)	[63]
•	Liverpool	128	(96)	[83]
•	Bolton	164 (v	vith 1 change)	[77]
•	Preston	128		[92]

(*) 51 minutes is HS2 Ltd.'s estimate from London to Toton, 68 minutes to Nottingham Midland and 71 minutes to Derby Midland. (#) 69 minutes is HS2 Ltd.'s estimate from London to South Yorkshire (Meadowhall), and 79 minutes to Sheffield Midland. These values, and that for Leeds, all show very clearly the time penalty imposed by the ridiculous routing via Birmingham.

Pancras Cross – Sheffield HS is the same distance as Pancras Cross – South Yorkshire. Either journey, non-stop, thus takes 46 minutes at an average speed of 202.8mph. Pancras Cross – Manchester HS with 1 stop takes 63 minutes at an average speed of 178.5mph. This actually takes 5 minutes less than HS2's time from Euston Cross to Manchester, although that journey is 6km shorter, but of course that journey has 2 intermediate stops rather than just 1, and the extra stop, Manchester Interchange, is only 5 miles from Manchester HS, which means in effect that the deceleration for the final station begins 5 miles further out, and the final 5 miles are taken at an average speed of only 60mph, and the overall journey at an average speed of 167mph.

The above time Pancras Cross – Liverpool is 10 minutes longer than HS2 by my plans, GC-gauge all the way, but 18 minutes shorter than my value for the CC service to Liverpool, along the classic route between Crewe and Liverpool (using current timetable times between Crewe and Liverpool) and 13 minutes shorter than HS2 Ltd.'s time to Liverpool (they've clearly assumed some acceleration on the WCML).

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Pancras Cross - York	318	318	57.4	57.4	57.4
York - Darlington	70	388	16.1	73.5	76.5
Darlington - Durham Relly Mill	33	421	10.3	83.9	89.9
Durham Relly Mill - Consett	20	441	7.7	91.6	100.6
Consett - Hexham	23	464	8.3	99.9	111.9
Hexham - Hawick	80	544	19.7	119.6	134.6
Hawick - Edinburgh	82	626	18.1	137.7	155.7
Newcastle - Hexham	23	23	8.3	8.3	8.3
Hexham - Hawick	80	103	19.7	28.0	31.0
Hawick - Lauder	37	140	10.6	38.6	44.6
Lauder - Edinburgh	45	185	11.9	50.6	59.6

Current fastest time (minutes) from London [and the above values] to:

•	York	110	[58]
•	Darlington	139	[77]
•	Durham	173	[90]
•	Edinburgh	260	[1567]

And from Newcastle:

• Edinburgh 85 (via ECML, of course). [60]

3. UHS Elapsed Times Summary:

Section	Pancras	Pancras	Pancras	Pancras	Pancras	Pancras	Newcastle
	Cross - Derby	Cross - Liverpool	Cross - Preston	Cross - York	Cross - Newcastle	Cross - Edinburgh	- Edinburgh
Damana Crass	27.2	21, 01,000				20110 01 811	200000080
Nottingham	57.2						
Nottingham - Derby	49.0						
Pancras Cross - Sheffield HS		45.3	45.3				
Sheffield HS - Manchester HS		62.8	62.8				
Manchester HS - Victoria LL		67.0	67.0				
Victoria LL - Liverpool Lime St.		82.6			+ 		
Victoria LL - Bolton			77.1		+ 	 	
Bolton - Preston		 	91.6		+ ! ! !	 ! !	
Pancras Cross - South Yorkshire				45.3	45.3		
South Yorkshire - Leeds New Lane				61.8			
South Yorkshire - York					64.9		
York - Darlington		 			84.0		
Darlington - Durham Relly Mill					97.3		
Durham Relly Mill - Consett					108.0		
Consett - Newcastle		 	 		119.1		
Pancras Cross - York			F			57.4	
York - Darlington						76.5	
Darlington - Durham Relly Mill						89.9	
Durham Relly Mill - Consett					+ 	100.6	
Consett - Hexham					+ 	111.9	
Hexham - Hawick			 		+ 	134.6	
Hawick - Edinburgh			 		+ 	155.7	
Newcastle - Hexham		 	 		+ 		8.3
Hexham - Hawick	[! !		+ !	 	31.0
Hawick - Lauder	[+ 		44.6
Lauder - Edinburgh			 ! !		 		59.6

HS4

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Euston Cross - Old Oak Common	8	8	4.9	4.9	4.9
Old Oak Common - LHR Interchange	20	28	7.7	12.6	15.6
LHR Interchange - Bristol Parkway	152	180	29.8	42.4	48.4
Bristol Parkway - Cardiff	48	228	12.4	54.8	63.8
Cardiff - Cardiff (Rhoose) Airport	15	243	6.7	61.5	73.5
Cardiff (Rhoose) Airport - Port Talbot	39	282	11.5	73.0	88.0
Port Talbot - Swansea	13	295	6.2	79.2	97.2
Bristol Parkway - Bristol Temple Meads	8	303	4.9	47.3	56.3

1. HS Euston Cross – Swansea / Bristol Temple Meads (6/3 stops):

Current fastest time (minutes) from London [and the above values] to:

- Bristol Parkway 80 [49]
- Cardiff 121 [64]
- Port Talbot 157 [88]
- Swansea 178 [98]
- Bristol Temple Meads 99 [57]

2. HS Paddington – Plymouth (6

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Paddington - Old Oak Common	5	5	3.9	3.9	3.9
Old Oak Common - LHR Interchange	20	25	7.7	11.6	14.6
LHR Interchange - Bristol Parkway	152	177	29.8	41.4	47.4
Bristol Parkway - Bristol Temple Meads	8	185	4.9	46.3	55.3
Bristol Temple Meads - Taunton	71	256	17.9	64.2	76.2
Taunton - Exeter St. David's	48	304	13.3	77.5	92.5
Exeter St. David's - Plymouth	65	369	16.7	94.2	112.2

This is in fact a classic-compatible service, but high speed all the way to Plymouth, then on the classic route to Penzance and, perhaps, Padstow. Between Old Oak Common and Bristol Temple Meads, times are exactly as in the previous table (but 1 minute less from London, as it starts from Paddington).

Current fastest time (minutes) from London [and the above times] to:

- Bristol Parkway 80 [48]
- Bristol Temple Meads 99 [56]
- Taunton 102 [77]
- Exeter St. David's 120 [93]
- Plymouth 179 [113]

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Paddington - Old Oak Common	5	5	3.9	3.9	3.9
Old Oak Common - LHR Interchange	20	25	7.7	11.6	14.6
LHR Interchange - Swindon	97	102	20.6	32.2	38.2
Swindon - Bristol Parkway	55	80	13.6	45.8	54.8
Bristol Parkway - Newport	34	114	22.0	67.8	76.8
Newport - Cardiff	35	149	15.0	82.8	91.8
Cardiff - Bridgend	32	181	23.0	105.8	114.8
Bridgend - Port Talbot	19	200	13.0	118.8	127.8
Port Talbot - Neath	9	209	8.0	126.8	135.8
Neath - Swansea	13	222	13.0	139.8	148.8
Swindon - Royal Wootton Bassett	10	112	7	39.2	45.2
Royal Wootton Bassett - Chippenham	18	130	8	47.2	53.2
Chippenham - Bath Spa	20	150	15	62.2	68.2
Bath Spa - Bristol Temple Meads	18	168	15	77.2	83.2

Current fastest time (minutes) from London [and the above values] to:

- Swindon 53 [39]
- Bristol Parkway 80 [55]
- Newport 105 [77]
- Cardiff 121 [92]
- Bridgend 144 [115]
- Port Talbot 157 [128]
- Neath 165 [136]
- Swansea 178 [149]
- Chippenham 68 [54]
- Bath Spa 83 [69]
- Bristol Temple Meads 99 [84]

Estimated Journey Times for High Speed Services v1.11

Note that the South Wales service, although it makes a station stop at Swindon, travels on HS4 all the way to Bristol Parkway. Note how all the South Wales destinations on the classic route enjoy a time benefit of nearly 30 minutes, by their CC service travelling on HS4 all the way to Bristol Parkway. Stations on the classic route between Swindon and Bristol likewise enjoy a time benefit of nearly 15 minutes, by their CC service travelling on HS4 as far as Swindon.

4. Summary Table:

Section	Euston	Euston Cross	Paddington -	Paddington	Paddington -
	Cross -	- Bristol	Plymouth HS	- Swansea	Bristol
	Swansea	Temple Moods HS			Temple Meads
Fuston Cross OR	49	49	3.9	3.9	39
Paddington - Old	т.>	7.7	5.7	5.2	5.7
Oak Common					
Old Oak Common -	15.6	15.6	14.6	14.6	14.6
LHR Interchange	15.0	10.0	17.0	17.0	17.0
I UD Interchange -	48.4	18.4	A7 A	l	l
Bristol Parkway	40.4	40.4	47.4		
Bristol Parkway -	63.8	!			
Cardiff		I			I
Cardiff - Cardiff	73.5				
(Rhoose) Airport		I			I
Cardiff (Rhoose)	88.0				
Airport - Port Talbot					I
Port Talbot -	97.2				
Swansea		1			I
Bristol Parkway -		56.3	55.3		
Bristol Temple					
Meads		[]	ļ		
LHR Interchange - Swindon				38.2	38.2
Swindon - Bristol Parkway				54.8	
Rristol Parkway -		<u></u>		76.8	
Newport	i			, 0.0	
Newport - Cardiff	'		· · ·	91.8	· · · ·
Cordiff Bridgend			· ·	11/1 8	
Dil d Dat			<u> </u>	114.0	I
Bridgend - Port	i		I	127.8	I
Port Talbot - Neath				135.8	
Neath - Swansea	'	'	· ·	148.8	· ·
Sevindon Doval		¦	· ·	170.0	1 15 2
Wootton Bassett					43.2
Royal Wootton					53.2
Bassett -	i				
Chippennam Chippenham Dath			ļ		68.2
Chippennam - Bau	i				08.2
spa	······		· ·		
Bath Spa - Bristol					83.2
Temple Meaus			1		

Bristol Temple Meads - Taunton		76.2	
Taunton - Exeter St. David's		92.5	
Exeter St. David's - Plymouth		112.2	

HS5

Pancras Cross – Brighton / Newhaven / Eastbourne / Tunbridge Wells /
Littlehampton / Bognor / Southampton (3/5/4/4/5/5/10 stops):

Section	Distance	Cumulative	Start -	Cumulative	Elapsed Time from
	(km)	Distance	Stop Time	Journey Time	London, inc.
		(km)	(minutes)	(minutes)	Station Wait Times
Pancras Cross - Victoria	5	5	3.9	3.9	3.9
Low Level					
Victoria Low Level - East	13	18	6.2	10.1	13.1
Croydon					
East Croydon - Gatwick Airport	30	48	9.7	19.8	25.8
Gatwick Airport - Brighton	39	87	11.5	31.3	40.3
Gatwick Airport - Lewes	42	90	12.5	32.3	41.3
Lewes - Newhaven Town	10	100	5.5	37.8	49.8
Newhaven Town -	1	101	1.2	39.0	54.0
Newhaven Marine					
Lewes - Eastbourne	24	114	8.5	40.8	52.8
East Croydon - Tonbridge	42	60	12.5	22.6	28.6
Tonbridge - Tunbridge Wells	8	68	4.9	27.5	36.5
Tunbridge Wells - Tunbridge Wells East	1	69	1.7	29.2	41.2
Gatwick Airport - Horsham	18	66	7.8	27.6	36.6
Horsham - Arundel HS	33	99	10.3	37.9	49.9
Arundel HS - Littlehampton	6	105	4.2	42.1	57.1
Arundel HS - Bognor Regis	12	111	6.0	43.8	58.8
Arundel HS - Chichester	18	117	7.3	45.2	60.2
Chichester - Hayling Island	15	132	6.7	51.8	69.8
Hayling Island -	8	140	4.9	56.7	77.7
Portsmouth and Southsea					-
Portsmouth and Southsea - Gosport	3	143	3.0	59.7	83.7
Gosport - Hythe	21	164	7.9	67.6	94.6
Hythe - Southampton	6	170	4.2	71.8	101.8

Current fastest time (minutes) from London [and the above values] to:

•	Gatwick Airport	29	[26]
•	Brighton	54	[41]
•	Lewes	60	[42]
•	Newhaven	81 (1 change)	[54]
•	Eastbourne	61	[53]
•	Tonbridge	40	[29]
•	Tunbridge Wells	54	[42]
•	Horsham	49	[37]
•	Littlehampton	99	[57]
•	Bognor Regis	98	[59]
•	Chichester	88	[61]
•	Portsmouth & Southsea	88	[78]
•	Southampton	74	[102]

HS6/HS10

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London, inc. Station Wait Times
Pancras Cross - Stratford HS North	8	8	4.9	4.9	4.9
Stratford HS North - Stansted Airport	45	53	12.7	17.6	20.6
Stansted Airport - Cambridge	37	90	11.1	28.7	34.7
Cambridge - Ely	23	113	8.3	37.0	46.0
Ely - Norwich	80	193	19.7	56.8	68.8

1. Pancras Cross – Norwich (4 stops):

Current fastest time (minutes) from London [and the above values] to:

- Stansted Airport 45 [21]
- Cambridge 46 [35]
- Ely 67 [46]
- Norwich 108 [69]

2. Pancras Cross / Norwich – Hull Paragon (8/4 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from London/Norwich, inc. Station Wait Times
Pancras Cross - Stratford HS North	8	8	4.9	4.9	4.9
Stratford HS North - Stansted Airport	45	53	12.7	17.6	20.6
Stansted Airport - Cambridge	37	90	11.1	28.7	34.7
Cambridge - Ely	23	113	8.3	37.0	46.0
Ely - Peterborough	45	158	12.7	49.8	61.8
Peterborough - Lincoln	85	243	20.7	70.5	85.5
Lincoln - Gainsborough Central	25	268	8.7	79.2	97.2
Gainsborough Central - Brigg	26.0	294	8.9	88.1	109.1
Brigg - Hull Paragon	25.0	319	8.7	96.8	120.8
Norwich - Peterborough	121	121	27.9	27.9	27.9
Peterborough - Lincoln	85	206	20.7	48.6	51.6
Lincoln - Gainsborough Central	25	231	8.7	57.3	63.3
Gainsborough Central - Brigg	26.0	257	8.9	66.3	75.3
Brigg - Hull Paragon	25.0	282	8.7	75.0	87.0

Current fastest time (minutes) from London [and the above values] to:

•	Stansted Airport	45	[21]
•	Cambridge	46	[35]
•	Ely	67	[46]
•	Peterborough	45	[62]
•	Lincoln	118	[86]
•	Gainsborough	112 (1 change)	[98]
•	Brigg	187 (1 change)	[109]
•	Hull Paragon	148	[121]

Current fastest time (minutes) from Norwich [and the above values] to:

•	Peterborough	86	[28]
•	Lincoln	176 (1 change)	[52]
•	Gainsborough	223 (2 changes)	[64]
•	Hull Paragon	238 (2 changes)	[87]

Okay so even a HS train can't, travelling via Cambridge and Ely, and with 4 intermediate stops, beat a current non-stop dash to Peterborough, straight up the ECML (actually it could, if it were non-stop or 1 stop, since each station stop imposes a time penalty of c.7 minutes), but it beats the best current to Hull, even travelling via Cambridge, Ely **and Lincoln**, and with 8 intermediate stops, by a very comfortable margin.

HS7

1. Newcastle – Plymouth (15 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Newcastle, inc. Station Wait Times
Newcastle - Consett	22	22	8.1	8.1	8.1
Consett - Durham Relly Mill	20	42	7.7	15.8	18.8
Durham Relly Mill - Darlington	33	75	10.3	26.1	32.1
Darlington - York	70	145	16.1	42.2	51.2
York - Leeds New Lane	39	184	11.4	53.7	65.7
Leeds New Lane - Huddersfield	24	208	8.5	62.2	77.2
Huddersfield - Sheffield	53	261	15.2	77.4	95.4
Sheffield - Derby	70	331	16.9	94.3	115.3
Derby - Birmingham Interchange	59	390	15.5	109.8	133.8
Birmingham Interchange - Worcester Shrub Hill	49	439	13.5	123.3	150.3
Worcester Shrub Hill - Cheltenham Spa	35	474	10.7	134.0	164.0
Cheltenham Spa - Bristol Parkway	61	535	15.9	149.9	182.9
Bristol Parkway - Bristol Temple Meads	8	543	4.9	154.8	190.8
Bristol Temple Meads - Taunton	71	614	17.9	172.7	211.7
Taunton - Exeter St. David's	48	662	13.3	186.0	228.0
Exeter St. David's - Plymouth	65	727	16.7	202.8	247.8

Current fastest time (minutes) from Newcastle [and the above values] to:

•	Durham	11	[19]
•	Darlington	28	[37]
•	York	56	[52]
•	Leeds	85	[66]
•	Huddersfield	111	[78]
•	Sheffield	105	[96]
•	Derby	136	[116]
•	Birmingham	172	[134]
•	Worcester	232	[151]
•	Cheltenham Spa	229	[164]
•	Bristol Parkway	259	[183]
•	Bristol Temple Meads	s 271	[191]
•	Taunton	308	[212]
•	Exeter St. David's	334	[228]
•	Plymouth	428	[248]

It is no surprise that the times from Newcastle to Durham and Darlington are not as fast as the current fastest times, straight down the ECML, given that Newcastle is served by a spur from Consett, the main line of HS3 proceeding to the Borders and Hawick. From York on, the situation is very different.

2.	Norwich – Swansea	(10 stops):
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Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Norwich, inc. Station Wait Times
Norwich - Peterborough	121	121	27.9	27.9	27.9
Peterborough - Nottingham	85	206	20.7	48.6	51.6
Nottingham - Derby	26	232	8.9	57.5	63.5
Derby - Birmingham Interchange	59	291	15.5	73.1	82.1
Birmingham Interchange - Worcester Shrub Hill	49	340	13.5	86.6	98.6
Worcester Shrub Hill - Cheltenham Spa	35	375	10.7	97.3	112.3
Cheltenham Spa - Bristol Parkway	61	436	15.9	113.2	131.2
Bristol Parkway - Cardiff	48	484	12.4	125.6	146.6
Cardiff - Rhoose Airport	15	499	6.7	132.3	156.3
Rhoose Airport - Port Talbot#	39	538	11.5	143.8	170.8
Port Talbot - Swansea	13	551	6.2	150.0	180.0

Current fastest time (minutes) from Norwich [and the above values] to:

- Peterborough 86 [28]
- Nottingham 156 [52]
- Derby 206 (2 changes) [64]
- Birmingham 221 (1 change) [82]
- Worcester 284 (2 changes) [99]
- Cheltenham 293 (2 changes) [113]
- Bristol Parkway 248 (2 changes) [132]
- Cardiff 289 (2 changes) [147]
- Port Talbot 328 (2 changes) [171]
- Swansea 349 (2 changes) [180]

3. Birmingham – York / Cleethorpes (4/6 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Birmingham, inc. Station Wait Times
Birmingham Curzon St Derby	63	63	16.3	16.3	16.3
Derby - Sheffield	70	133	18.5	34.8	37.8
Sheffield - Huddersfield	53	186	15.2	50.0	56.0
Huddersfield - Leeds New Lane	24	210	8.5	58.5	67.5
Leeds New Lane - York	39	249	11.4	69.9	81.9
Derby - Nottingham	26	89	8.9	25.2	28.2
Nottingham - Newark Castle	27	116	22.0	47.2	50.2
Newark Castle - Lincoln	26	142	28.0	75.2	78.2
Lincoln - Market Rasen	25	167	16.0	91.2	94.2
Lincoln - Grimsby Town	47	214	37.0	128.2	131.2
Grimsby Town - Cleethorpes	5	219	10.0	138.2	141.2

Current fastest time (minutes) from Birmingham [and the above values] to:

•	Derby	35	[17]
•	Sheffield	74	[38]
•	Huddersfield	134 (1 change)	[56]
•	Leeds	118	[68]
•	York	129	[82]
•	Nottingham	69	[29]
•	Newark Castle	107 (1 change)	[51]
•	Lincoln	139 (2 changes)	[79]
•	Market Rasen	169 (2 changes0	[95]
•	Grimsby Town	187 (1 change)	[132]
•	Cleethorpes	197 (1 change)	[142]

4. Birmingham – Cardiff /Bristol Temple Meads (4 stops each):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Birmingham, inc. Station Wait Times
Birmingham Curzon St Birmingham Interchange	20	20	8	7.7	7.7
Birmingham Interchange - Worcester Shrub Hill	49	69	14	21.2	24.2
Worcester Shrub Hill - Cheltenham Spa	35	104	11	31.9	37.9
Cheltenham Spa - Bristol Parkway	61	165	16	47.9	56.9
Bristol Parkway - Cardiff	48	213	13	61.2	73.2
Bristol Parkway - Bristol Temple Meads	8	173	5	52.8	64.8

Current fastest time (minutes) from Birmingham [and the above values] to:

- Worcester 38 [25]
- Cheltenham 40 [38]
- Bristol Parkway 72 [57]
- Cardiff 120 [74]
- Bristol Temple Meads 84 [65]

HS8/HS9

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Liverpool, inc. Station Wait Times
Liverpool Lime St Victoria LL	49	49	12.6	12.6	12.6
Victoria LL - Manchester HS	1	50	1.2	13.8	16.8
Manchester HS - Huddersfield	39	89	11.5	25.3	31.3
Huddersfield - Leeds New Lane	24	113	8.5	33.8	42.8
Leeds New Lane - York	39	152	10.9	44.8	56.8
York - Darlington	70	222	16.1	60.9	75.9
Darlington - Durham Relly Mill	33	255	10.3	71.2	89.2
Durham Relly Mill - Consett	20	275	7.7	78.9	99.9
Consett - Newcastle	22	297	8.1	87.0	111.0

1. Liverpool Lime St. – Newcastle (8 stops):

Current fastest time (minutes) from Liverpool [and the above values] to:

- Manchester 47 [17]
- Huddersfield 83 [32]
- Leeds 107 [43]
- York 133 [57]
- Darlington 176 [76]
- Durham 199 [100]
- Newcastle 207 [111]

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - Bolton	32	32	9.8	9.8	9.8
Bolton - Victoria LL	17	49	7.1	16.9	19.9
Victoria LL - Manchester HS	1	50	1.2	18.1	24.1
Manchester HS - Sheffield HS	54	104	14.5	32.6	41.6
Sheffield HS - Nottingham	60	164	15.7	48.3	60.3
Nottingham - Peterborough	85	249	20.7	69.0	84.0
Peterborough - Norwich	121	370	27.9	96.9	114.9

2. Preston – Norwich (6 stops):

Current fastest time (minutes) from Preston [and the above values] to:

- Bolton 21 [10]
- Manchester 40 [24]
- Sheffield 107 (1 change) [42]
- Nottingham 161 (1 change) [61]
- Peterborough 204 (2 changes) [84]
- Norwich 315 (3 changes) [115]

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Liverpool, inc. Station Wait Times
Liverpool Lime St Victoria LL	49	49	12.6	12.6	12.6
Victoria LL - Manchester HS	1	50	1.2	13.8	16.8
Manchester HS - Huddersfield	39	89	14.2	28.0	34.0
Huddersfield - Leeds New Lane	24	113	9.7	37.6	46.6
Leeds New Lane - York	39	152	10.9	48.6	60.6
York - Darlington	70	222	16.1	64.7	79.7
Darlington - Durham Relly Mill	33	255	10.3	75.0	93.0
Durham Relly Mill - Consett	20	275	7.7	82.7	103.7
Consett - Newcastle	22	297	8.1	90.8	114.8

Current fastest time (minutes) from Liverpool [plus 300kph times] {and 200kph times} to:

- Manchester 47 [17] {17}
- Huddersfield 83 [32] {34}
- Leeds 107 [43] {47}
- York 133 [57] {61}
- Darlington 176 [76] {80}
- Durham 199 [100] {104}
- Newcastle 207 [111] {115}

Over the relatively short distance between Manchester and Leeds a 50% higher line speed saves precisely 4 minutes (16.7% of 24 minutes) compared with a line speed of 125mph, with which we're all very familiar. (The **percentage** saving over that particular section is significant, but the **absolute** saving trivial as the section is so short.) Most people (including me) would regard it as hardly worth the effort and extra expense. A 125mph Northern Trans-Pennine route (the central section at least) is entirely satisfactory.

4. *Preston – Norwich (6 stops) Central Line Speed 200kph:*

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - Bolton	32	32	9.8	9.8	9.8
Bolton - Victoria LL	17	49	7.1	16.9	19.9
Victoria LL - Manchester HS	1	50	1.2	18.1	24.1
Manchester HS - Sheffield HS	54	104	18.7	36.7	45.7
Sheffield HS - Nottingham	60	164	15.7	52.5	64.5
Nottingham - Peterborough	85	249	20.7	73.2	88.2
Peterborough - Norwich	121	370	27.9	101.1	119.1

Current fastest time (minutes) from Preston [plus 300kph times] {and 200kph times} to:

•	Bolton	21	[10]	{10}
•	Manchester	40	[24]	{24}
•	Sheffield	107 (1 change)	[42]	{46}
•	Nottingham	161 (1 change)	[61]	<i>{</i> 65 <i>}</i>
•	Peterborough	204 (2 changes)	[84]	{88}
•	Norwich	315 (3 changes)	[115]	{119}

Over the relatively short distance between Manchester and Sheffield a 50% higher line speed saves precisely 4 minutes (21% of 19 minutes) compared with a line speed of 125mph, with which we're all very familiar. (The **percentage** saving over that particular section is significant, but the **absolute** saving trivial as the section is so short.) Most people (including me) would regard it as hardly worth the effort and extra expense. A 125mph Southern Trans-Pennine route (the central section at least) is entirely satisfactory.

HS11/HS12

1. Euston Cross – Dover (8 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Euston Cross - Stratford HS South	8	8	4.9	4.9	4.9
Stratford HS South - Shenfield HS	26	34	8.9	13.8	16.8
Shenfield HS - Southend Airport	27	61	9.1	22.9	28.9
Southend Airport - Southend HS	4	65	3.5	26.4	35.4
Southend HS - Grain	10	75	5.5	31.9	43.9
Grain - Sheerness HS	6	81	4.2	36.1	51.1
Sheerness HS - Faversham	16	97	6.9	43.0	61.0
Faversham - Canterbury East	14	111	6.4	49.4	70.4
Canterbury East - Dover Priory	24	135	8.5	57.9	81.9

Current fastest time (minutes) from London [and the above values] to:

٠	Shenfield	22		[17]
•	Southend Airport	52		[29]
•	Southend	51		[36]
•	Faversham	63	(Javelin)	[61]
•	Canterbury East	77	(56 to Canterbury West by Javelin)	[71]
•	Dover	83	(Javelin – 1 change)	[82]

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Liverpool, inc. Station Wait Times
Euston Cross - Stratford HS South	8	8	4.9	4.9	4.9
Stratford HS South - Shenfield HS	26	34	8.9	13.8	16.8
Shenfield HS - Chelmsford	14	48	6.4	20.2	26.2
Chelmsford - Colchester	34	82	10.5	30.7	39.7
Colchester - Ipswich HS	26	108	8.9	39.6	51.6
Ipswich HS - Beccles	64	172	16.5	56.2	71.2
Beccles - Norwich	30	202	9.7	65.9	83.9
Beccles - Lowestoft			18	74.2	92.2
Beccles - Reedham South Junction (HS12)	11		5.7	61.9	79.9
Reedham - Yarmouth			16.0	77.9	95.9

2. Euston Cross – Norwich (6 stops)

The Lowestoft and Yarmouth times are by cross-platform connection at Beccles. Both the Norwich and Lowestoft trains can depart Beccles simultaneously, and the Yarmouth portion immediately afterwards. 18 minutes is the current time Beccles – Lowestoft; with HS12 this would presumably be reduced as the connection would be with the CC service Liverpool St. – Lowestoft/Yarmouth, serving the East Suffolk Line stations and splitting/joining at Beccles. The Yarmouth portion travels along HS12 until Reedham South Junction, then switches to the classic route to reach Yarmouth via Berney Arms.

Current fastest time (minutes) from London [and the above values] to:

- Shenfield 22 [17]
- Chelmsford 32 [27]
- Colchester 46 [40]
- Ipswich 67 [52]
- Beccles 145 (1 change) [72]
- Lowestoft 155 (1 change at Norwich) [93]
- Yarmouth 159 (1 change at Norwich) [96]
- Norwich 108 [84]

HS13/HS14

1.	Newcraighall HS –	Glasgow /	Dundee /	Aberdeen	(4/6/8or5	stops):
						····

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Newcraighall, inc. Station Wait Times	
Newcraighall HS - Edinburgh Waverley	7	7	4.6	4.6	4.6	
Edinburgh Waverley - Haymarket HS	2	9	2.5	7.1	10.1	
Haymarket HS - Edinburgh Airport	9	18	5.2	12.3	18.3	
Edinburgh Airport - Glasgow Bellgrove	68	86	17.3	29.6	38.6	
Glasgow Bellgrove - Glasgow St. Enoch	2	88	5.5	35.1	47.1	
Edinburgh Airport - Stirling	44	62	13.4	25.7	34.7	
Stirling - Gleneagles	28	90	9.3	35.0	47.0	
Gleneagles - Perth	22	112	8.1	43.1	58.1	
Stirling - Perth	50	112	13.7	39.4	51.4	
Perth - Dundee Tay Bridge	48	160	13.3	56.4	74.4	
Perth - Coupar Angus	25	137	8.7	48.1	63.1	
Coupar Angus - Forfar	25	162	8.7	56.8	74.8	
Forfar - Bridge of Dun	25	187	8.7	65.5	86.5	
Bridge of Dun - Aberdeen	59	246	15.5	81.1	105.1	
Perth - Aberdeen	134	246	30.5	69.9	84.9	

Note: The service to Dundee stops at Gleneagles; the services to Aberdeen do not.

Current fastest time (minutes) from Edinburgh [and the above values] to:

the bridges!]
1

2. Glasgow – Edinburgh / Dundee / Aberdeen / Kilmarnock / Ayr (3/4/7or4/2/3 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Glasgow, inc. Station Wait Times	
Glasgow St. Enoch - Glasgow Airport	12	12	6.0	6.0	6.0	
Glasgow Airport - Dalry	26	38	8.9	14.9	17.9	
Dalry - Kilmarnock	34	72	7.2	22.1	28.1	
Kilmarnock - Ayr	29	101	9.5	31.6	40.6	
Glasgow St. Enoch - Glasgow Bellgrove	2	2	5.5	5.5	5.5	
Glasgow Bellgrove - Edinburgh Airport	68	70	17.3	22.8	25.8	
Edinburgh Airport - Haymarket HS	9	79	5.2	28.0	34.0	
Haymarket HS - Edinburgh Waverley	2	81	2.5	30.5	39.5	
Edinburgh Waverley - Newcraighall HS	7	88	4.6	35.1	47.1	
Glasgow Bellgrove - Stirling	41	43	12.8	18.3	21.3	
Stirling - Gleneagles	28	71	9.3	27.6	33.6	
Gleneagles - Perth	22	93	8.1	35.7	44.7	
Stirling - Perth	50	93	13.7	32.0	38.0	
Perth - Dundee Tay Bridge	48	141	13.3	45.3	54.3	
Perth - Coupar Angus	25	118	8.7	40.7	49.7	
Coupar Angus - Forfar	25	143	8.7	49.4	61.4	
Forfar - Bridge of Dun	25	168	8.7	58.1	73.1	
Bridge of Dun - Aberdeen	59	227	15.5	73.7	91.7	
Perth - Aberdeen	134	227	30.5	62.5	71.5	

Note: The service to Dundee stops at Gleneagles; the services to Aberdeen do not.

Edinburgh – Glasgow has 4 stops whereas Glasgow – Edinburgh has only 3 because all Edinburgh's services start at Newcraighall HS (so Waverley itself counts as a stop).

Current fastest time (minutes) from Glasgow [and the above values] to:

•	Edinburgh	48	[40]
•	Stirling	26	[22]
•	Gleneagles	41	[34]
•	Perth	54	[38]
•	Dundee	78	[55]
•	Aberdeen	153	[72]
•	Kilmarnock	37	[28]
•	Ayr	49	[41]



Estimated Journey Times for High Speed Services v1.11



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