HS Transpennine Routes and Service Plans

(HS8 and HS9)

HS8/HS9 Route Mk1A

Following the referendum on EU membership and the decision to disengage from the EU, several changes have been made to the plans for HS rail, most importantly, abandoning GC-gauge, and building all new infrastructure to standard UK loading gauge. This has, in most cases, very little impact on the routes proposed, but significant impact on the service plans. In certain cases it is now proposed to include sections of classic route in the HS route, rather than building exclusively new throughout. (Note that this is different from the previous proposals to run classic compatible services on classic lines, **beyond** the HS route; this actually incorporates classic sections, upgraded as appropriate, in the HS route itself.) Appendix A lists all specific changes of route, for HS8/HS9 and associated routes, principally HS3 and HS7, which are also, of course, incorporated in the various route sections, following. Specific to HS8 is the incorporation of the classic route between Edwalton Junction, (strictly Asfordby Junction, since the section between Edwalton and Asfordby junctions always did incorporate the old Midland route,) and the new (or rather, reinstated) Wymondham Junction, and also that between Peterborough and Ely.

Because of the significant changes introduced at Mk1A, the latest versions of all the Mk1 plans (v6.8 in the case of HS8/HS9) have been preserved, available in an archive section on the website. (For the avoidance of confusion, note that the Mk2 plans for HS8/HS9, below, were written before Mk1A, but of course describe much later developments. They thus appear in v6.8!)

HS8/HS9 Routes Mk2

HS3 Mk2 proposes significant enhancement in capacity, to enable further, desirable services to be run. The transpennine routes HS8 and HS9 are intimately linked with HS3 and also with HS7, and several of the proposed new services use HS8 or HS9 for part of their journey. This causes the capacity of the original design to be exceeded, so further capacity is required. No changes in the routes are necessary, but the section between Broughton and Guide Bridge HS Junctions needs to be 4-track. The only change required to the initial implementation is to make passive provision for this.

As few changes have been made to the existing article as are essential, to cover the new situation. The current document retains all the original Mk1 content, but rearranged to emphasise what is Mk1A and what is now Mk2.

Extra service plans are provided to illustrate the introduction of and the benefits enabled by the 4 track section.

The Purpose, Background and Method

This article refers to and should be read in conjunction with my article ‘Towards a High Speed **Network**’. That article makes the case for developing a network plan for all the HS routes which will eventually be needed, and, as a contribution to getting the discussion started, gave my own thoughts of what such a

network could look like. Naturally, this involves describing a number of routes, in varying but superficial detail. This lays me open to the charge, something on the lines of 'That's all very easy to say, but how would you actually go about doing it?' Accordingly, a decent respect to the opinions of the interested public requires that I should go into more detail on the individual routes. The present article deals with HS8, the Southern Transpennine route, whose core section is from Liverpool and Preston to Sheffield, and HS9, the Northern Transpennine route, whose core section is from Liverpool and Preston to Leeds and York, sharing the route of HS8 west of Guide Bridge.

The general route is decided on strategic and business grounds, thus which locations are to be served. This gives the general alignment, at a very high, superficial level. I plan the detailed route using Ordnance Survey maps, taking careful account of the shape of the landscape, from the contours. I note the location of all significant infrastructure, thus tunnels (generally, over about a quarter mile in length), viaducts and major river crossings. I simultaneously make a virtual tour of the route from my computer, via satellite maps, to make sure, as far as possible, that there is actually room for my lines where I wish to put them, and that, for example, a housing estate has not materialised in an inconvenient location since the (paper) map was published. (I understand that the images used by satellite maps are up to a maximum of three years old, so not exactly real-time, but still pretty good.) I make a great effort to avoid any housing. I'm blasé about demolishing warehouses – after all, all that's required there is to build a (better) new one nearby, and the owners will be very happy. But I regard demolishing housing (or even getting very close to it) as a thoroughly bad idea; people just don't like it, and I understand their feelings. If ever I must (knowingly) propose to demolish housing, I will point out the fact.

In general I try to follow an existing alignment, railway or motorway, (or, very occasionally, of a non-motorway road,) if there is a suitable one available, simply because it's there already, in the right place, with good layout, (somebody else has done all the hard work!) and, except in a very few places, there's plenty of room available adjacent to it. (In this context, motorways are particularly helpful. Nobody wants to live close to one, so house builders don't develop new estates at the side of motorways, leaving plenty of space available for new railways.) Also, most importantly, it minimises disruption, and so I (optimistically, perhaps) expect it to maximise public support and minimise opposition.

When I am following an existing alignment, (this obviously includes taking over the route and trackbed of a former railway, now closed,) I don't generally worry about gradients, confident that they will be well within the capacity of HS trains. Very occasionally, when following a motorway or (more likely) non-motorway road, the contour pattern suggests that there might be a problem, and then I do check the gradients, (and state what these are, in the route plan). When I am obliged to design a completely new alignment, then the gradient profile forms part of the design, and will be stated, (unless, from the contours, it's obviously essentially level, or undulating but with no significant underlying change of level). HS8 has an entirely new alignment across the Pennines between Glossop and Sheffield, and between Ladybower and Huddersfield; complete gradient profiles are provided. (It likewise has a largely new alignment between near Melton Mowbray and Ely, but this is essentially level.) For HS9, an alternative route is offered on an entirely new alignment approaching Huddersfield, also the section between Huddersfield and Leeds has a largely new alignment; gradient profiles are provided.

I believe that this approach gives a route which in general terms is practicable and satisfies the requirements, though obviously a lot of work, especially detailed surveying on the ground, would be needed to turn it into an implementable design. Specifically, I can say nothing about cuttings and embankments, though I may note that a particular piece of landscape is strongly undulating, so cuttings and embankments will be required. Also, when I take the route alongside an existing railway or motorway

alignment, I don't attempt to design it in any detail around (particularly motorway) junctions, although I do note on which side it runs, and wherever it is necessary to cross over to the other side.

The Maps

Naturally, the chosen route must be illustrated with maps. I briefly describe the route, giving the map reference of all significant points (invariably of tunnel end points and significant river bridges), but the accompanying maps are the real definition. Mapping software can be very expensive, but fortunately the Ordnance Survey makes available, free of charge, the OS OpenData product suite, of which I use two components, the 1:250000 Scale Colour Raster data set and the Strategi Dataset. The former comes as a set of TIFF files, each containing one of the standard National Grid 100km Reference squares. These are easily converted into Microsoft Paint files and edited. These are, in other words, pure graphics, and are the basis of the detailed maps in the 'Route' section. The maps reproduced in the text all represent an area 20km in width (unless noted otherwise) and 10 km high (if the detail I wish to show will fit within that, but otherwise as high as necessary). They do actually contain contours, but not many; the scale is too small for contours to be really informative. For the present purposes, this scale is adequate; if you need more detail, use them as an index to the corresponding 1:50000 Landranger or 1:25000 Explorer maps.

The Strategi Dataset contains GIS (Geographical Information Systems) data, which has to be processed by special software; I have used the Open Source QGIS product. This has been used to produce an overall map of HS8/HS9, including sections of other routes over which HS8/HS9's services run. These overall maps come at the end of the 'Route' description, and also show HS8/HS9's classic compatible services on classic lines (these are shown as dotted lines). Also included there are maps of the overall HS Network.

In all the maps I use the following colour scheme for the various routes:

As the various route plans have been developed, the maps have been updated, so now they show all routes, as relevant. The maps in the present article are thus not limited to HS8/HS9.

The Service Plans

The Route section of this document describes the complete lines in their final, full configuration (as far ahead as the plans consider). The service plans explain how that final state is reached: the order in which sections are opened, and the services which run on these partial configurations. The aim is always to get useful services running as soon as possible, to maximise return on the investment.

The service plans deliberately envisage maximum frequencies, to give an impression of just how much the system **could** accommodate. Initial services would certainly not be so intensive, probably no more than half of the frequencies quoted.

A standard HS station has two island platforms, thus two platformed tracks in each direction. If some of the services passing through the station are non-stop, then the main line must pass through the layout without adjacent platforms, either through the centre of the alignment, in tunnel below or on viaduct above, or the station must be on a branch loop off the main line, which thus bypasses it completely. In fact, all HS8/HS9 stations are served by all services, so don't need overtaking/avoiding lines.

The point of insisting on two platforms in each direction is **either** to enable cross-platform interchange between different services, (both HS or HS and RM,) **or** to maximise capacity, (especially when all services stop at the station,) by allowing a second train to arrive at the station before the preceding train has departed. (It also promotes resilience, if a failing train can make it at least as far as the next station, to be taken out of service.)

Several service plans are developed, reflecting the piecemeal development of the network. As new sections open, further services come into operation. In all cases, consideration is given to maximum loadings – which section(s) are fully loaded and thus determine the maximum service frequencies. I used to take 16tph as the maximum throughput, but, following new capacity calculations (expounded in appendix B of the article 'Same Speed Railways', which do include the effect of junctions,) I am now considerably more relaxed on this, and will countenance loadings of up to 24tph. (The quoted appendix contains my justification for this choice.) As stated above, the service plans deliberately quote maximum frequencies; initial services will almost certainly be to lower frequencies.

Two types of services are contained in the plans, those featuring High Speed trains, which travel on HS8/HS9 for at least part of their journey, and those featuring Regional Metro (semi-fast) services on the corresponding classic route(s). Connections between the services (both HS and RM) are shown for the relevant interchange stations (the connections are usually cross-platform), together with the clock-face hourly departure plan. (Note that these plans are **representative**; the **actual** times are determined by the coordination of interchanges at multiple locations).

It is important always to bear in mind that the HS network is **not** a separate, stand-alone system, but an integral part of the complete railway network, hence the importance I attach to showing precisely how HS services interact with classic (RM) ones. (In this context it is worth pointing out that if, when HS lines come into service, the current ridiculous and illogical franchising system is still in operation, it will be necessary to include the corresponding classic route(s) in the same franchise as a HS route, with a strict

contractual obligation on the franchisee to ensure close integration of HS and classic services. It certainly won't happen otherwise.)

Estimated Journey Times

Following the service plans, estimated journey times are produced for all HS services. The assumptions and approximations made are explained.

HS8/HS9 Route – Introduction and Assumptions

HS8 follows classic alignments much of the way in Lancashire, but from Glossop to Sheffield, together with the Huddersfield branch and the crossing of Manchester, the alignments are completely new.

Two route versions are provided for HS9 between Guide Bridge and Huddersfield, using existing alignments and a largely new alignment. The original route was 4 track throughout, and HS9 could readily use two tracks, but it wouldn't be particularly high speed; it would on the other hand be much cheaper than a completely new route. Between Huddersfield and Leeds, a completely new alignment (though in some parts using old alignments) is proposed in either case.

The maximum speed for HS8 and HS9 is 300kph, 187.5mph, throughout; the non-stop runs are not long enough to take advantage of a higher speed, and 300kph is adequate, with no detriment to the service provided, and with significant savings in construction costs. A higher line speed, of 360kph applies where Hs8/HS9 share route with HS3, thus (HS8) between Wales Junction and Nottingham, and, (HS9) between Leeds HS and Ulleskelf Junction, and between Romanby Junction and Darlington. 360kph also applies where HS8/HS9 jointly share route with HS2, between Liverpool and Kenyon Junctions, and between Preston and Bamfurlong. It also applies between bot Kenyon West Junction, Gibb Farm Juncton and Broughton Junction, though these latter two sections are HS8, but shared by HS3 services. HS8 and HS9 in their entirety have the characteristics of a HS metro.

The original (Mk1) design resulted in the conclusion that the section of HS8 between Edwalton Junction and Peterborough had loadings (4tph between Edwalton and Thursby junctions, and 8tph between Thursvby Junction and Peterborough) which are insufficient to justify dedicated HS infrastructure. Accordingly, at Mk1A, the section is now merged with classic tracks between Edwalton Junction and Wymondham West Junction, via Melton Mowbray, and between Pellett Hall Junction and Peterborough ECML (Midland platforms). The section between Peterborough and Ely is likewise merged with the classic tracks at Mk1A.The line speed o the entire Edwalton Junction – Ely section is built or enhanced as necessasy for a line speed of 225kph; not really high speed. The section of HS8 between Sheffield HS and Waleswood Junction likewise has a line speed of 225kph; this is merged with the classic tracks from Sheffield Midland to Retford and on to Gainsborough, between Woodburn HS and Waleswood Junctions.

At Mk2, the HS8 new infrastructure between Asfordby and Wymondham East junctions, between Pellett Hall Junction and the new Peterborough HS platforms, and between Peterborough HS and Ely, via Wimblington, are restored. The latter two have adequate loadings to justify the investment, but the former still has only one HS8 and one HS7 service, thus 4tph. Accordingly, since this section follows part of the trunk freight route from Felixstowe to the West Midlands, it is opened up to express freight traffic (a new

development in the HS network proposals!), and therefore a further junction is added, Melton HS, to allow freight traffic, having bypassed Melton Mowbray, to diverge from HS8 and join the Melton – Leicester line..

HS8 Route – Junctions

There are various junctions on the route of HS8, enabling connections with other HS and classic routes. These are identified in the description of the route, but it is convenient to list them all here, together with their map references and identifying remarks, since, when discussing the capacity/loading of different sections of route, the end points are usually junctions (occasionally stations). The junction names are my own suggestions.

- Gibb Farm SD627107 Connection to HS2 diverges (joins HS2 at Bamfurlong Junction, and enables HS services between Preston and London).
- Bamfurlong SD600016 HS8 joins HS2, as noted above.
- Kenyon West SJ628961 Connections to HS2 diverge (joins HS2 at Kenyon South Junction enabling HS services between Liverpool and London, and at Kenyon North Junction, enabling HS services between Liverpool and Scotland).
- Kenyon South SJ639955 Connection from HS8 and Liverpool joins HS2 main line to south.
- Kenyon North SJ634968 Connection from HS8 and Liverpool joins HS2 main line to north.
- Broughton SJ826994 Preston branch joins main line (underground).
- Guide Bridge HS SJ928975 HS9 diverges from HS8.
- Ladybower SK201864 Huddersfield branch joins main line.
- Woodburn HS SK370878 HS8 joins the classic route to Retford.
- Waleswood SK469839 HS8 diverges from classic route.
- Wales SK474835 HS8 joins HS3
- Nuthall North SK514469 HS7 diverges from HS3.
- Nuthall South SK509425 Nottingham branch diverges from HS3 main line (*).
- Strelley SK512423 Connects HS7 to HS3 Nottingham branch (*).
- Manvers St. SK588393 HS3 Nottingham branch diverges from classic route east of Nottingham station (*).
- Edwalton SK601347 HS8 diverges from HS3 Nottingham branch.
- Asfordby (Mk2 only) SK711199 Classic route to Melton Mowbray diverges from HS8.
- Melton HS SK735180 Freight connection from Leicester – Melton line joins HS8.
- Wymondham West SK820191 HS8 diverges from classic route via Melton Mowbray. This is the original Wymondham Junction, now renamed West, where the long-closed line from Saxby to Bourne diverged. The route of this is ` incorporated in HS8.
- Wymondham East (Mk2 only) SK830187 HS8 at Mk2 joins the Saxilby – Bourne route.

- Thurlby TF084168 HS10 joins HS8.
- Pellett Hall TF132055 HS8 joins the classic ECML. Initially it just joins the Midland tracks. There is also a southbound connection from the ECML. (The northbound connection to the ECML is slightly to the north-west, at the existing Helpston Junction.)
  (See Appendix B for a proposed layout at Pellett Hall.)
- Ely HS South TL562812 HS8 at Mk2 joins HS6 into Ely station

(*) These junctions are on HS3, on the section shared with HS8, but appear in the route loading tables.

There are various other links between HS8 and classic lines, for operational purposes and not intended for regular services, so not relevant in the present context.

HS9 Route – Junctions

Likewise for HS9:

- Guide Bridge HS SJ928975 HS9 diverges from HS8.
- Paddock SE124161 HS8 branch from Ladybower Junction joins HS9.
- Gelderd Rd. North SE282322 HS3 joins HS9 west of Leeds New Lane station.
- Garforth West SE387342 Spur to HS3 diverges from HS9.
- Garforth East SE395341 Spur from HS9 joins HS3 main line to York.
- Micklefield HS SE439327 HS9 joins classic route to York at relocated and expanded Micklefield station.

There are various other links between HS8/HS9 and classic lines, for operational purposes and not intended for regular services, so not relevant in the present context.

There now follows the definition of the actual route, in several logical sections.

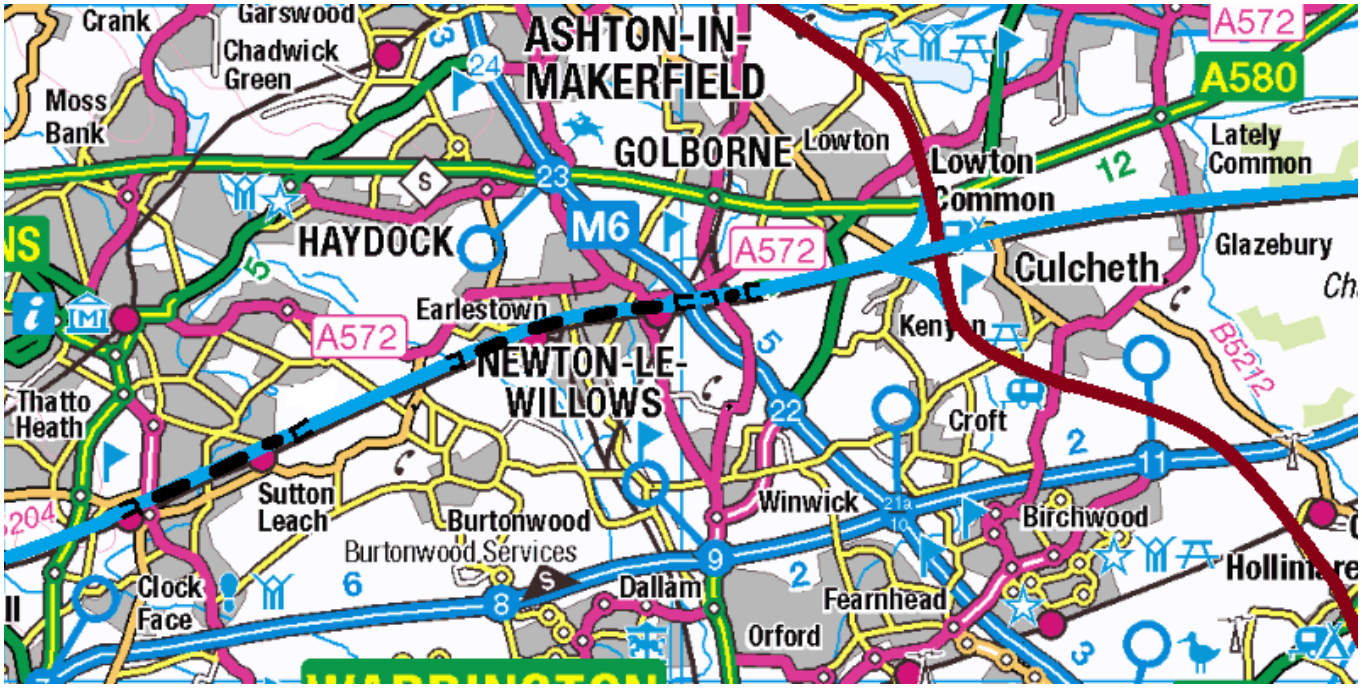
1. *HS8 Liverpool – Manchester*

HS8 begins at Liverpool Lime Street station, with 3 new HS island platforms (6 faces) on the north side of the existing station. (4 islands – 8 faces – would be even better, if there's room.) The area between the station and Lord Nelson St. seems ripe for redevelopment – a lot of it is car parks, and there are a couple of office buildings which could be replaced by office development above the HS station.

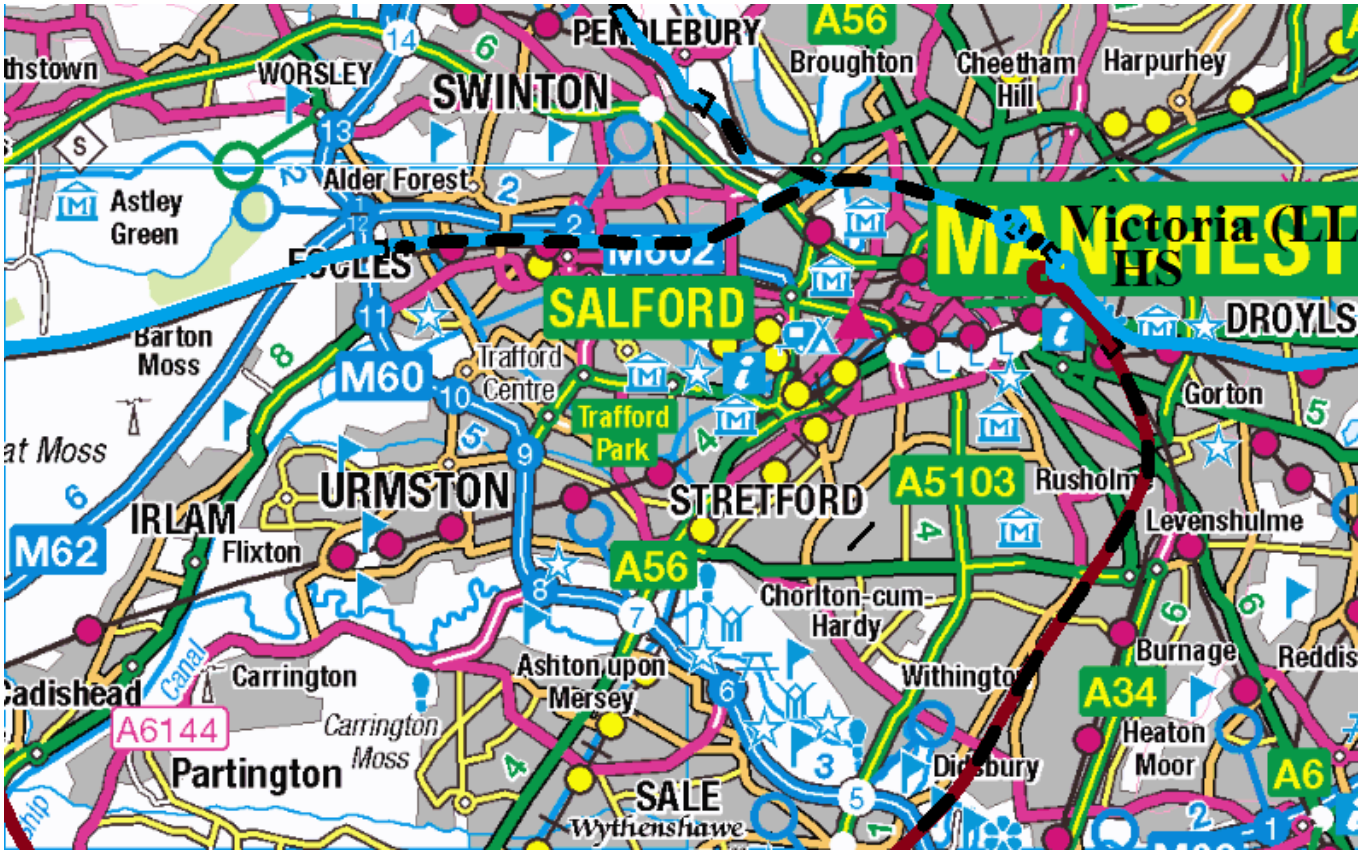
1.1 Liverpool – Rainhill Contains Ordnance Survey data © Crown copyright and database right 2013

The route starts in an easterly and slightly northerly direction for a short distance, until it meets the disused Waterloo tunnel, which it takes over (enlarged as necessary) and thus reaches Edge Hill. It then follows the north side of the alignment of the Chat Moss route all the way to Manchester (Patricroft, actually). There were originally 4 tracks out as far as Huyton. The HS tracks will have to climb over the junctions for the docks branch in Olive Mount cutting. A ¾ mile tunnel under Broad Green station is required between SJ399903 and SJ410903, to avoid housing. Further tunnels are required under Whiston and Rainhill, 2½ miles between SJ454908 and SJ496915, under St. Helens Junction, 2 miles between SJ518924 and SJ540932, and under Newton le Willows, 2 miles between SJ570948 and SJ598953, for the same reason. A further short tunnel (½ mile) or cutting passes under Parkside East and West Junctions. At Kenyon West Junction, SJ628961, spurs link to HS2, at Kenyon South and North Junctions, allowing HS services between Liverpool and London and classic-compatible to Scotland. There is nothing further of note until Patricroft. At SJ754987 HS8 enters a 5½ mile tunnel to Manchester HS station, curving gently to the north to Broughton (underground) Junction, at SJ826994, where the line from Preston joins, following the arc of the Irwell round to Manchester Victoria (Low Level), at right

angles to the surface station, then under Shudehill, Thomas St. and Dale St., and under the Rochdale canal.



1.2 St. Helens Junction – Glazebury Contains Ordnance Survey data © Crown copyright and database right 2013



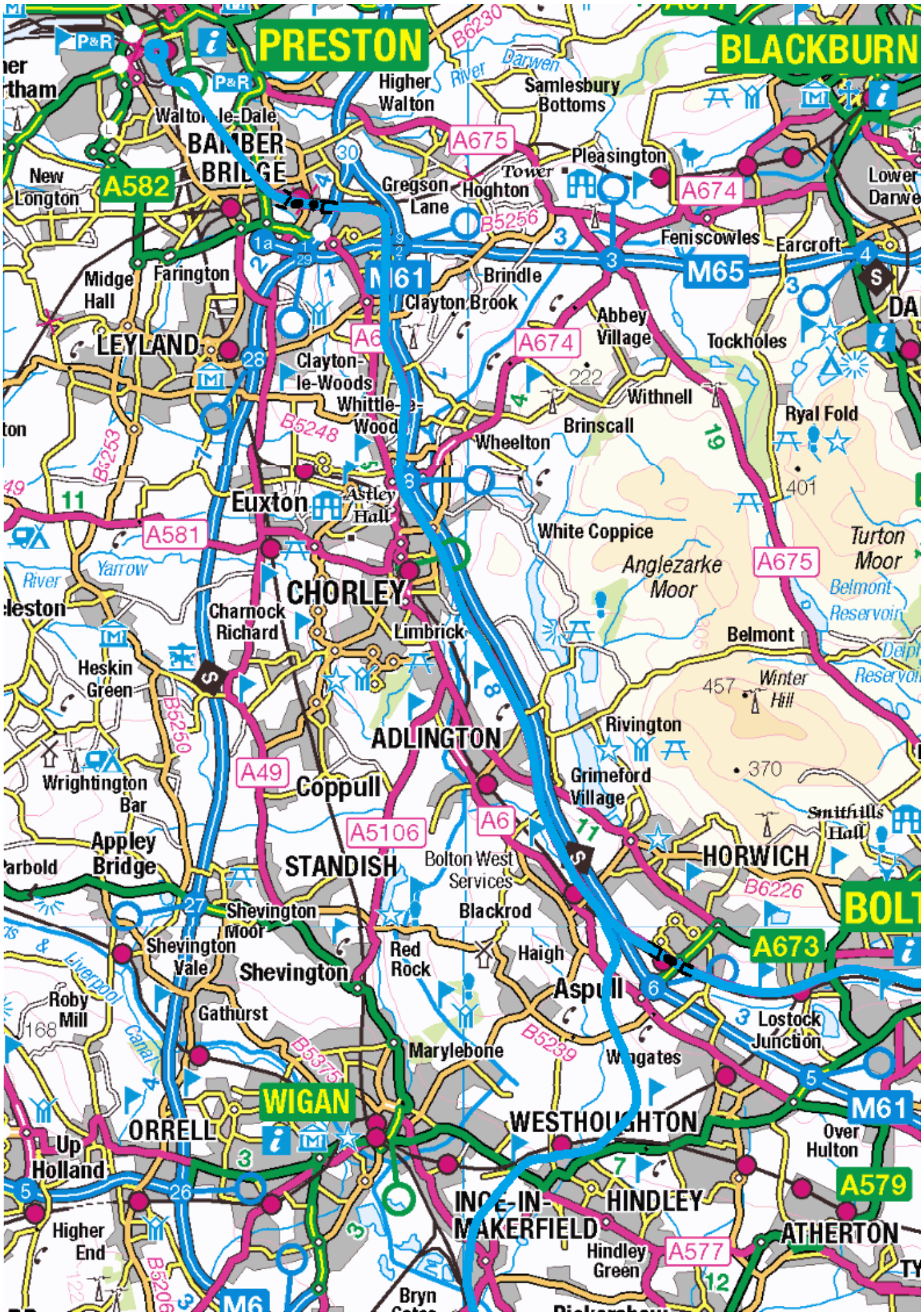
1.3/2.3 Chat Moss – Manchester Contains Ordnance Survey data © Crown copyright and database right 2013

2. HS8 Preston – Manchester, including Connection to HS2

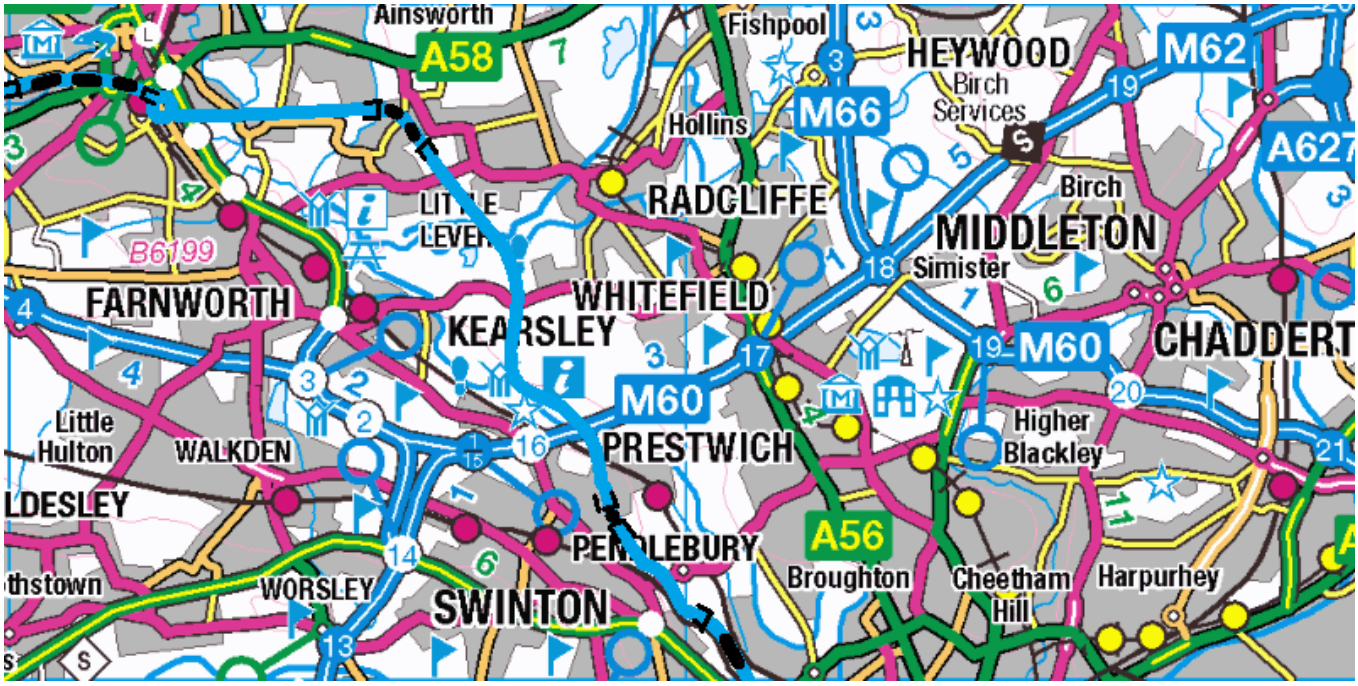
There is a currently disused (for passenger traffic) island platform on the west side of Preston station, and room for another beyond that. This is the obvious place to locate the HS platforms. The existing viaduct over the Ribble has a section on the west side currently only partly used – one track is in place across it, with room for two; again, just right for the HS tracks (the rest of the bridge already having 4 tracks). HS8 diverges from the WCML alignment immediately south of the Ribble Viaduct, at SD535282, and curves round to pass under the WCML using the existing former alignment at SD535278, and following this round to join the north side of the alignment of the current line from Preston to Blackburn, before Bamber Bridge. It tunnels under Bamber Bridge station, from SD563258, emerging ½ mile later on the south side of the alignment at SD570257. This it follows to SD580257 where it diverges to join the west side of the alignment of the M61 motorway at SD584254. This it follows all the way to Horwich, encountering no obstructions. There are a number of new housing developments along the way, but they all very conveniently keep well clear of the motorway (perhaps noise screens may be appropriate in some locations). At Horwich, HS8 diverges from the M61 at SD627107, Gibb Farm Junction, where the branch to HS2 south of Wigan diverges (see later), and joins the north side of the alignment of the Preston – Bolton line at SD630100. A short tunnel is needed under Horwich Parkway station (since the station buildings and car park are on this side. After which there are no further obstructions until SD700086, where it enters a 1 mile tunnel to Bolton station. There is a large space on the east side of the station, between the station and the Manchester Rd., currently occupied by a supermarket or some other retail outlet which would provide an ideal location for the HS platforms; some mutually advantageous arrangement could doubtless be reached.

The HS2 branch diverges at Gibb Farm Junction, and continues alongside the M61 alignment until that crosses the Preston – Bolton classic line, and HS8 also, at SD633098. It then itself diverges from the M61, and takes over the trackbed of a long disused line from Horwich Fork Junction to Hindley (Crow Nest Junction). The only obstruction on this entire section occurs as SD630090, where is crosses the A6. A hotel has been built at precisely that point. However, by slewing the alignment few yards to the south east, there is a space for it to cross the A6 at SD632089. It crosses just west of Crow Nest Junction, at SD628053, and follows the south side of the alignment of the line past Hindley station, diverging at SD607047, immediately after crossing the A577. From here, a new alignment crosses Amberswood Common, crossing the A573 at SD600032, finally joining the east side of the WCML alignment at SD597028, continuing along that until it meets the HS2 Wigan arm at Bamfurlong Junction.

From Bolton, HS8 follows the trackbed of the former Bury line to SD753083, where it enters a ½ mile tunnel, curving to the south and emerging at SD760080, on a new alignment. It crosses the A6053 at SD766075, passing Harper Fold at SD769072, crossing the Manchester, Bolton and Bury canal at SD773068 and the Irwell at SD773067, and joining the alignment and taking over the trackbed of the former line from Radcliffe Junction to Clifton Junction and Patricroft, at SD775060. It follows this route a little way past Clifton Junction (crossing over the classic line from Bolton to Manchester), diverging at SD794023 and passing under Pendlebury in a ¼ mile tunnel between SD797015 and SD798013, joining the east side of the Wigan – Salford alignment for a short distance and diverging at SD806006 and entering a 1½ mile tunnel to Broughton (underground) Junction, where it joins the HS8 line from Liverpool.



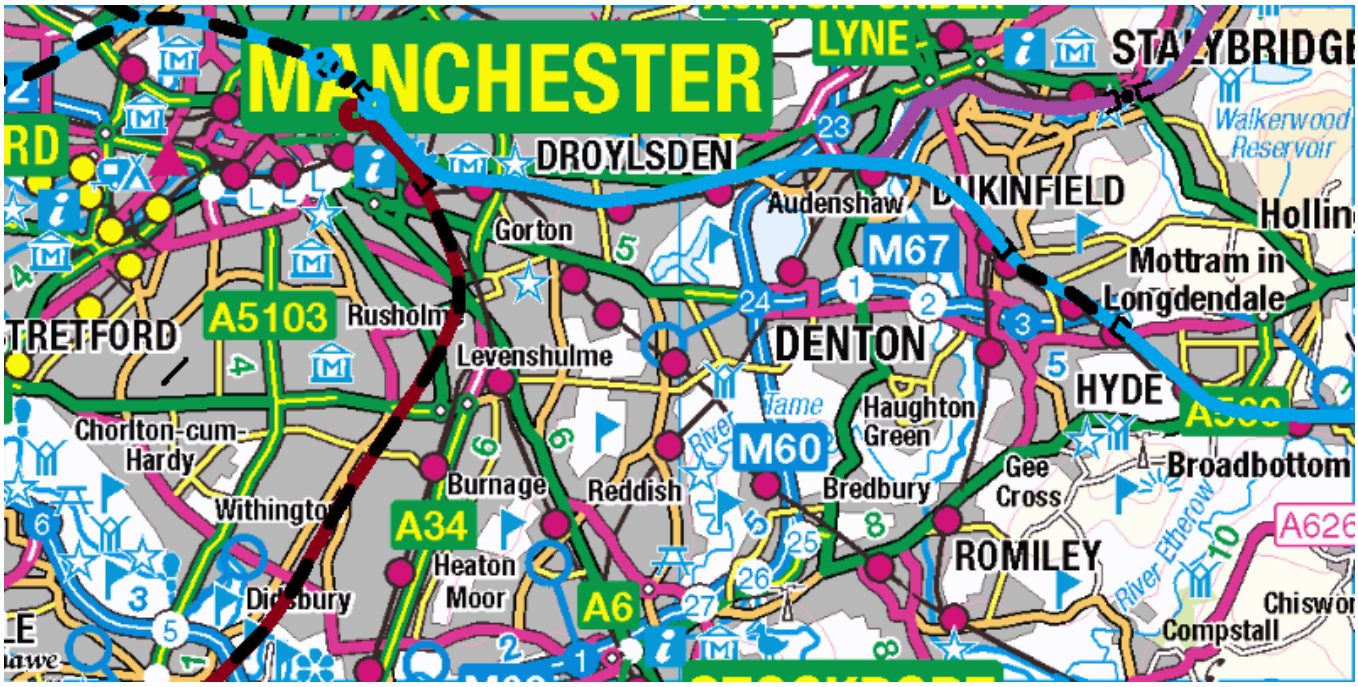
2.1 Preston – Bolton / Haigh – HS2 branch



2.2 Bolton – Pendlebury Contains Ordnance Survey data © Crown copyright and database right 2013

3. *HS8 Manchester – Wales Junction*

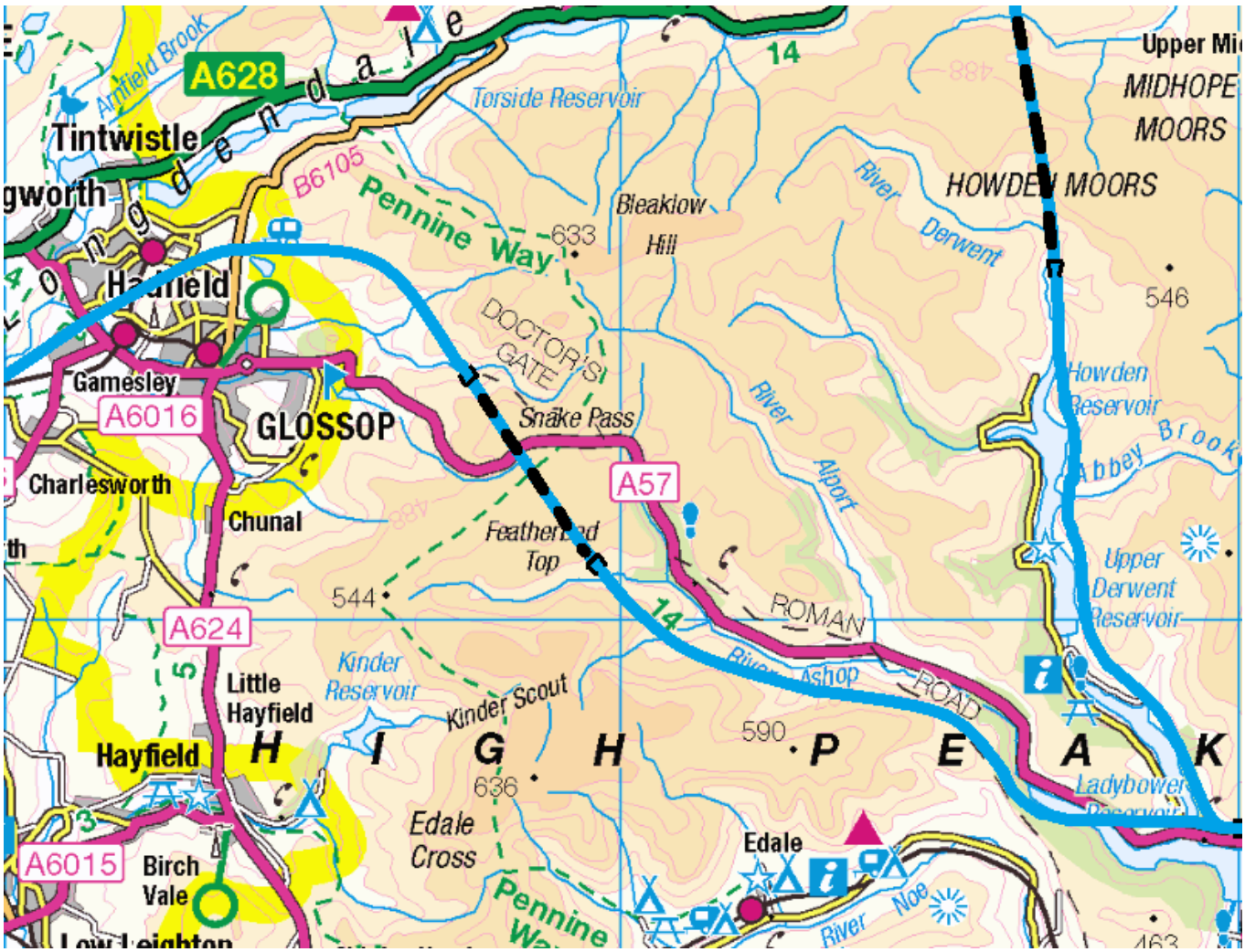
HS8 leaves Manchester HS station and follows the north side of the alignment of the Woodhead route. This originally had 4 tracks as far as Hyde North. At Guide Bridge HS Junction (SJ928975) HS9 diverges for Huddersfield and Leeds. From Hyde North to Godley a 1½ mile tunnel is required, between SJ945964 and SJ964951. HS8 diverges from the Woodhead route at SJ994938, immediately before the Etherow viaduct, passing over the Etherow and Dinting Vale, and crossing the Woodhead route at Dinting station.



3.1 Manchester – Broadbottom Contains Ordnance Survey data © Crown copyright and database right 2013

From Higher Dinting (SK023949, 600ft altitude) HS8 climbs to the 750ft contour near Old Glossop (SK045958), 150ft in 1½ miles – 1 in 53. The route ascends along the side of the hill, reaching the

entrance to the Snake Pass Tunnel, altitude 1000ft, at SK076941, 250ft in 2¼ miles – 1 in 47. The Snake Pass Tunnel is 2¼ miles long, emerging at SK093907, altitude 1250ft, 250ft in 2¼ miles – 1 in 47. This is the summit of the line. It descends Ashop Clough, turning right opposite the Snake Inn, then descends along the south side of Woodlands Valley to reach the 750ft contour at SK176867, 500ft in 6 miles – 1 in 63.



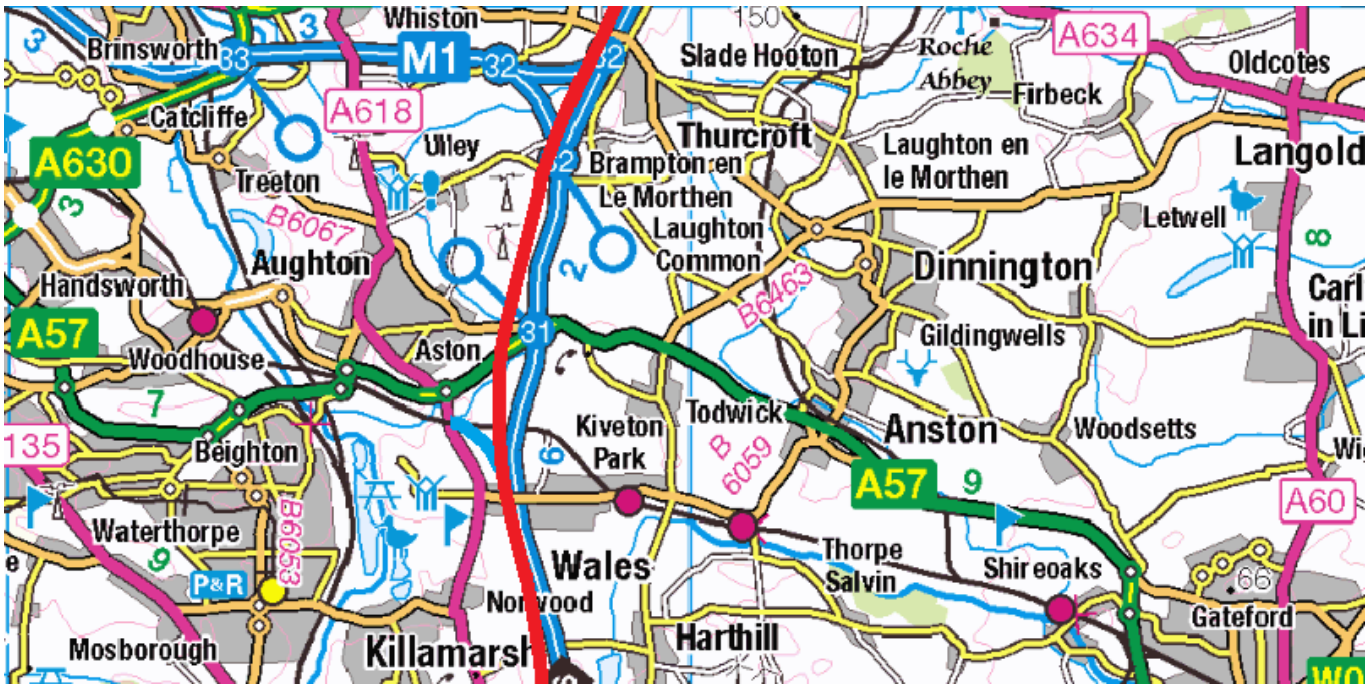
3.2/7.1 Glossop – Ladybower Junction Contains Ordnance Survey data © Crown copyright and database right 2013

It holds to the 750ft contour, or to that height in tunnel, for the next 6 miles. From SK176867 it crosses to the north bank of the reservoir at SK180867, which it follows to SK190866, where it crosses the north arm of the reservoir, alongside the road bridge. At Ladybower Junction (SK201864), the branch from Huddersfield merges, and immediately afterwards the route enters a 4 mile tunnel under Hallam Moors, emerging at SK267872, still at 750ft. The route now resumes its descent, past the Rivelin Dams, to SK300872, altitude 500ft, 250ft in 2 miles – 1 in 42. Here it enters a 3 mile tunnel under Sheffield, emerging (after a sharp left-hand curve) at SK359866, immediately to the south of Sheffield HS station, at an altitude of 200ft, 300ft in 3 miles – 1 in 53. Immediately before emerging, it has to pass below the classic Midland tracks, and also the former diveunder where the line from London passed below the Hope Valley tracks (just in case we need it in the future).

Sheffield HS station is immediately behind (to the east of) and above the existing Midland station (at the level of the current Supertram alignment), at the bottom of Park Hill. There are minor variations in position possible, determining precisely how much excavation of Park Hill is required and how heavy the retaining walls. My preferred solution has it extending partly over the eastern island platform of Midland

3.3 Ladybower – Sheffield Contains Ordnance Survey data © Crown copyright and database right 2013

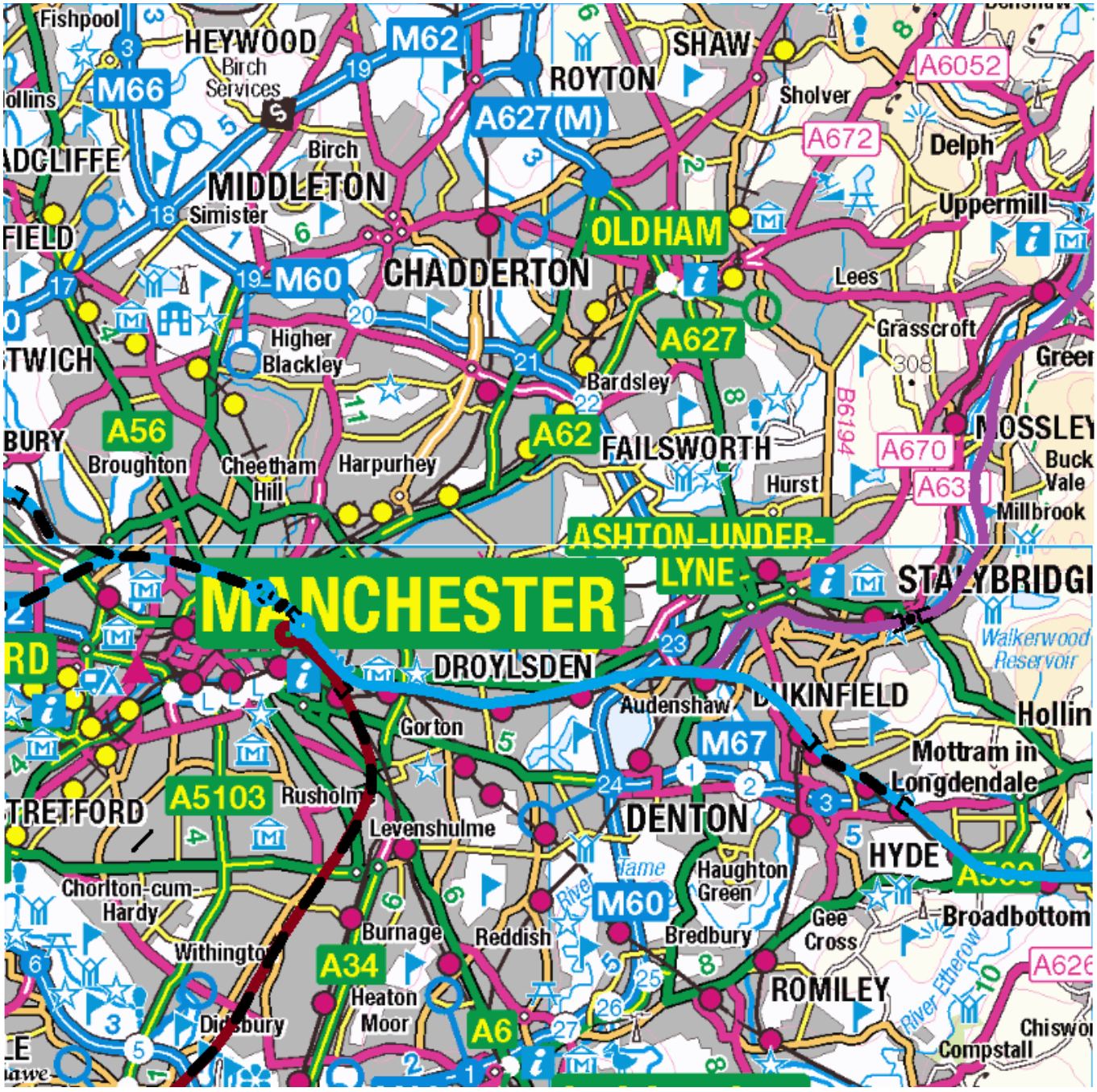
station, (platform 6 and 8, and bay 7,) involving more structural work but less excavation. To the north of the station, HS8 is in cutting following closely the classic route, but at a higher level. It joins and merges with the alignment of the classic line to Retford at Woodburn HS Junction, SK370878, and follows that all the way to Waleswood Junction, SK469839, where it diverges from the Retford line, and joins HS3 at Wales Junction, SK474835. (HS8 services from Liverpool and Preston to Hull and Cleethorpes, continue along the Retford route on to Gainsborough, where they join HS10.).



3.4 Handsworth – Killamarsh Contains Ordnance Survey data © Crown copyright and database right 2013

4. *HS9 Guide Bridge HS Junction – Huddersfield*

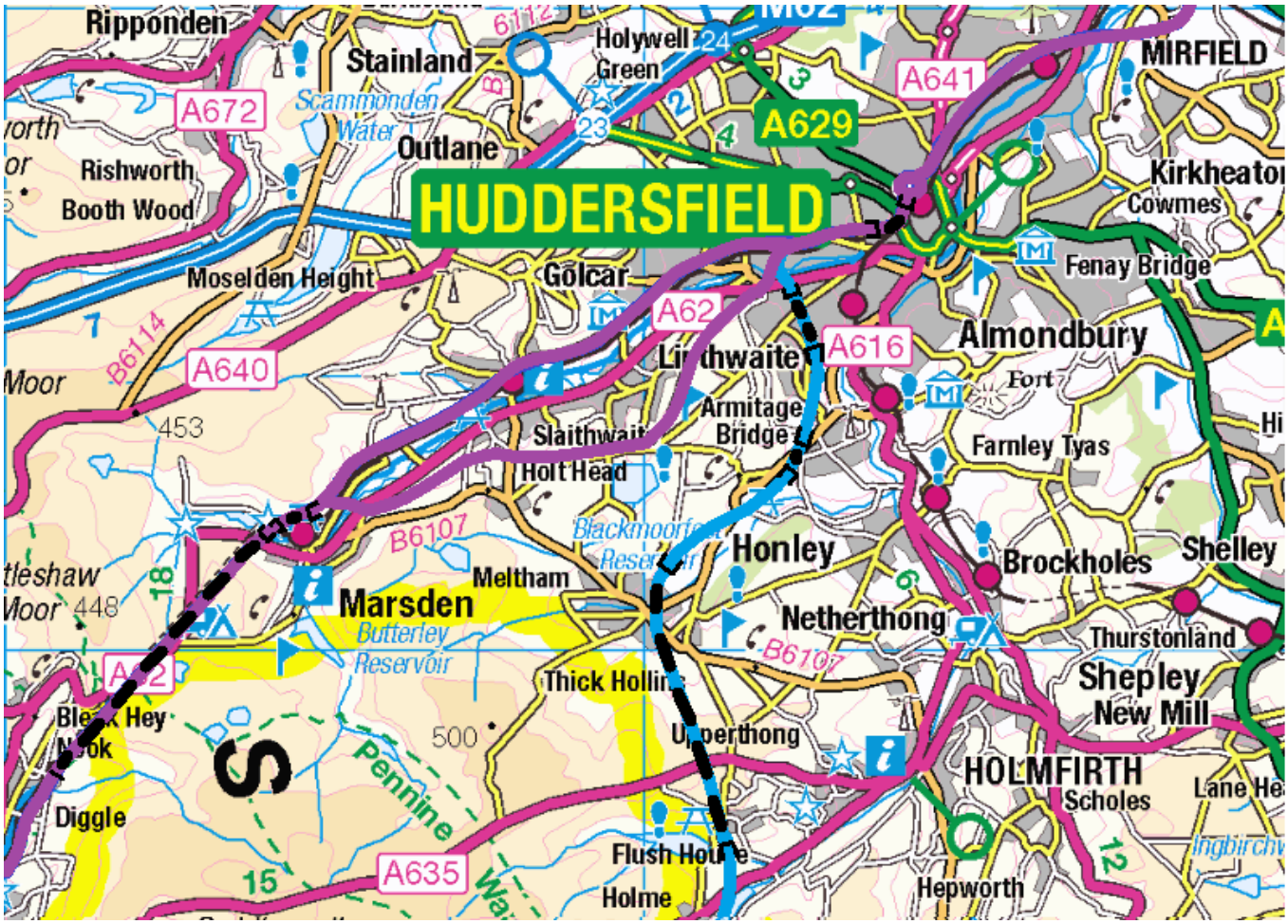
HS9 diverges from HS8 at Guide Bridge HS Junction (SJ928975) and follows the alignment of the line to Stalybridge, initially on the north / west side, switching to the south side at SJ938985. It passes on the south side of Stalybridge station, then takes the currently disused southern tunnel immediately east of the station, enlarged as necessary, and follows the trackbed of the currently disused eastern alignment up to Diggle.



4.1 Manchester – Greenfield

Between Stalybridge and Diggle, two viaducts are missing, in Stalybridge and in Mossley, and will have to be rebuilt. The route is otherwise unobstructed. Various overbridges will have to be rebuilt. The two original single bores of Standedge tunnel will need to be renovated and possibly enlarged.

An alternative is a 1¾ mile tunnel under Mossley, between SD976002 and SD981028. This straightens out several curves and avoids having to rebuild the viaduct at Mossley; it is on a gradient of 1 in 92. This is highly recommended.



4.2/5.1 Diggle – Mirfield

Between Marsden and Huddersfield there are likewise no obstructions. The HS lines occupy the north / west side of the alignment, except that, using the original tunnels, they emerge at Marsden on the wrong side. The first requirement is thus a flyover for the HS tracks, which cross the classic tracks and enter a short, ½ mile tunnel at SE043119, emerging at SE052122, and joining the northern side of the alignment at SE053126. This circumvents the housing to the north of Marsden station. The classic tracks will need to be slewed at various locations, where they have been laid to take advantage of a 4-track alignment. The overbridges will generally need to be enlarged – in fact there aren't many; I count 11, many of which can probably be demolished and not replaced. The tunnels into Huddersfield station present more of a problem.

An alternative alignment between Marsden and Huddersfield (shown on the map) diverges from the above immediately on leaving the short tunnel behind Marsden station at SE052122, and crosses the valley to SE057123, then follows roughly the 700ft contour to SE097135, above Clough and Linthwaite. A couple of short viaducts will be needed in this section across side valleys. From this point there is a superb, clear descent along the hillside, right down to the valley floor, gently curving, completely unobstructed and requiring no tunnel. At the bottom it crosses the A62 at SE123157, at altitude 400ft, 300ft in 2¼ miles – 1 in 40. It crosses the valley floor, under the classic route and joins it on the north side of the alignment at Paddock Junction (SE124161), and into Huddersfield station, as above.

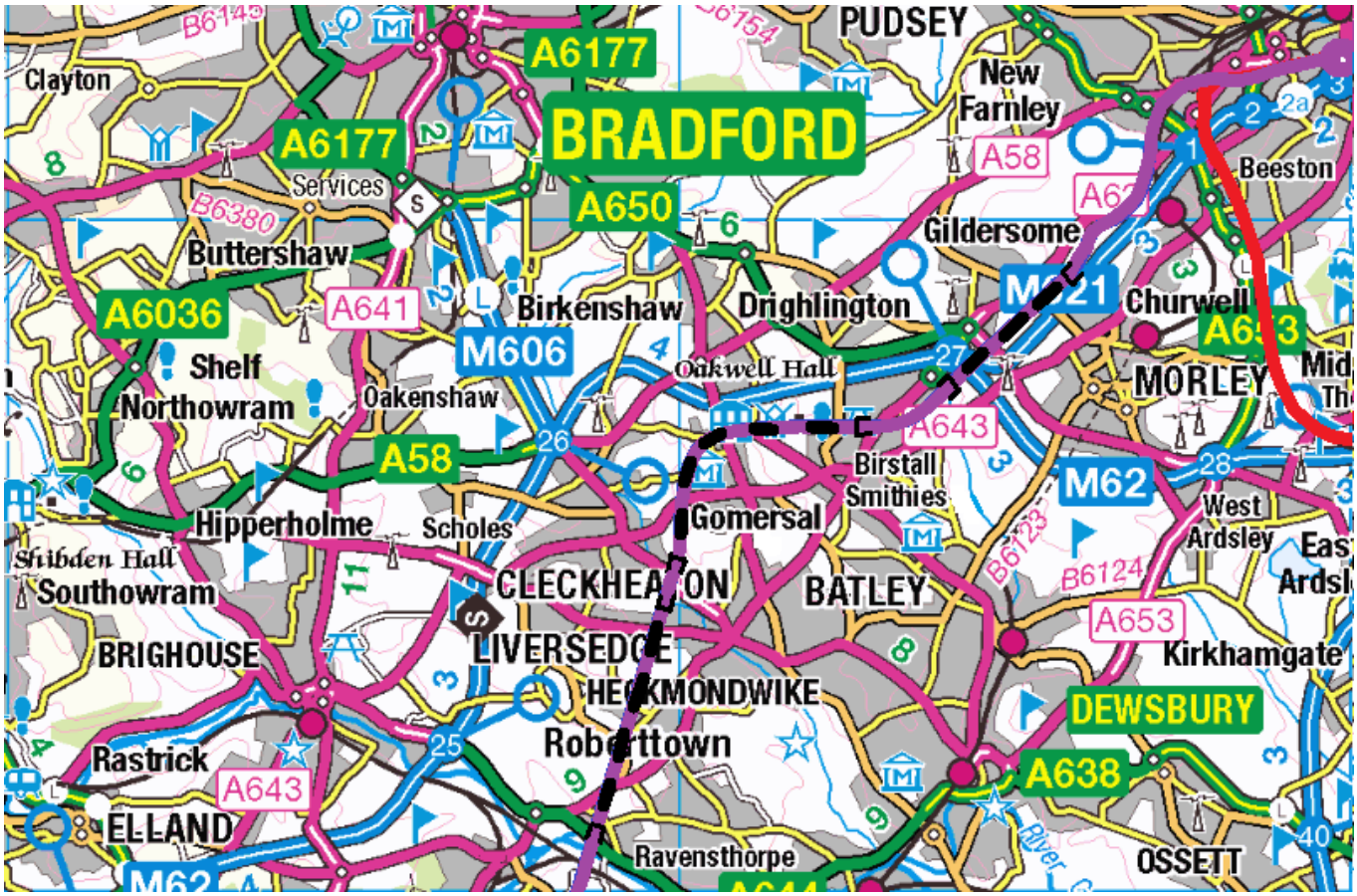
(If local passenger traffic develops satisfactorily from Huddersfield up to Marsden – Colne Valley Metro? – there could well be justification for both routes.)

There's plenty of room behind Huddersfield station for two HS island platforms, currently used for parking (a multi-storey will need to be relocated).

5. *HS9 Huddersfield – Leeds*

This is a completely new alignment, but some parts use sections of old, closed alignments.

From Huddersfield to the Calder Valley the route was also 4 track. HS9 continues on the North / West side of the existing alignment for the first 2 miles, to SE162190, where it diverges to the left taking over the alignment of the old Midland Huddersfield branch. This climbs and crosses the existing line, and HS9 follows the route only to SE183202 from where it crosses the Calder Valley on a viaduct to Battye Ford, at SE188207. The altitude is 250ft. HS9 enters a 2½ mile tunnel at SE188207, emerging at SE196245, in Heckmondwike, still at 250ft, so this last section has been completely level. It crosses the A638 at SE197248, and enters a further tunnel at SE198250, from which it emerges at SE225268, in Birstall, where it joins and takes over the alignment of the former Leeds New Line, and follows that to Leeds. This tunnel is 2 miles by crow-length, but on a wide curve, to keep it underground, so probably 2¼ miles. It climbs 250ft in this distance so a crow-gradient of 1 in 42, and an actual one of about 1 in 47. The section of Leeds New Line has no obstructions, and very conveniently itself has a tunnel, which takes it underneath an extensive motorway junction which would otherwise have obliterated it.



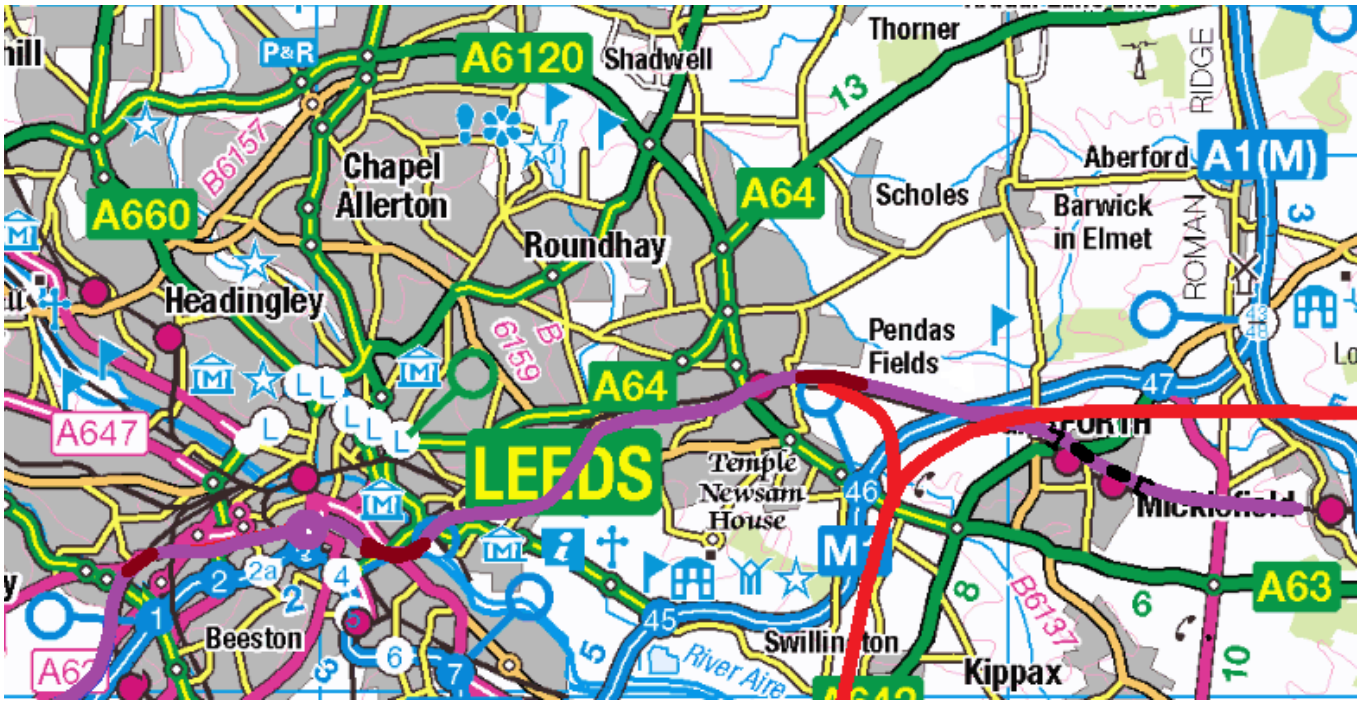
5.2 Ravensthorpe – Leeds

This route crosses a complicated and quite densely populated area, without encountering a single obstruction. My first idea was a single (straight) tunnel from Battye Ford to Copley Hill, joining the Leeds New Line a mile or so closer to Leeds. But on examining the contours, I found there are a couple of quite deep valleys in the way. The line has to emerge for a short distance in Cleckheaton, but manages to stay underground the rest of the way. (My original route would indeed be possible, but at the cost of a couple of quite major viaducts, which I tend to avoid unless they're completely inevitable.)

7. Leeds New Lane – Micklefield

This is actually, as far as Garforth, a very early instalment of HS9, provided in advance of all the rest to allow services initially terminating at Leeds to proceed on to York, and terminate there. It also allows HS7 services to York and Newcastle to travel via Leeds, instead of proceeding directly to York.

I propose an unashamedly grandiose design to get across Leeds. New Lane Station is an elevated structure, with a long approach viaduct. The continuation (as HS9) eastward continues on viaduct, first along the south side of Great Wilson Street (A653) then Hunslet Lane (A61) and later Hunslet Road. From SE304328 the route crosses, still on viaduct, into the centre of the A61 dual carriageway (there's plenty of room between the carriageways) as far as SE309323, then turning east (it's still the A61), still on viaduct along the centreline. It crosses to the north side of the road when the South Accommodation Road comes in on a flyover. It crosses to the south side of the road just after the river bridge (at SE315324), and finally descends to ground level, to join the Hunslet East branch at SE316325, following this round to join the south side of the Leeds and Selby line at Neville Hill. This all sounds very extensive, but in fact it's barely a mile from New Lane station to joining the Hunslet East branch. The area traversed is warehousing / industrial, emphatically not residential, and has experienced a lot of new road building in recent years, so clearly it is not regarded as environmentally sensitive! I think that New Lane station and its approach from the west will be a splendid enhancement for Leeds, and this magnificent eastern approach even more so. I don't often make spectacular proposals, but this is definitely one.



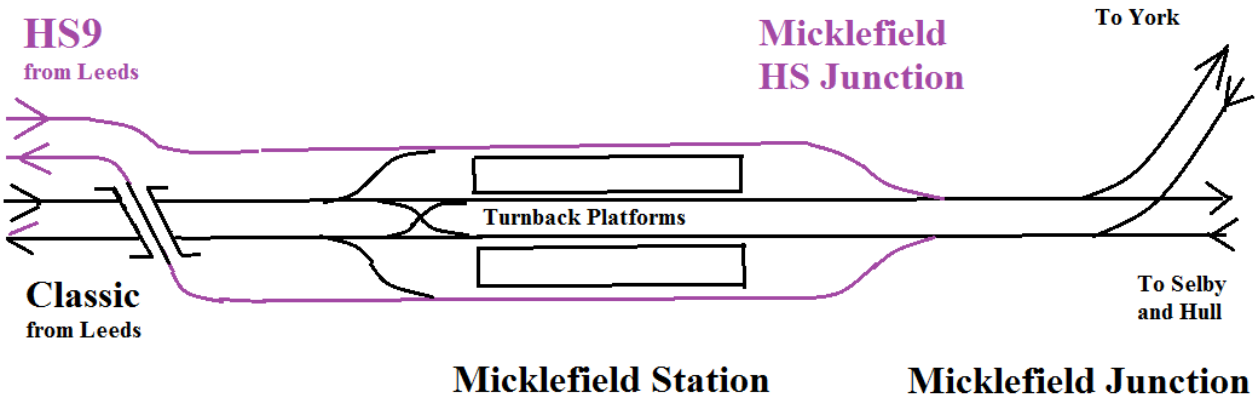
6.1 Leeds – Micklefield

The Strategi maps, at the end of the Route sections, contain a large scale map of the traverse of Leeds. This should clarify the above description.

After the Lord Mayor's Show … HS9 then proceeds boringly along the south side of the Leeds and Selby route, crossing to the north side of the alignment just before Cross Gates station, and follows that until Garforth West Junction, at SE387342, where a spur diverges to the HS3 main line to York (which it joins at Garforth East Junction, SE395341). The main line of HS9 passes in a ¾ mile tunnel under Garforth, between SE403338 and SE420329, and continues to Micklefield HS Junction , SE439327, where it joins the classic route to York / Hull, immediately before the relocated Micklefield ststion.

It is currently planned to use Micklefield as a turnback for local services from west of Leeds City. This needs a station with two island platforms, the outer platform faces used by through services, and the inner pair by terminating services. The existing Micklefield station could be extended, at the cost of demolishing perhaps 4 houses, or a new station provided a short distance to the west, as noted above, where there is plenty of room on the north side of the alignment. Note, however, that a road, Phoenix Avenue, has been built on the south side, presumably in anticipation of an extension to the nearby Peckfield Business Park, but which hasn't happened yet, according to the satellite map. This would provide access to the new station, but this needs to be incorporated in the local plans.

Here's an appropriate configuration for Micklefield:

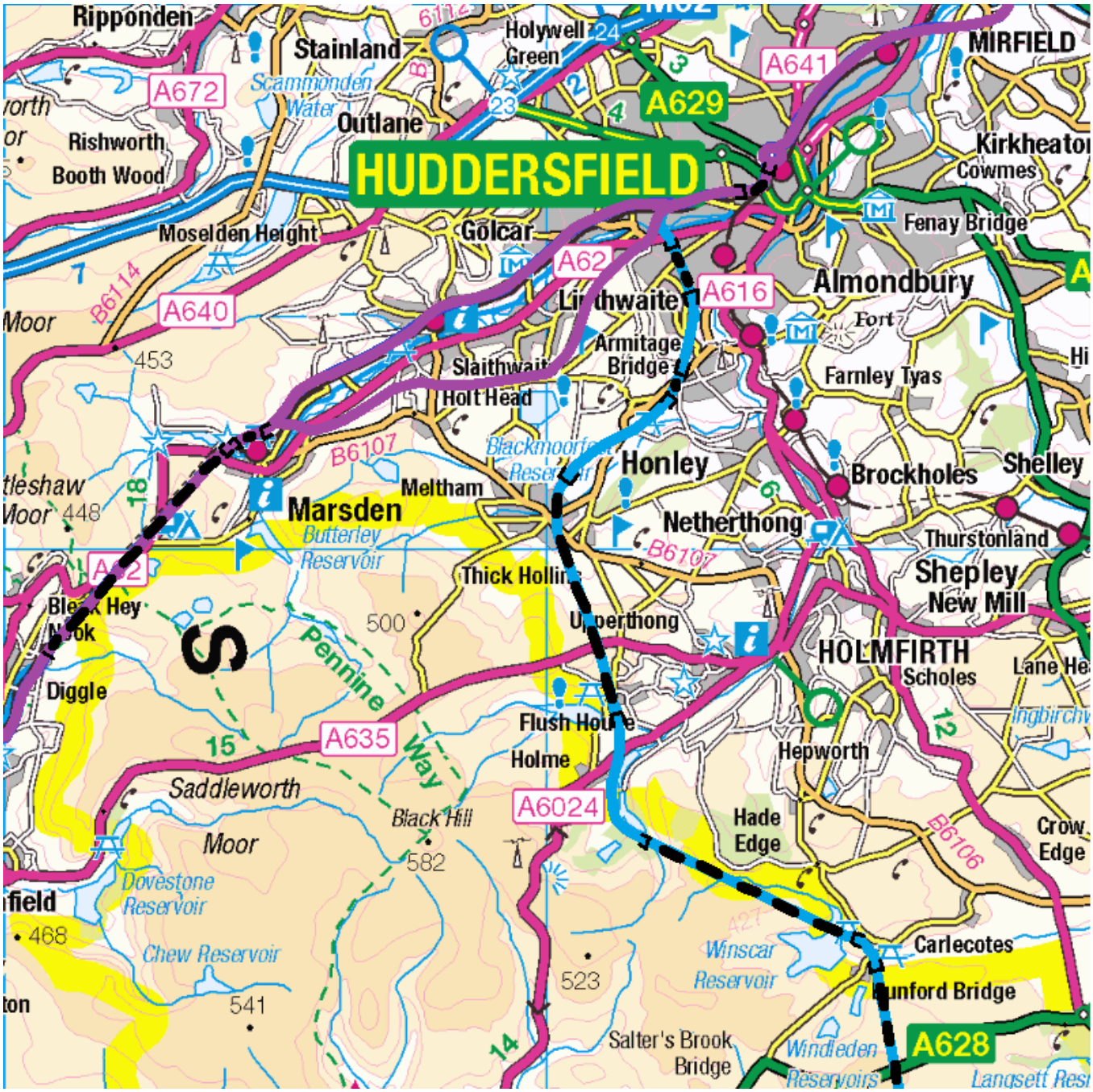


The outer platform faces are for **all** through trains – the HS ones are all classic-compatible.

7. HS8 Ladybower Junction – Paddock Junction

The Huddersfield branch of HS8 diverges from the main line at Ladybower Junction (SK201864), at an altitude of 750ft, and follows the eastern side of Derwent Dale, alongside three reservoirs, and reaches the 1000ft contour at SK170961, 250ft in 6½ miles – 1 in 137. At that point it enters a 4 mile tunnel to Dunford Bridge, emerging at SE156021, still at 1000ft, so the tunnel is level. Crossing above the east portal of Woodhead tunnel, it enters a 3 mile tunnel at SE156025, emerging at SE113052, at the southern tip of Ramsden Reservoir, altitude 820ft, 180ft in 3 miles – 1 in 88. It follows the western edge of the reservoir, followed by Brownhill Reservoir, descending to 700ft at SE113069, just west of Holmbridge, 120ft in 1¼ miles – 1 in 55. At this point it enters a 2½ mile tunnel, emerging at SE107113, east of Meltham, and there takes over the alignment of the long-closed Meltham branch, altitude 450ft, 250ft in

2½ miles – 1 in 53. It follows the alignment to Beaumont Park, this section being essentially level. The short tunnel at Netherton is widened and a second bore provided (this very conveniently passes under a quite extensive area of housing). Between SE124133 and SE126142 a new, straight alignment is provided to ease a serious curve (and to avoid a row of 4 houses which have, most inconsiderately, been built directly along the old alignment). From Beaumont Park, is enters a 1 mile tunnel at SE126144, emerging in the Colne Valley at SE125157, (the tunnel is essentially level,) and joining the classic alignment at Paddock Junction, SE124161 (the alternative route of HS9 also joins here). [See map 3.2/7.1 Glossop – Ladybower Junction for the first section.]



7.2 Dunford Bridge – Huddersfield

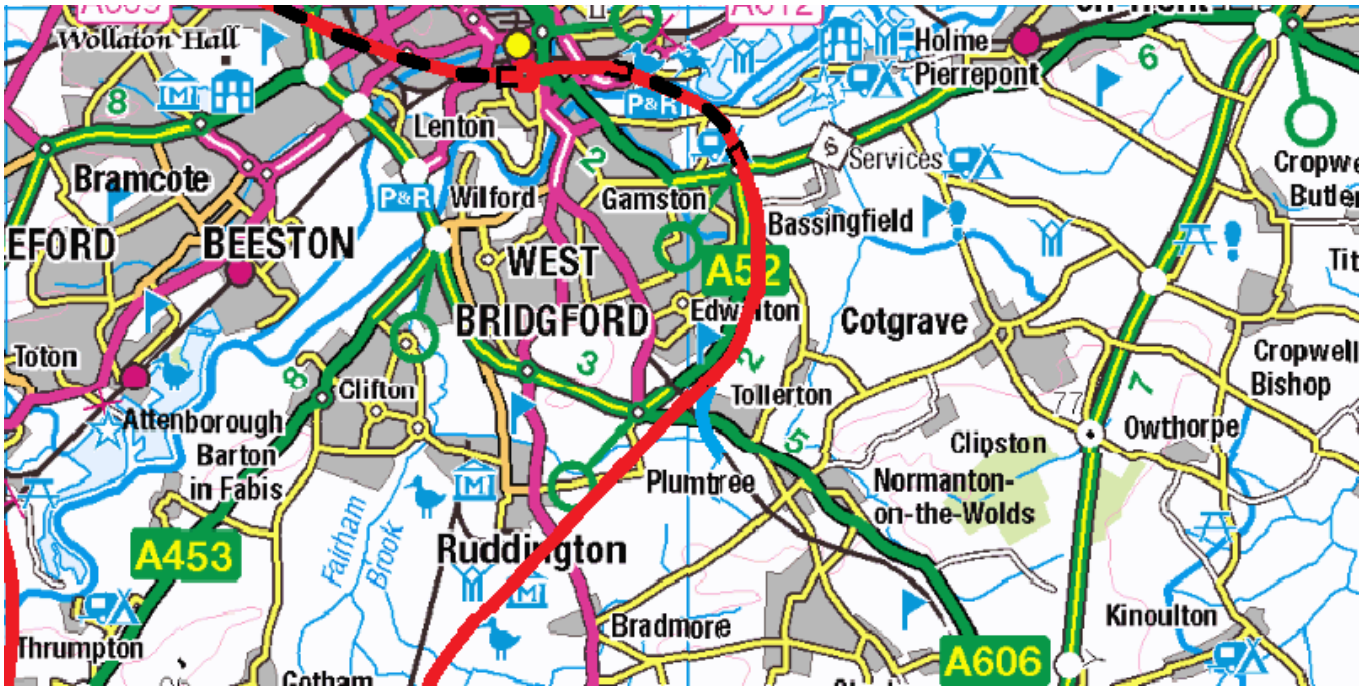
From Dunford Bridge on, this has been an extraordinarily difficult route to plan. It's not at all obvious where to bring it out. The seemingly obvious destination in the Holmfirth area, then down the Holme Valley, proved completely impracticable on a number of grounds, without surprisingly extensive demolitions and some pretty major viaducts – the levels are simply wrong.

8. *HS8 Edwalton Junction – Peterborough*

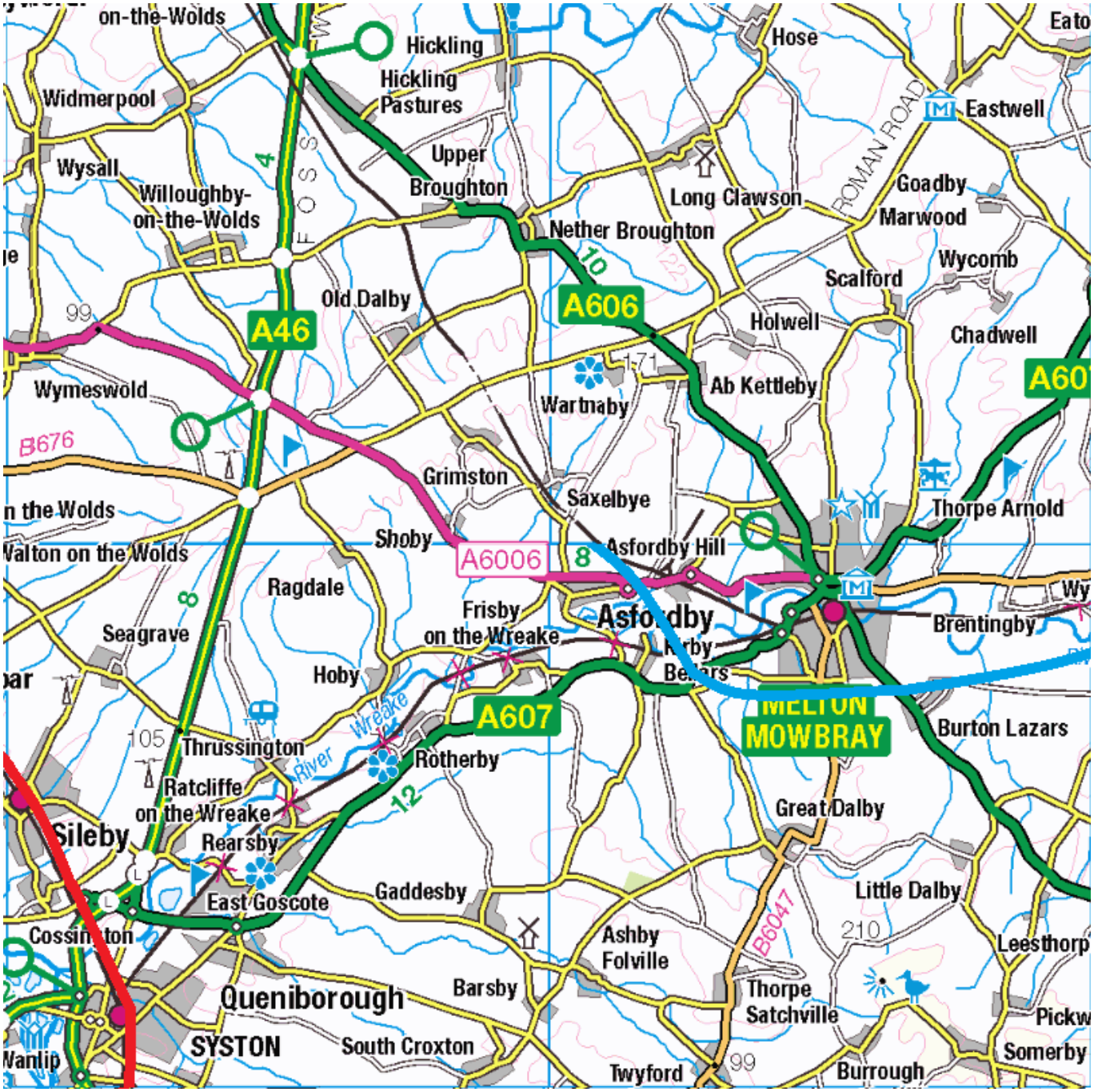
Between Wales Junction and Edwalton Junction, HS8 shares the route of HS3, including the Nottingham branch. From Edwalton Junction to Asfordby Junction (below), HS8 takes over the alignment of the Midland route from Nottingham to Melton Mowbray. In this and the next section, HS8 at Mk1A differs significantly from the Mk1 version, and also, to a lesser extent, from Mk2. At Mk1A, HS8 merges with the classic route as far as the restored Wymondham Junction.

At Mk2, HS8 diverges from the classic route via Melton Mowbray at Asfordby Junction, (SK711199). It passes round the south of Melton Mowbray on a completely new alignment, crossing the A6006 at SK717191, the A607 at SK728177, the A606 at SK763173, across the top of Stapleford Park, crossing the Midland route at SK823187, and joins the alignment and takes over the trackbed of the long closed line from Saxby to Bourne at Wymondham East Junction, SK830189. (There is a connection from the classic route at Wymondham West Junction, SK820191, the original Wymondham Junction, renamed. This of course follows the initial section of the Saxby – Bourne line. It is the Mk1A connection, and is retained long-term.)

HS8 follows the Saxby – Bourne line until TF045179, where it diverges onto a completely new alignment; in this section there are no obstructions at all (no buildings, that is; most of the bridges have disappeared since the line closed, including the particularly important one over the ECML). It crosses the A6121 at TF073174, curving to the south to cross Swallow Hill (a very minor road) at TF084168 to reach Thurlby Junction, where HS10 from Lincoln joins (eventually; it won't be there yet). It crosses Macmillan Way (another v. minor road) at TF099159, King Street (Roman road) at TF107132, Stow Road (Langtoft) at TF113116, the A1175 at TF120097 and High Street (Maxey) at TF118079, joining and crossing over to the west side of the ECML alignment at TF132055, Pellett Hall Junction, where it joins and merges with the Midland tracks. At Mk1A. HS8 reaches the existing Peterborough station over the Midland tracks. At Mk2 it has its own tracks, and enters a 3 mile tunnel at TF162028, emerging at TL184992, immediately before Peterborough station, where it now has its own platforms, on the west side of the station, where there is plenty of room (lots of car parks).



8.1 Nottingham – Stanton-on-the-Wolds



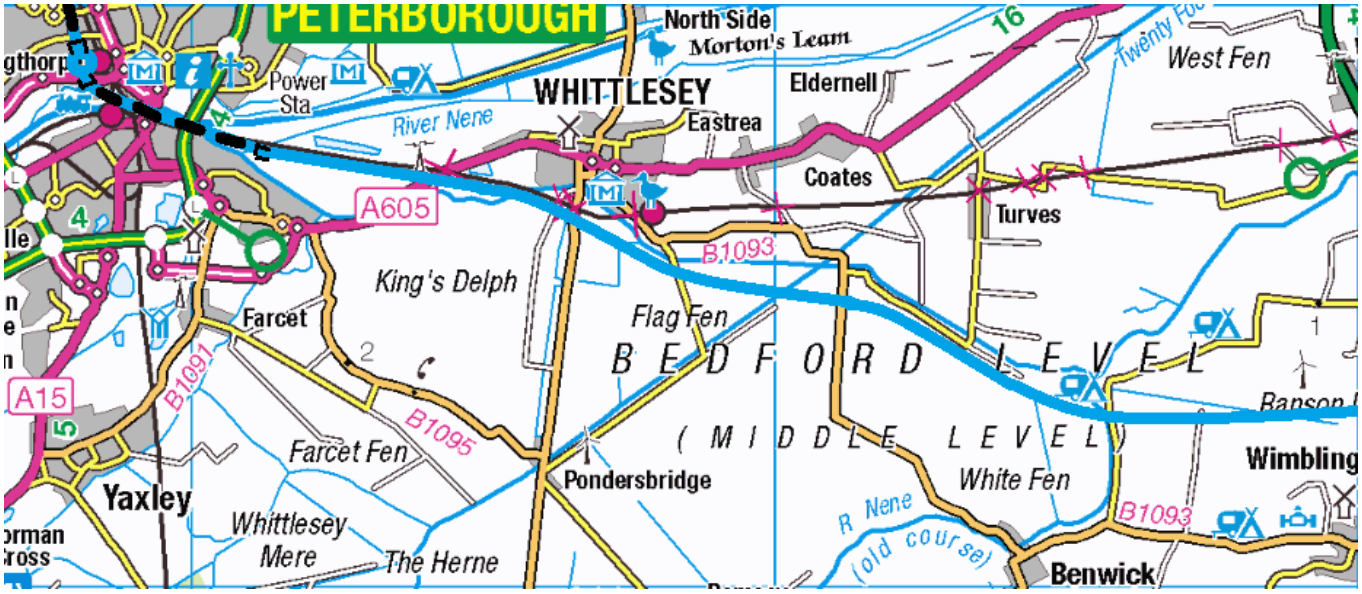
8.2 Hickling Pastures – Brentingby Contains Ordnance Survey data © Crown copyright and database right 2013

8.3 Stapleford – Castle Bytham Contains Ordnance Survey data © Crown copyright and database right 2013

8.3 Little Bytham - Peterborough

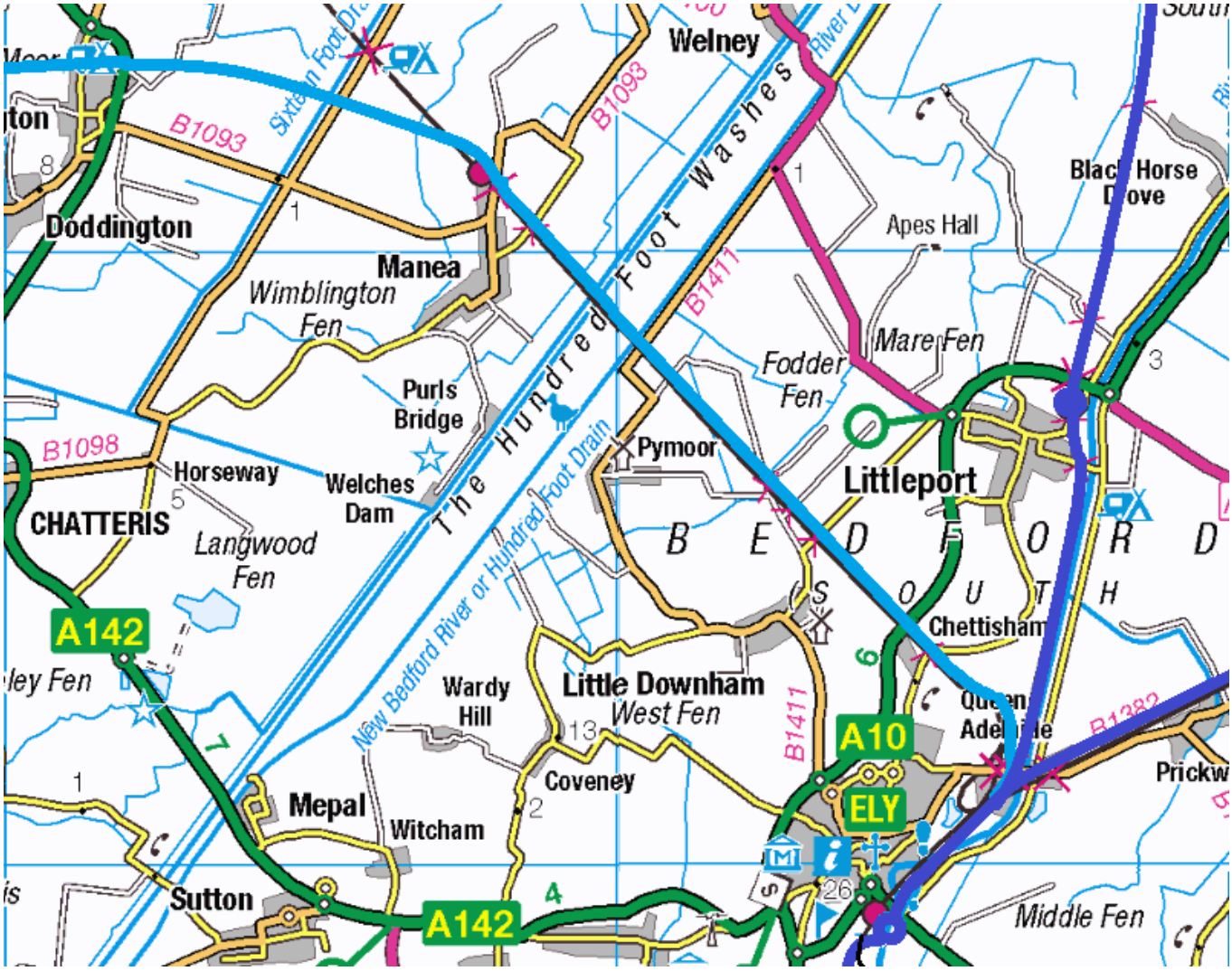
9. *HS8 Peterborough – Ely*

At Mk1A, HS8 follows the classic route to Ely. At Mk2, it enters a 1 mile tunnel immediately south of the station, at TL187987, and emerges at Stanground Junction, TL205978, on the south side of the classic alignment, where there is a northbound connection from HS8 to the classic tracks into Peterborough. (The point of this is to allow certain services to reach the ECML.) HS8 follows the classic route to Whittlesey, but diverges at TL268963, and takes a direct line to Manea, initially following (roughly) the course of the Whittlesey Dike to Flood's Ferry (TL357938), then straight to Wimblington, crossing the B1093 at TL413928 and the A141 at TL420930. From there it heads straight to join the north east side of the classic alignment just above Manea station, crossing at TL479912 (because that side of the alignment is empty, and the other is heavily built-up). This it follows all the way to Ely.



9.1 Peterborough – Wimblington Contains Ordnance Survey data © Crown copyright and database right 2013

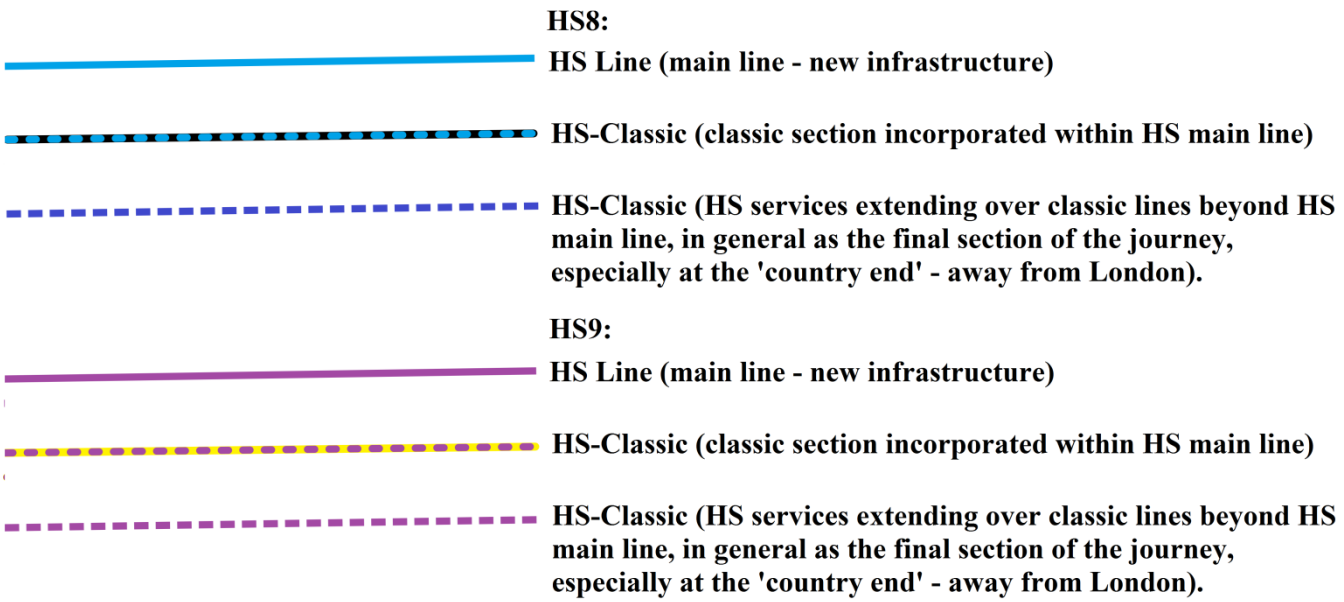
Note that this map is slightly wider than 20km (c21.3km)



9.2 Wimblington – Ely Contains Ordnance Survey data © Crown copyright and database right 2013

Overall Maps

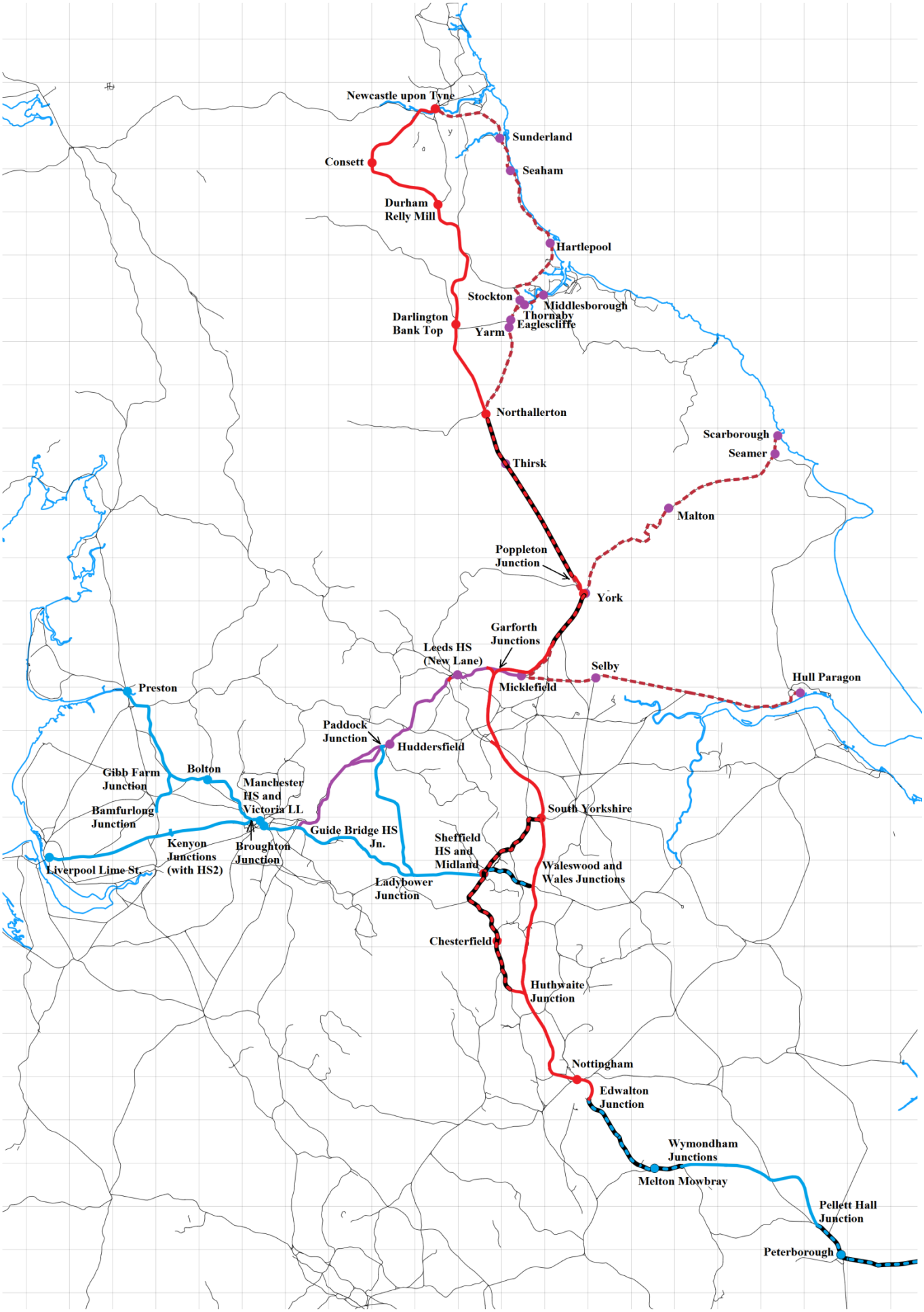
There follow maps of the overall HS8/HS9 routes (and portions of other associated HS routes used by HS8/HS9's services). Those portions of the main lines of HS9/HS9 which incorporate sections of classic route, and the sections of HS-Classic services extending over classic routes beyond the HS8/HS9 main lines, are shown as dotted lines, but differently. The following schematic should clarify:

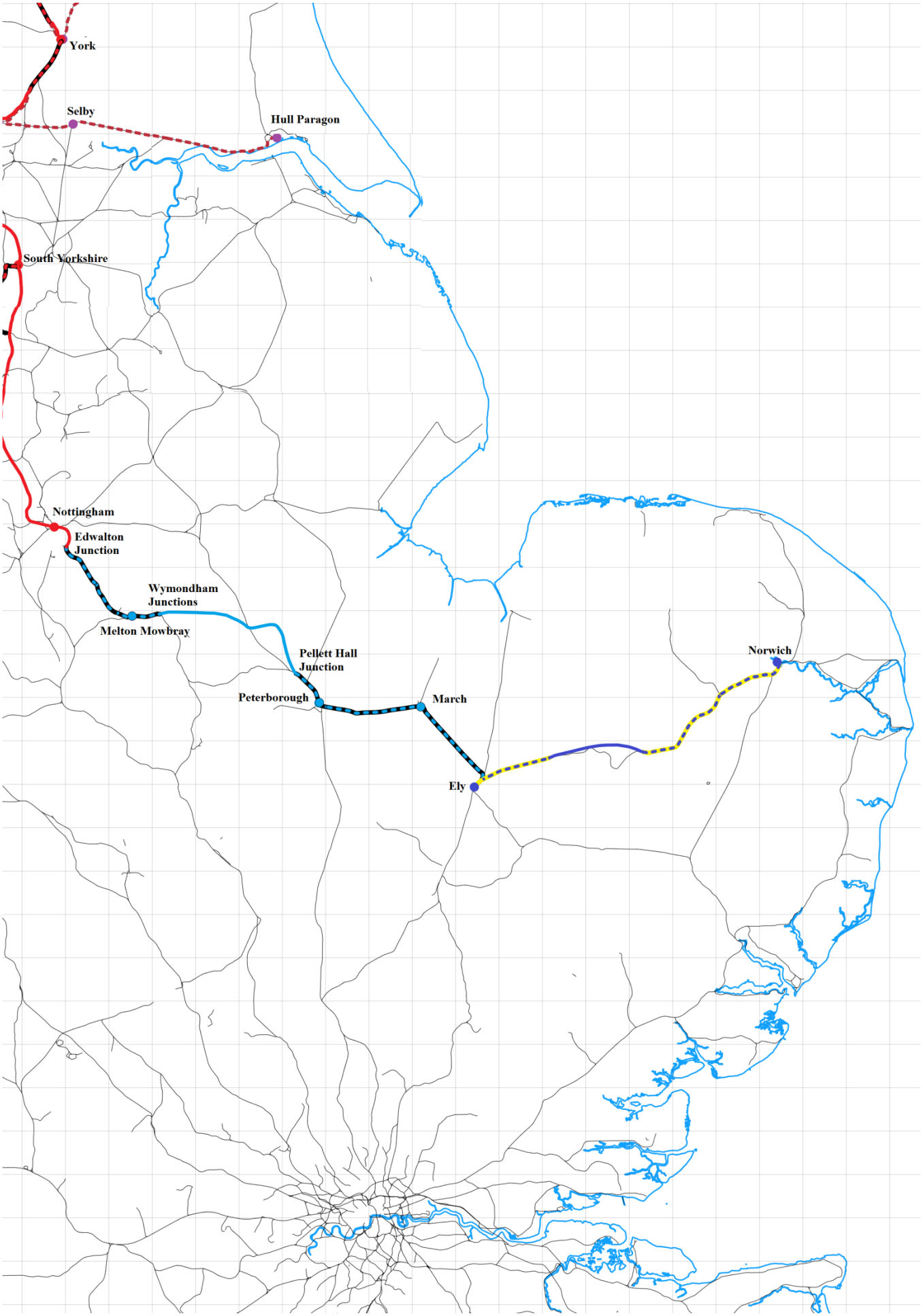


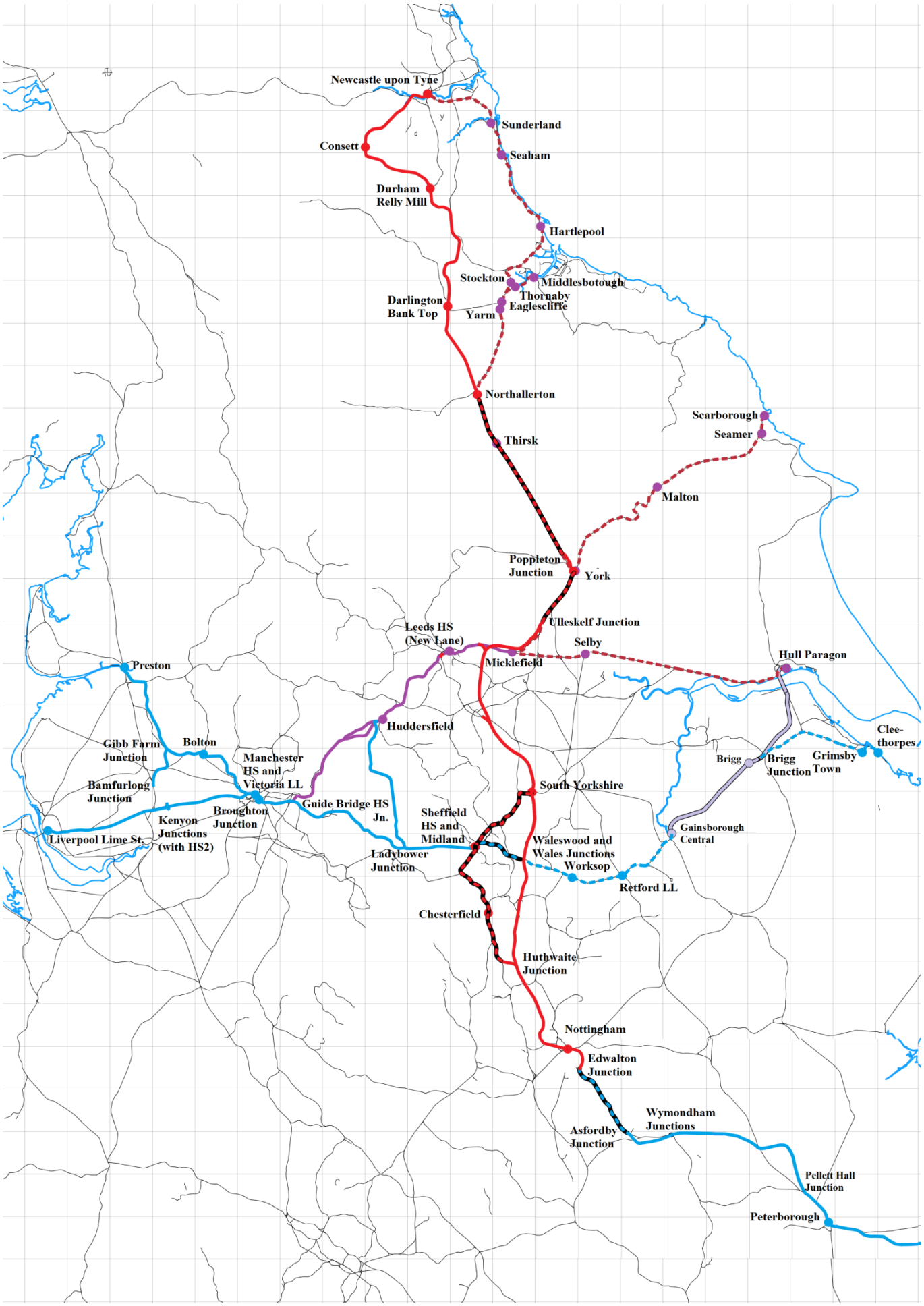
Similar lines appear for HS3, HS6 and HS10, in their standard colours (see p.3).

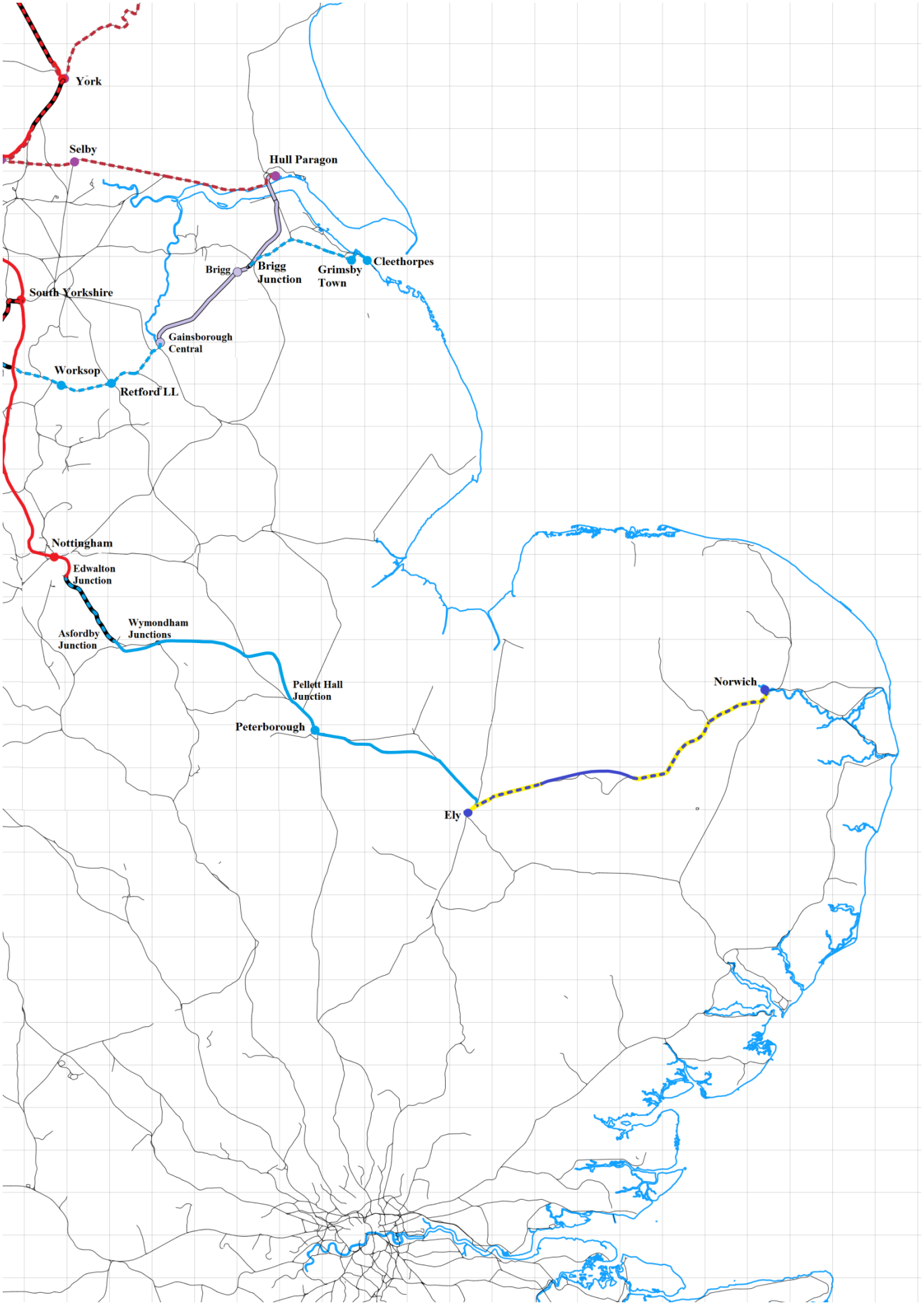
If the full Mk2 is implemented, there will no longer be any sections of classic route incorporated within the HS8/HS9 main lines; it will all be new infrastructure. Accordingly, the middle of the above line symbols is no longer used. The connections between HS and classic routes will all remain, of course, no longer used by scheduled services, but immensely valuable for operational flexibility, in particular when engineering work is carried out on the main line. (However, the preceding is not in fact the case for HS8, HS3, HS6 and HS10 Mk2. It is expected that most of the incorporated classic sections of those routes will remain in main line use.)

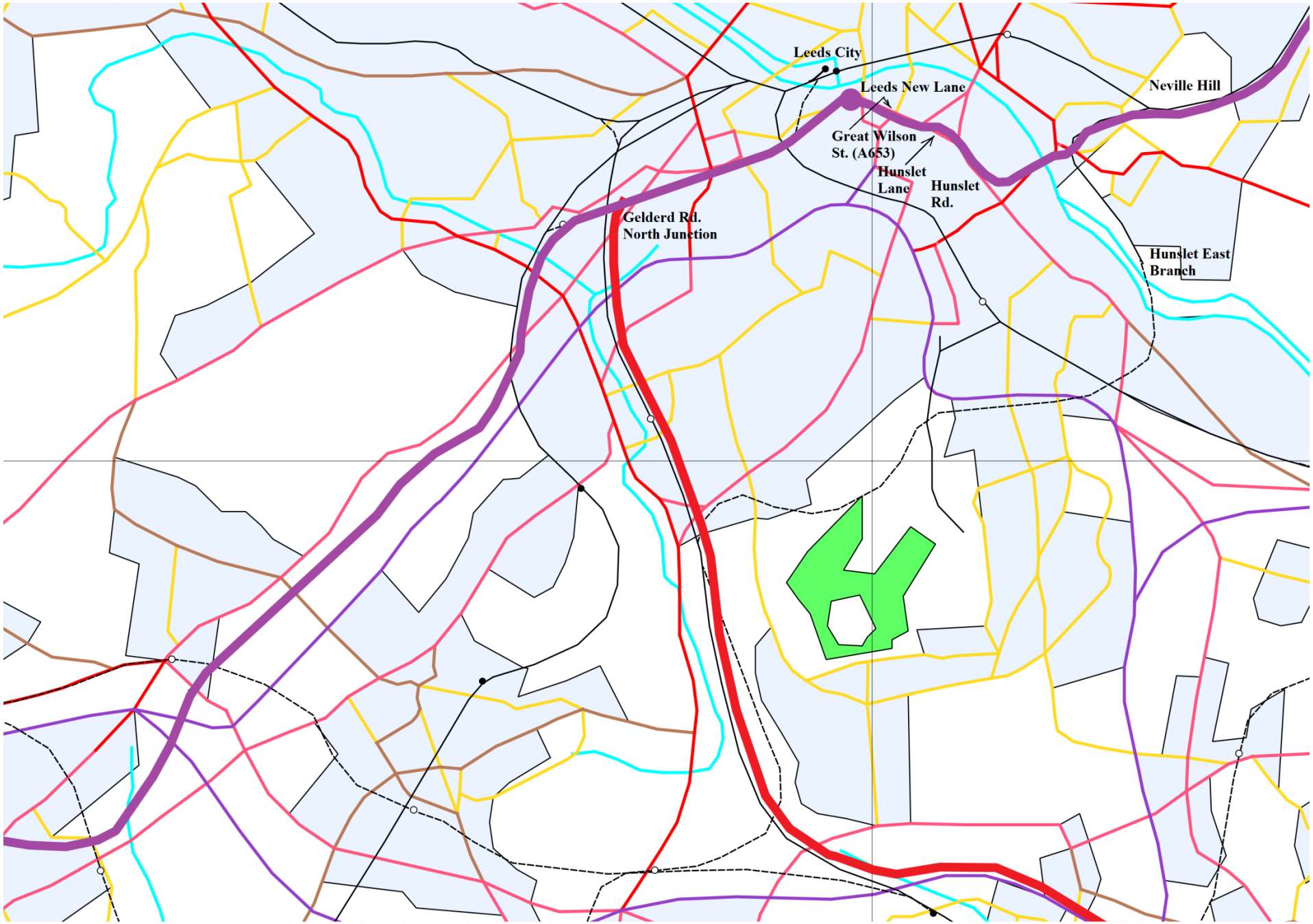
The first two maps show the HS8/HS9 routes (west and east sheets) at Mk1A. They show the alignments changed from Mk1, including sections of classic route incorporated into HS8/HS9. These are followed by the full Mk2 versions of the same sheets. Finally the maps of the overall network are presented, in Mk1A and extended form. Note that these will be updated over the coming months as the various Route and Service Plans articles are reissued incorporating the Mk1A changes.

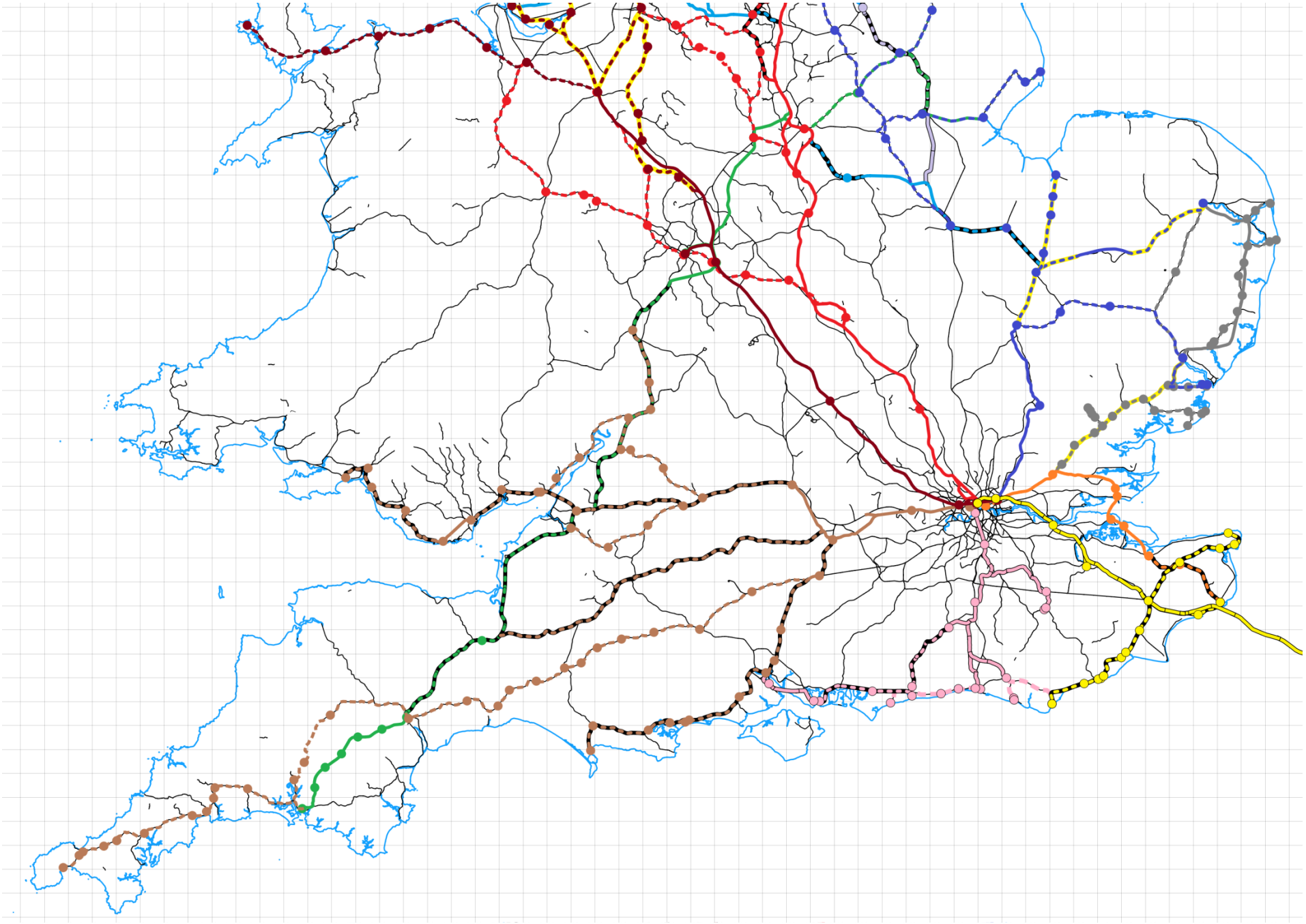




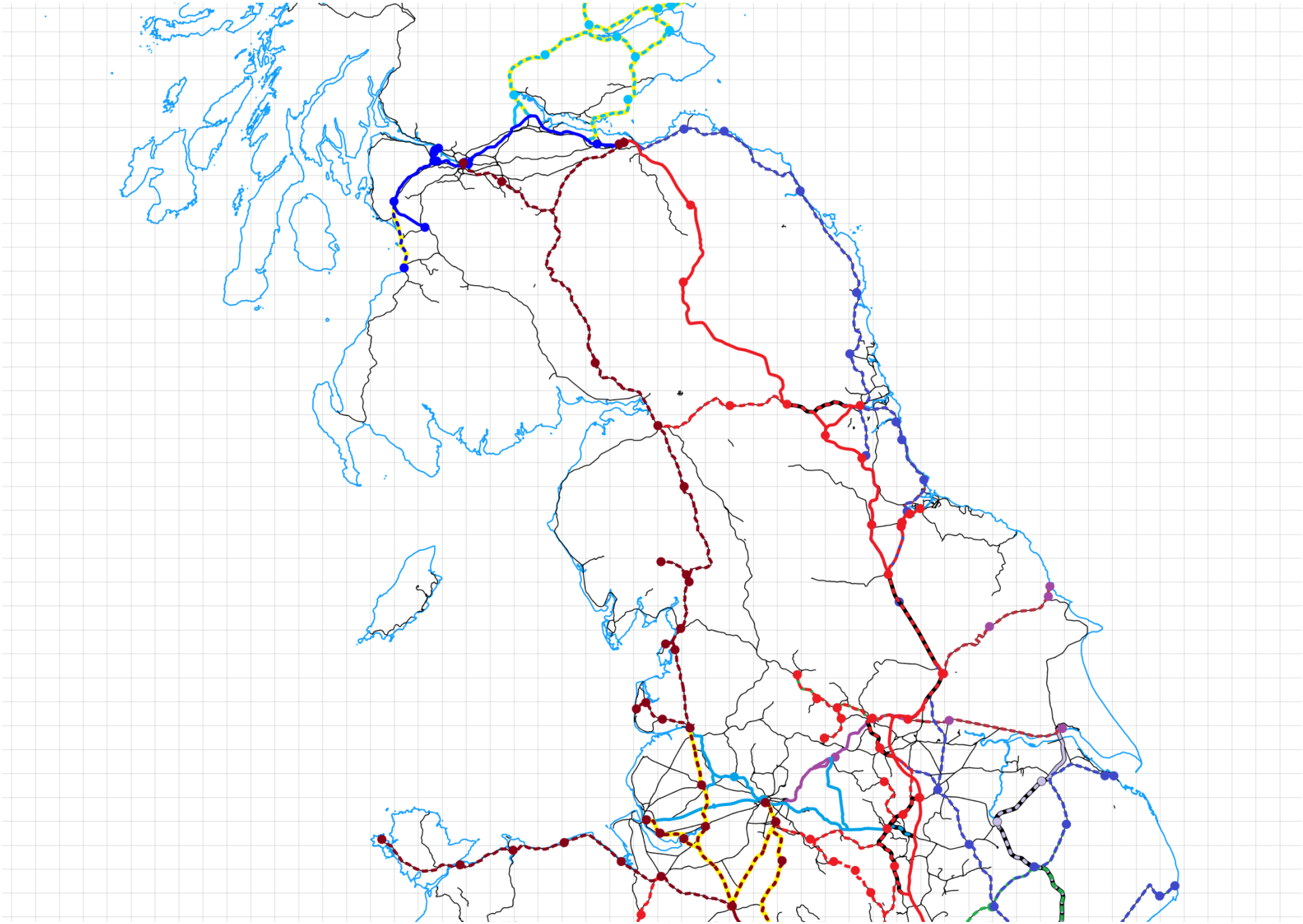


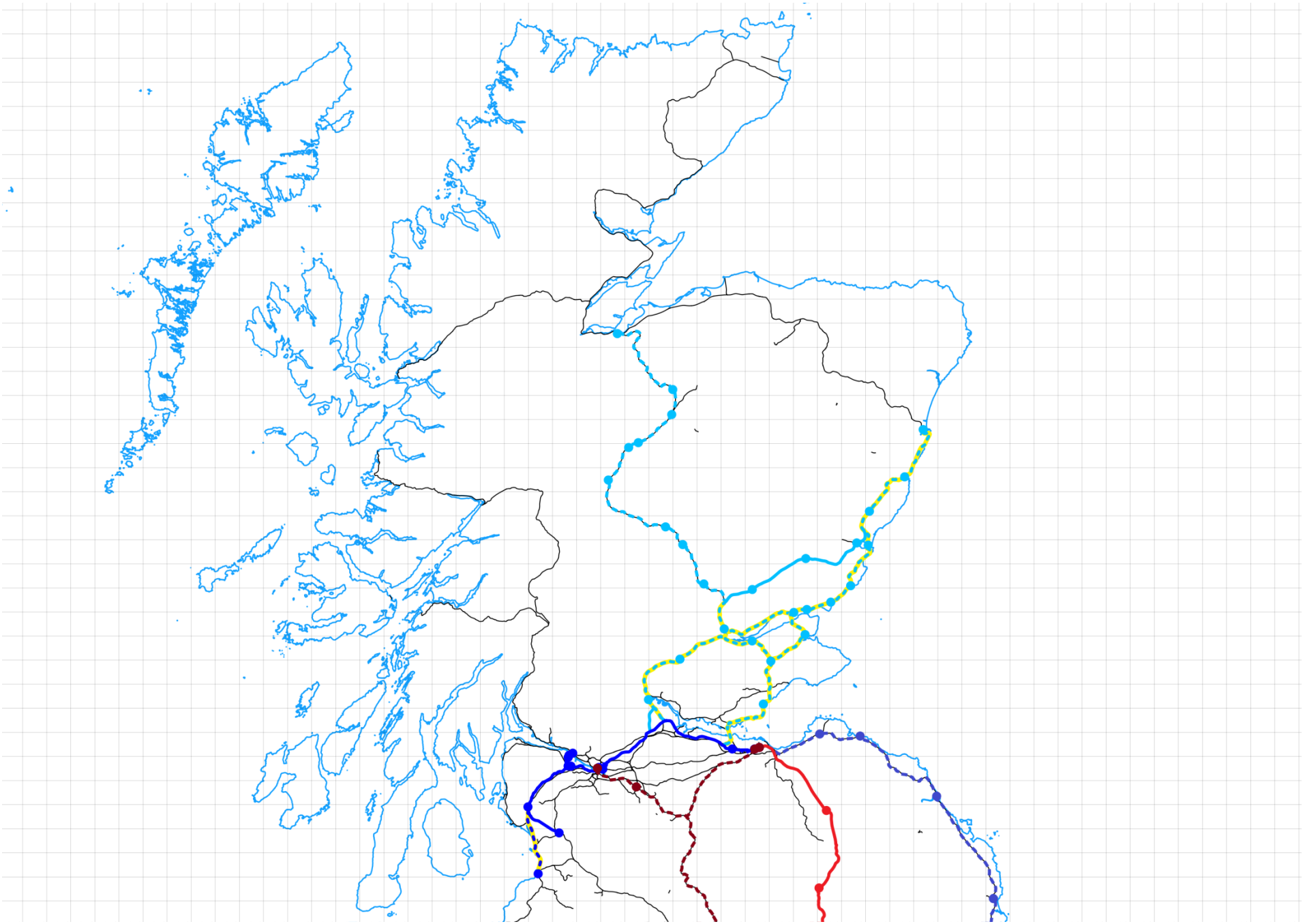




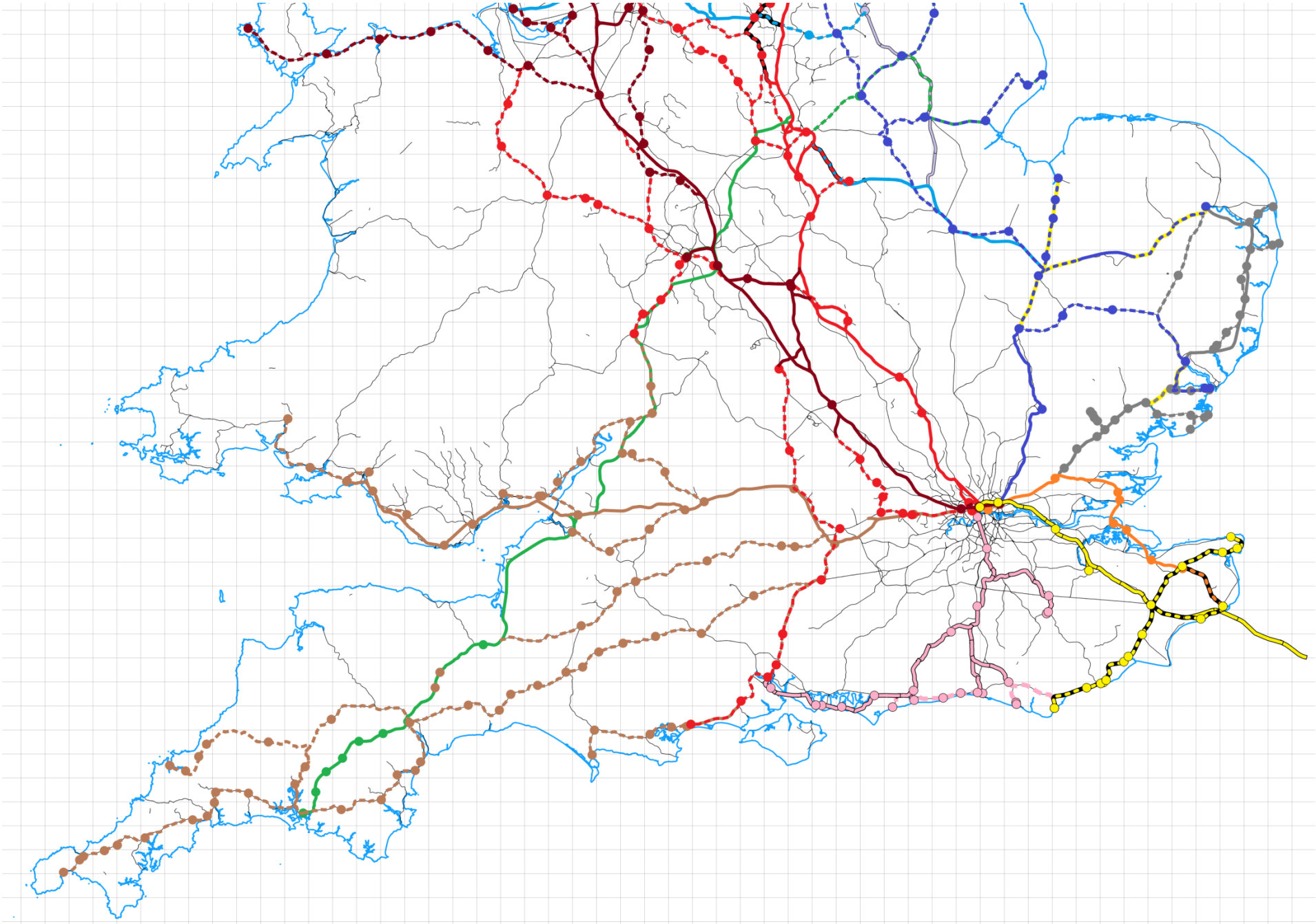


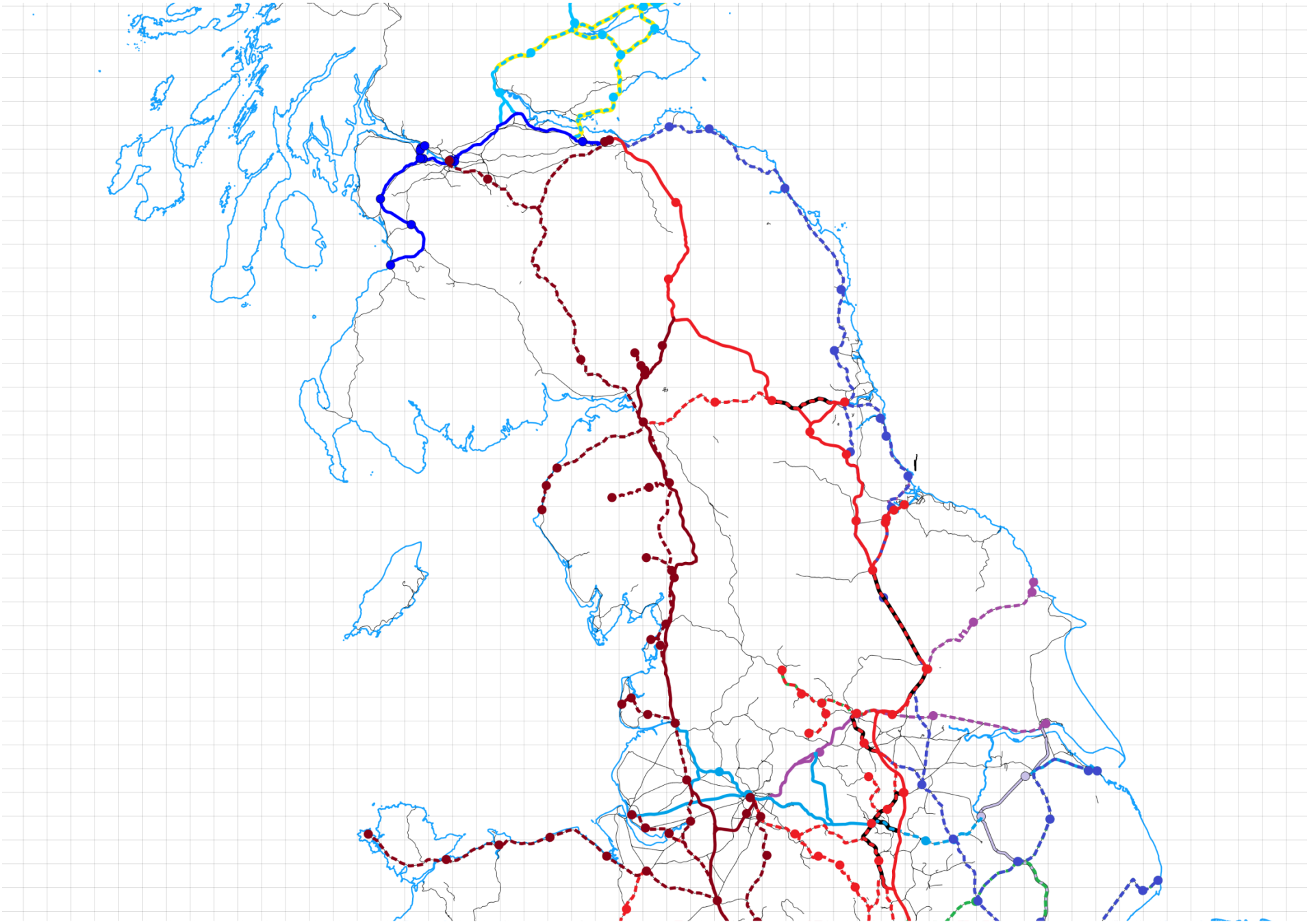
Complete HS Network, South Sheet

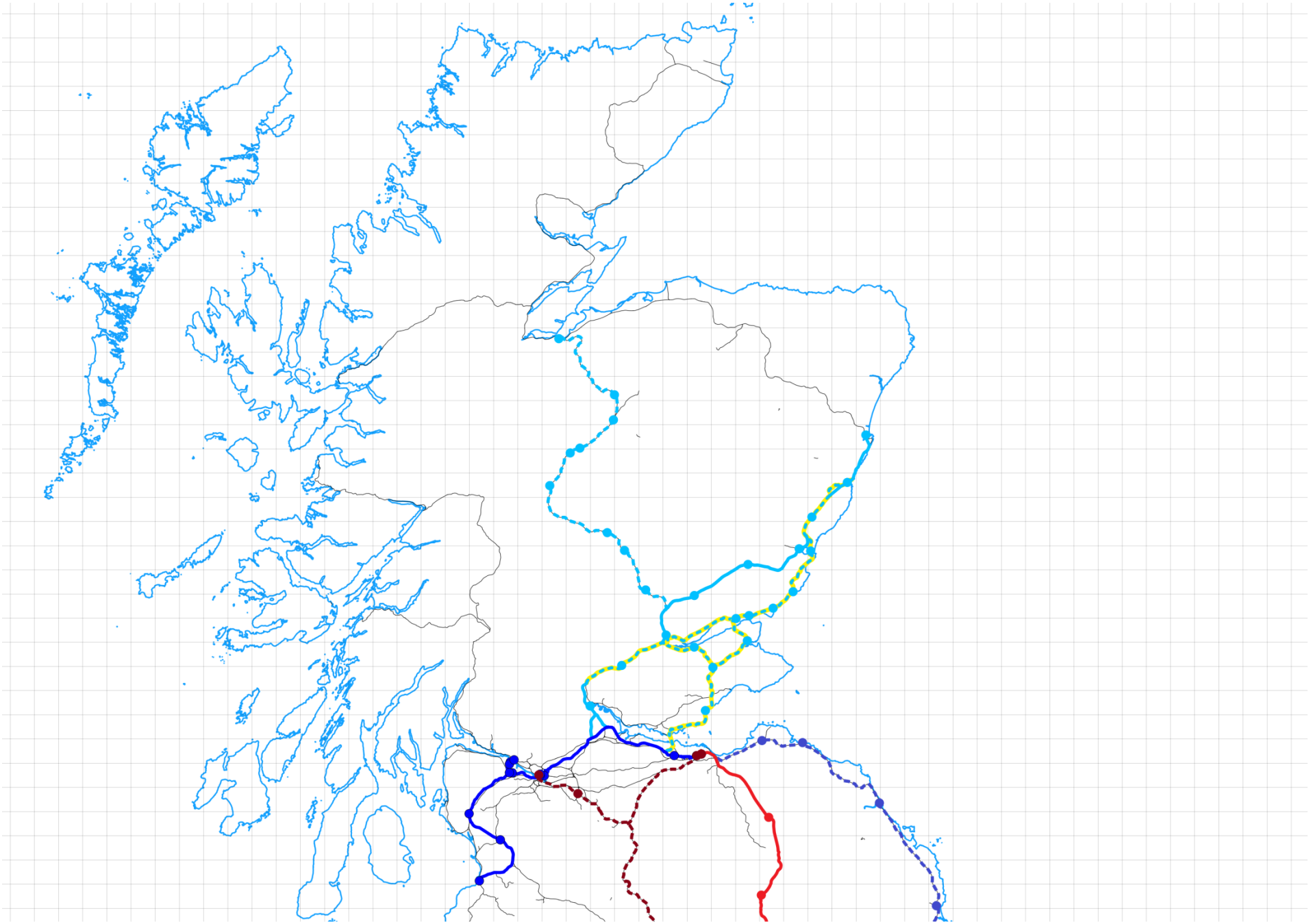




Complete HS Network, North Sheet







The Service Plans

A new service plan comes into effect when some significant change takes place which causes a change to the service loadings of one or more sections of HS8 or HS9 themselves. This most commonly occurs when a new section of HS8 or HS9 opens, but it may also be a consequence of a change on some other HS route.

The service plans use the following notation:

- tph trains per hour
- H High Speed train – at least part of the journey being on the HS main line
- R Regional Metro train, semi-fast service
- RS Regional Metro train, stopping service (all stations)

High Speed trains invariably travel over classic lines also (even if only those sections incorporated in the HS main line). Regional Metro services generally travel their entire journey over classic lines, though this is not an absolute requirement; but if they do travel over any HS section, they must be formed of HS stock – obviously!

Occasionally other notations are used; these will be defined when used.

As was mentioned earlier, the service plans deliberately envisage maximum frequencies. The results may thus seem, at least initially, somewhat optimistic.

Service Plan 0

This isn't really a service plan at all – as far as HS8/HS9 are concerned. The very first instalment of HS8 – between Kenyon West Junction and Liverpool Lime St., together with the connections to HS2 north and south – is delivered as part of HS2 phase 2B – SP4. The initial (HS2) services are:

- 2tphH Liverpool Lime St. – Crewe – Old Oak Common – Euston Cross [–> Hastings – Eastbourne]
- 1tphH Liverpool Lime St. – Wigan North Western(*) – Preston (splits/joins) –:
  – Oxenholme – Carlisle – Lockerbie – Haymarket – Edinburgh Waverley
  – Lancaster – Penrith – Carlisle – Lockerbie – Glasgow Central
- 1tphH Birmingham HS – Crewe – Wigan North Western(*) – Preston (splits/joins) –:
  – Oxenholme – Carlisle – Lockerbie – Haymarket – Edinburgh Waverley
  – Lancaster – Penrith – Carlisle – Lockerbie – Glasgow Central

(*) Initially the HS services from Liverpool and Birmingham to Scotland travel via Kenyon North Junction and join the WCML at Bamfurlong Junction, calling at Wigan North Western. This changes at SP1, when HS8 opens from Bamfurlong Junction to Preston via Gibb Farm Junction, and they then travel directly to Preston via HS8, not stopping at Wigan.

Service Plan 0A

This likewise isn't really a service plan at all – as far as HS8/HS9 are concerned. The very first instalment of HS9 – between Gelderd Rd. North Junction (where the classic route from Ardsley Junction joins HS9, just before Leeds New Lane station) and Garforth East Junction / Micklefield Junction – opens at the same time as HS7 opens to Leeds and York. This allows HS7's services to travel from York to Birmingham and points south via Leeds. (These sections are common with HS3, but initially only HS7 services use them. These are HS3 SP2 and HS7 SP3.) The initial (HS7) services are:

- 2tphH York – Leeds HS – South Yorkshire – Derby – Birmingham Interchange – Worcester Shrub Hill – Cheltenham Spa – Bristol Parkway HS – Bristol Temple Meads HS – Taunton – Exeter St. David's – Plymouth.
- 2tphH York – Leeds HS – South Yorkshire – Derby – Birmingham HS.

Service Plan 1

The first service plan comes into effect as soon as the core sections from (Liverpool –) Kenyon West Junction / Preston to Guide Bridge HS Junction, then on to (HS8) Wales Junction and (HS9) Gelderd Rd. North Junction open. In addition, HS3/HS7 opens from York to Newcastle. This corresponds to HS2 SP4A, HS3 SP2A and HS7 SP3A.

The following service is introduced on HS8:

- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Sheffield HS – Nottingham

and on HS9 the services:

- 2tphH Liverpool Lime Street – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – York HS (splits / Joins) –:
  – Darlington – Durham (Relly Mill) – Consett – Newcastle
  – Northallerton – Yarm – Eaglescliffe – Thotnaby – Middlesborough
- 2tphH Liverpool Lime Street – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – York – Thirsk – Northallerton – Yarm – Eaglescliffe – Stockton – Hartlepool – Seaham – Sunderland – Newcastle
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – Selby – Hull
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – York – Malton – Seamer – Scarborough

There is also the new HS2 service:

- 2tphH Preston – Crewe – Old Oak Common – Euston Cross [–> Hastings – Eastbourne]

It imposes the following loadings on HS8 (the section shared with HS3/HS7 includes all the other services using that section):

- Liverpool Lime St. – Kenyon West Junction 7tph
- Kenyon West Junction – Broughton Junction 4tph
- Kenyon West Junction – Kenyon South Junction 2tph
- Kenyon West Junction – Kenyon North Junction 1tph
- Preston – Gibb Farm Junction 8tph
- Gibb Farm Junction – Broughton Junction 4tph
- Gibb Farm Junction – Bamfurlong Junction 4tph
- Broughton Junction – Guide Bridge HS Junction 8tph
- Guide Bridge HS Junction – Ladybower Junction 2tph
- Paddock Junction – Ladybower Junction 0tph
- Ladybower Junction – Wales Junction 2tph
- Wales Junction – Huthwaite Junction 6tph
- Huthwaite Junction – Nuthall North Junction 6tph
- Nuthall North Junction – Nuthall South Junction 2tph
- Nuthall South Junction – Strelley Junction 2tph
- Strelley Junction – Nottingham station 2tph

It likewise imposes the following loadings on HS9 (the section shared with HS3/HS7 includes all the other services using that section):

- Guide Bridge HS Junction – Paddock Junction 8tph
- Paddock Junction – Gelderd Rd. North Junction 8tph
- Gelderd Rd. North Junction – Garforth West Junction 12tph
- Garforth West Junction – Micklefield HS Junction 4tph
- Garforth West Junction – Garforth East Junction 8tph
- Garforth East Junction – York HS station 8tph
- York HS station – Poppleton Junction 12tph
- Poppleton Junction – Romanby Junction 12tph
- Romanby Junction – Derwent Hill Junction 6tph
- Derwent Hill Junction – Paradise Junction 6tph
- Paradise Junction – Newcastle station 6tph

(The Newcastle and Middlesborough portions split at York, travelling as separate trains between York and Romanby Junction.)

Service Plan 2

This service plan comes into effect when HS3 opens from Nuthall South Junction to Leicester, from Nottingham station to Stanford Junction, and from West Hampstead Junction to Pancras Cross. (This is HS3 SP3 and HS7 SP4.) HS8's Huddersfield branch also opens from Paddock Junction to Ladybower Junction.

The following new services are introduced on HS8 (actually both HS3 services):

- 2tphH Liverpool Lime Street – Manchester Victoria (LL) – Manchester HS – Sheffield HS – Pancras Cross (UHS)
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Sheffield HS – Nottingham – Leicester – Northampton – Luton & Dunstable Parkway – Pancras Cross (HS Metro)

In addition, the services:

- (HS3) York – Pancras Cross (HS Metro)
- (HS7) Newcastle / Middlesborough – Plymouth
- (HS7) York – Birmingham HS

are all rerouted between Wales Junction and Gelderd Road North Junction to travel via Sheffield HS and Huddersfield instead of via South Yorkshire.

There are no changes on HS9 as such, but the above rerouting means we can now consider the Northern Transpenning Interchange Pattern at Huddersfield.

The following Regional Metro services run on the Northern Transpennine classic route (note that **all** of them have the stopping pattern: Salford Central – Manchester Victoria – Stalybridge – Diggle – Marsden – Huddersfield – Mirfield – Dewsbury – Batley – Leeds City, which will not be repeated; the point of the stops at Diggle and Marsden is to connect with stopping services either side of Standedge Tunnel):

- 2tphR Chester – Helsby – Warrington Bank Quay – Newton le Willows – Salford Central —> Leeds City – Wetherby – Harrogate – Ripon – Northallerton – Yarm – Eaglescliffe – Stockton – Hartlepool – Seaham – Sunderland – Newcastle
- 2tphR Southport – Wigan Wallgate – Bolton – Salford Crescent – Salford Central —> Leeds City – Wetherby – Harrogate – Ripon – Northallerton – Yarm – Eaglescliffe – Thornaby – Middlesborough
- 2tphR Liverpool Lime Street – St. Helen's Junction – Newton le Willows – Salford Central —> Leeds City – Micklefield – York – Strensall – Malton – Rillington (NYMR) – Seamer – Scarborough
- 2tphR Blackpool North – Poulton le Fylde – Kirkham – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Salford Central —> Leeds City –Micklefield – Selby – Brough – Hull

These services all connect at Huddersfield. The HS services have cross-platform interchange and the RM services have longer stops to allow for platform change. The Representative Hourly Pattern is:

00H Liverpool – Newcastle / Middlesborough
H Preston – Scarborough
R Blackpool – Hull

07H [HS5 Brighton –>] HS3 Pancras Cross – York (HS Metro)
H Liverpool – Newcastle (via Stockton)
R Southport – Middlesborough

15H HS7 Plymouth – Newcastle
H Preston – Hull
R Liverpool – Scarborough

23H HS7 Birmingham HS – York
R Chester – Newcastle (via Stockton)

Service Plan 2A

This service plan comes into effect when HS8 opens from Nottingham to Ely. HS6 from Ely to Norwich opens simultaneously (allowing HS8 services to reach Norwich). The service from Preston to Nottingham is extended to Norwich. The HS4/HS7 service from Swansea to Nottingham is likewise extended to Norwich (this is HS7 SP4). (HS5 has also opened prior to or simultaneously with these developments, and all Pancras Cross services now pass through London to Sussex / West Kent / South Hampshire.)

Representative Hourly Cross-Platform Interchange Pattern at Nottingham:

00H Preston – Norwich (no connection)

07H HS3 [HS5 Brighton –>] Pancras Cross – York (HS Metro)
H HS7 Birmingham HS – Cleethorpes
R York – Melton Mowbray – St. Pancras
R Morecambe – Norwich / Stansted Airport

23H HS3 Preston – Pancras Cross [HS5 –> Brighton] (HS Metro)
H HS7 Swansea – Norwich

– repeating at 30, 37 and 53 minutes past.

Service Plan 2B

This service plan comes into effect when HS10 opens. The following services are introduced:

- 2tphH [HS5 Southampton – >] Pancras Cross – Stansted Airport – Cambridge – Ely – Peterborough – Lincoln – Gainsborough Central – Brigg – Hull Paragon
- 2tphH Norwich – Peterborough – Lincoln – Gainsborough Central – Brigg – Hull Paragon

The following Regional Metro services run on the Southern Transpennine classic route (note that **all** these services have the stopping pattern: Manchester Oxford Rd. – Manchester Piccadilly – Stockport – Chinley – Sheffield Midland, which will not be repeated):

- 2tphR Morecambe – Lancaster – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland (reverse) – Chesterfield – Alfreton and Mansfield Parkway – Langley Mill – Nottingham – Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely (split/joins) –:
  – (reverse) Thetford – Wymondham – Norwich
  – Cambridge – Stansted Airport

- 2tphR Blackpool North – Poulton le Fylde – Kirkham – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland – South Yorkshire – Rotherham – Mexborough – Doncaster – Thorne South – Scunthorpe – Barnetby – Grimsby Town - Cleethorpes
- 2tphR Southport – Wigan Wallgate – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland – South Yorkshire – Rotherham – Mexborough – Doncaster – Thorne North – Goole – Brough – Hull
- 2tphR Liverpool Lime St. – Liverpool South Parkway – Widnes – Warrington Central – Manchester Oxford Rd. —> Sheffield Midland – Worksop – Retford (LL) – Gainsborough Lea Road – Lincoln – Sleaford – Boston – Wainfleet – Skegness

These services all connect at Sheffield HS/Midland. The HS services have cross-platform interchange and the RM services have longer stops to allow for platform change. The Representative Hourly Pattern is:

00H Preston – Norwich
H HS3 York – Pancras Cross [HS5 –> Brighton] (HS Metro)
R Liverpool – Skegness

07H HS7 Newcastle / Middlesborough – Plymouth
(no cross-platform connection)
R Blackpool – Cleethorpes

15H Preston – Pancras Cross [HS5 –> Brighton] (HS Metro)
H HS7 York – Birmingham HS
R Morecambe – Norwich / Stansted Airport

23H Liverpool – Pancras Cross {HS5 –> Tunbridge Wells] (UHS)
(no cross-platform connection)
R Southport – Hull

– repeating at 30, 37, 45 and 53minutes past.

Representative Hourly Cross-Platform Interchange Pattern at Nottingham:

00H Preston – Norwich (no connection)

07H HS3 York – Pancras Cross [HS5 –> Brighton] (HS Metro)
H HS7 Birmingham – Cleethorpes
R York – Melton Mowbray – St. Pancras
R Morecambe – Norwich / Stansted Airport

23H HS3 Preston – Pancras Cross [HS5 –> Brighton] (HS Metro)
H HS7 Swansea – Norwich

– repeating at 30, 37 and 53 minutes past.

Service plan 2 imposes the following loadings on HS8:

- Liverpool Lime St. – Kenyon West Junction 9tph
- Kenyon West Junction – Kenyon South Junction 2tph
- Kenyon West Junction – Kenyon North Junction 1tph
- Kenyon West Junction – Broughton Junction 6tph
- Preston – Gibb Farm Junction 12tph
- Gibb Farm Junction – Kenyon North Junction 4tph
- Gibb Farm Junction – Broughton Junction 8tph
- Broughton Junction – Guide Bridge HS Junction 14tph
- Guide Bridge HS Junction – Ladybower Junction 6tph
- Paddock Junction – Ladybower Junction 6tph
- Ladybower Junction – Woodburn HS Junction 12tph
- Woodburn HS Junction – Waleswood Junction 14tph
- Waleswood Junction – Wales Junction 12tph
- Wales Junction – Huthwaite Junction 20tph
- Huthwaite Junction – Nuthall North Junction 24tph
- Nuthall North Junction – Nuthall South Junction 18tph
- Nuthall South Junction – Strelley Junction 6tph
- Strelley Junction – Nottingham HS station 12tph
- Nottingham HS station – Manvers St. Junction 12tph
- Manvers St. Junction – Edwalton Junction 12tph
- Edwalton Junction – Melton Junction 8tph
- Melton Junction – Wymondham West Junction 10tph
- Wymondham West Junction – Thurlby Junction 4tph
- Thurlby Junction – Pellett Hall Junction 8tph
- Pellett Hall Junction – Peterborough Station (Midland lines) 18tph
- Peterborough station – Ely 18tph

Likewise for HS9:

- Guide Bridge HS Junction – Paddock Junction 8tph
- Paddock Junction – Gelderd Rd. North Junction 14tph
- Gelderd Rd. North Junction – Garforth West Junction 16tph
- Garforth West Junction – Micklefield HS Junction 6tph
- Garforth West Junction – Garforth East Junction 10tph
- Garforth East Junction – York HS station 14tph
- York HS station – Poppleton Junction 14tph
- Poppleton Junction – Romanby Junction 20tph
- Romanby Junction – Derwent Hill Junction 8tph
- Derwent Hill Junction – Paradise Junction 6tph
- Paradise Junction – Newcastle station 10tph

Service Plan 2 Summary

It's worth summarising the full set of services at service plan 2, as this represents the final, complete state of these plans, and the services have so far been introduced piecemeal, at the various stages.

Non-Transpennine Services:

- 2tphH Liverpool Lime St. – Crewe – Old Oak Common – Euston Cross [–> Hastings – Eastbourne]
- 2tphH Preston – Crewe – Old Oak Common – Euston Cross [–> Hastings – Eastbourne]
- 1tphH Liverpool Lime St. – Preston (splits/joins) –
  – Oxenholme – Carlisle – Lockerbie – Haymarket – Edinburgh Waverley
  – Lancaster – Penrith – Carlisle – Lockerbie – Glasgow Central
- 1tphH Birmingham HS – Crewe – Preston (splits/joins) –
  – Oxenholme – Carlisle – Lockerbie – Haymarket – Edinburgh Waverley
  – Lancaster – Penrith – Carlisle – Lockerbie – Glasgow Central

Southern Transpennine Services:

HS8:

- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Sheffield HS – Nottingham – Melton Mowbray – Peterborough – March – Ely (reverse) – Norwich

Thar's all. The other services are HS3.

Regional Metro:

(Note that **all** these services have the stopping pattern: Manchester Oxford Rd. – Manchester Piccadilly – Stockport – Chinley – Sheffield Midland, which will not be repeated):

- 2tphR Morecambe – Lancaster – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland (reverse) – Chesterfield – Alfreton and Mansfield Parkway – Langley Mill – Nottingham – Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely (split/joins) –:
  – (reverse) Thetford – Wymondham – Norwich
  – Cambridge – Stansted Airport
- 2tphR Blackpool North – Poulton le Fylde – Kirkham – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland – South Yorkshire – Rotherham – Mexborough – Doncaster – Thorne South – Scunthorpe – Barnetby – Grimsby Town – Cleethorpes
- 2tphR Southport – Wigan Wallgate – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland – South Yorkshire – Rotherham – Mexborough – Doncaster – Thorne North – Goole – Brough – Hull
- 2tphR Liverpool Lime St. – Liverpool South Parkway – Widnes – Warrington Central – Manchester Oxford Rd. —> Sheffield Midland – Worksop – Retford (LL) – Gainsborough Lea Road – Lincoln – Sleaford – Boston – Wainfleet – Skegness

The following extracts from other routes' service plans include only those services which contribute to HS8's loadings. They are thus not complete SPs (though, in HS3's case, almost so).

HS3 Long Distance UHS:

- 2tphH Glasgow St. Enoch – Glasgow Bellgrove – Edinburgh Airport – Haymarket – Edinburgh Waverley HS – Hawick – Hexham – Consett – Durham (Relly Mill) – Darlington – York – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Lewes – Eastbourne
- 2tphH Glasgow St. Enoch – Glasgow Bellgrove – Edinburgh Airport – Haymarket – Edinburgh Waverley HS – Lauder – Hawick – Hexham – Newcastle
- 2tphH Carlisle – stations to Hexham – Newcastle
- 2tphH Newcastle – Consett – Durham (Relly Mill) – Darlington –:
  Middlesborough – Thornaby – Eaglescliffe – Yarm – Northallerton – :
  York HS (joins / splits) – South Yorkshire HL – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Lewes – Newhaven Town – Newhaven Marine
- 2tphH Liverpool Lime St. – (Manchester) Victoria LL – Manchester HS – Sheffield HS – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West
- 2tphH York HS – Leeds HS – Wakefield Westgate – South Yorkshire HL – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West
- 2tphH Halifax – Bradford City – Shipley –:
  Skipton – Keighley – Shipley –:
  Leeds City (joins / splits) – South Yorkshire HL – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West
- 2tphH Barnsley –:
  South Yorkshire LL – Rotherham –:
  Sheffield Midland (joins / splits) – Chesterfield – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West

HS3 Metro:

- 2tphH York HS – Leeds HS – Huddersfield – Sheffield HS – Nottingham – Leicester – Northampton – Luton & Dunstable Parkway – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Brighton
- 2tphH Preston – Bolton – (Manchester) Victoria (LL) – Manchester HS – Sheffield HS – Nottingham – Leicester – Northampton – Luton & Dunstable Parkway – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Brighton

MML and other Regional Metro:

- 2tphR St. Pancras – St. Albans – Luton Airport Parkway – Luton – Bedford – Wellingborough – Kettering – Corby – Oakham – Melton Mowbray – Nottingham – Langley Mill – Alfreton & Mansfield Parkway – Chesterfield – Sheffield Midland – Rotherham – Pontefract – York
  (note that this uses HS3 on the approach to Nottingham)
- 2tphR Worcester Shrub Hill – Droitwich Spa – Bromsgrove – University – Birmingham New St. – Coleshill Parkway – Nuneaton – Hinckley – Leicester – Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely – Bury St. Edmunds – Ipswich – Harwich International – Harwich Town

- 2tphR Morecambe – Lancaster – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Road – Manchester Piccadilly – Stockport – Chinley – Sheffield (reverse) – Chesterfield – Alfreton and Mansfield Parkway – Langley Mill – Nottingham – Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely (splits / joins) – :
  – (reverse at Ely) Thetford – Wymondham –Ely (reverse) – Norwich
  – Cambridge – Stansted Airport
- 2tphR Edinburgh Waverley – Drem – Dunbar – Berwick-upon-Tweed – Alnmouth – Morpeth – Newcastle – Chester le Street – Durham – Darlington – Northallerton – Thirsk – York

HS6 West of Ely, and HS10:

- 2tphH Hull Paragon – Brigg – Gainsborough Central – Lincoln – Sleaford – Peterborough – Ely – Cambridge – Stansted Airport – Stratford HS North – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel – Chichester – Portsmouth and Southsea – Gosport – Hythe – Southampton
- 2tphH Hull Paragon – Brigg – Gainsborough Central – Lincoln – Sleaford – Peterborough – Ely (reverse) – Norwich
- 2tphH Cleethorpes – Grimsby Town – Market Rasen – Lincoln – Newark Northgate –:
  Skegness – Wainfleet – Boston – Sleaford –:
  Grantham (joins / splits) – Peterborough – March – Ely – Cambridge – Stansted Airport – Stratford HS North – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel (splits / joins) – :
  – Bognor
  – Littlehampton
- 2tphH Edinburgh Waverley – Drem – Dunbar – Berwick-upon-Tweed – Alnmouth – Morpeth – Newcastle – Durham – Darlington –:
  Newcastle – Sunderland – Seaham – Hartlepool – Stockton – Eaglescliffe – Yarm – Northallerton –:
  York (joins / splits) – Doncaster – Peterborough – Ely – Cambridge – Stansted Airport – Stratford HS North – St. Pancras (East)
- 2tphH Leeds City – Wakefield Westgate – Doncaster – Retford – Newark Northgate – Grantham – Peterborough – Ely – Cambridge – Stansted Airport – Stratford HS North – Stratford HS North – St. Pancras (East)

Regional Metro:

- 2tphR Harwich Town – Harwich International – Ipswich – Bury St. Edmunds – Ely – March – Peterborough – Stamford – Oakham – Melton Mowbray – Leicester – Hinckley – Nuneaton – Coleshill Parkway – Birmingham New Street – University – Bromsgrove – Droitwich Spa – Worcester Shrub Hill
- 2tphR Morecambe – Lancaster – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Rd. – Manchester Piccadilly – Stockport – Chinley – Sheffield Midland (reverse) – Chesterfield – Alfreton and Mansfield Parkway – Langley Mill – Nottingham – Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely (split/joins):
  – (reverse) Thetford – Wymondham – Norwich
  – Cambridge – Stansted Airport

- 2tphRS Peterborough – Whittlesea – March – Manea – Ely – Kennett – Bury St. Edmunds – Thurston – Elmswell – Stowmarket – Needham Market – Ipswich

HS7 North of Birmingham:

- 2tphH Newcastle – Consett – Durham (Relly Mill) – Darlington –:
  Middlesborough – Thornaby – Eaglescliffe – Yarm – Northallerton – :
  York HS (joins / splits) – Leeds HS – Huddersfield – Sheffield HS – Derby – Birmingham Interchange – Worcester Shrub Hill – Cheltenham Spa – Bristol Parkway – Bristol Temple Meads – Taunton – Exeter St. David's – Plymouth
- 2tphH Norwich – Ely (reverse) – Peterborough – Nottingham – Derby – Birmingham Interchange – Worcester Shrub Hill – Cheltenham Spa – Bristol Parkway – Newport – Cardiff Central – Cardiff (Rhoose) Airport – Bridgend – Port Talbot – Neath – Swansea
- 2tphH York HS – Leeds HS – Huddersfield – Sheffield HS – Derby – Birmingham HS.
- 2tphH Halifax – Bradford Central - Shipley – Leeds City –:
  Skipton – Keighley – Shipley – Leeds City –:
  (joins / Splits) – South Yorkshire HL – Sheffield Midland – Chesterfirld – Derby – Birmingham HS.
- 2tphH Cleethorpes – Grimsby Town – Market Rasen – Lincoln – Newark Castle – Nottingham – Derby – Birmingham HS.
- 2tphH Skegness – Wainfleet – Boston – Sleaford – Lincoln – Newark Castle – Nottingham – Derby – Birmingham HS.

The Southern Transpennine services, HS and RM, all connect at Sheffield HS / Midland. The HS services have cross-platform interchange and the RM services have longer stops to allow for platform change. But there are exceptions to be noted: the HS3 service from Barnsley / South Yorkshire to Tunbridge Wells, and the HS7 service from Halifax / Skipton to Birmingham HS, both travel via Sheffield Midland, joining HS3 at Huthwaite Junction. The Representative Hourly Pattern is:

00H Preston – Norwich
H HS3 York – Pancras Cross [HS5 –> Brighton] (HS Metro)

05H HS3 Barnsley / South Yorkshire LL – Pancras Cross [HS5 –> Tunbridge Wells] (UHS)
(no connection) *(Sheffield Midland)*

10H HS7 Newcastle / Middlesborough – Plymouth
H HS7 Halifax / Skipton – Birmingham HS *(Sheffield Midland)*
R Blackpool – Cleethorpes

15H HS3 Preston – Pancras Cross [HS5 –> Brighton] (HS Metro)
R Liverpool – Skegness

20R Morecambe – Norwich / Stansted Airport
(no connection)

25H Liverpool – Pancras Cross {HS5 –> Tunbridge Wells] (UHS)
H HS7 York – Birmingham HS

– repeating at 30, 35, 40, 45, 50 and 55 minutes past.

Representative Hourly Cross-Platform Interchange Pattern at Nottingham:

00H Preston – Norwich
H HS3 York – Pancras Cross [HS5 –> Brighton] (HS Metro)

07H HS7 Newcastle / Middlesborough – Plymouth
H HS7 Birmingham – Cleethorpes

15H HS3 Preston – Pancras Cross [HS5 –> Brighton] (HS Metro)
R Morecambe – Norwich / Stansted Airport

23H HS7 Birmingham – Skegness
(no connection)

– repeating at 30, 37, 45 and 53 minutes past.

Service plan 2 imposes the following loadings on HS8:

- Liverpool Lime St. – Kenyon West Junction 13tph
- Kenyon West Junction – Kenyon South Junction 2tph
- Kenyon West Junction – Kenyon North Junction 1tph
- Kenyon West Junction – Broughton Junction 10tph
- Preston – Gibb Farm Junction 14tph
- Gibb Farm Junction – Kenyon North Junction 4tph
- Gibb Farm Junction – Broughton Junction 10tph
- Broughton Junction – Guide Bridge HS Junction 20tph
- Guide Bridge HS Junction – Ladybower Junction 12tph
- Paddock Junction – Ladybower Junction 6tph
- Ladybower Junction – Woodburn HS Junction 18tph
- Woodburn HS Junction – Waleswood Junction 18tph
- Waleswood Junction – Wales Junction 14tph
- Wales Junction – Huthwaite Junction 26tph
- Huthwaite Junction – Nuthall North Junction 32tph
- Nuthall North Junction – Nuthall South Junction 24tph
- Nuthall South Junction – Strelley Junction 6tph
- Strelley Junction – Nottingham HS station 18tph
- Nottingham HS station – Manvers St. Junction 18tph
- Manvers St. Junction – Edwalton Junction 18tph
- Edwalton Junction – Asfordby Junction 12tph
- Asfordby Junction – Wymondham East Junction 4tph
- Wymondham East Junction – Thurlby Junction 4tph
- Thurlby Junction – Pellett Hall Junction 8tph
- Pellett Hall Junction – Peterborough Station (Midland lines) 18tph
- Peterborough station – Ely 18tph

Northern Transpennine Services:

HS9:

- 2tphH Liverpool Lime Street – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – York HS (splits / joins) –:
  – Darlington – Durham (Relly Mill) – Consett – Newcastle
  – Northallerton – Yarm – Eaglescliffe – Thornaby – Middlesborough
- 2tphH Liverpool Lime Street – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – York – Thirsk – Northallerton – Yarm – Eaglescliffe – Stockton – Hartlepool – Seaham – Sunderland – Newcastle
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – Selby – Gilberdyke – Hull
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – York – Malton – Rillington Junction (for 68/80+NYMR) – Seamer – Scarborough

Regional Metro:

(Note that **all** these services have the stopping pattern: Salford Central – Manchester Victoria – Stalybridge – Diggle – Marsden – Huddersfield – Mirfield – Dewsbury – Batley – Leeds City, which will not be repeated):

- 2tphR Chester – Helsby – Warrington Bank Quay – Newton le Willows – Salford Central —> Leeds City – Wetherby – Harrogate – Ripon – Northallerton – Yarm – Eaglescliffe – Stockton – Hartlepool – Seaham – Sunderland – Newcastle
- 2tphR Southport – Wigan Wallgate – Bolton – Salford Crescent – Salford Central —> Leeds City – Wetherby – Harrogate – Ripon – Northallerton – Yarm – Eaglescliffe – Thornaby – Middlesborough
- 2tphR Liverpool Lime St. – St. Helen's Junction – Newton le Willows – Salford Central —> Leeds City – Micklefield – York – Strensall – Malton – Rillington (NYMR) – Seamer – Scarborough
- 2tphR Blackpool North – Poulton le Fylde – Kirkham – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Salford Central —> Leeds City –Micklefield – Selby – Brough – Hull

The extracts from other routes' service plans given previously for Southern Transpennine in most cases affect HS9 also. They are not repeated here.

The Northern Transpennine services, HS and RM, all connect at Huddersfield. The HS services have cross-platform interchange and the RM services have longer stops to allow for platform change. The Representative Hourly Pattern is:

00H Liverpool – Newcastle / Middlesborough
H Preston – Scarborough
R Blackpool – Hull

07H [HS5 Brighton –>] HS3 Pancras Cross – York (HS Metro)
H Liverpool – Newcastle (via Stockton)
R Southport – Middlesborough

15H HS7 Plymouth – Newcastle
H Preston – Hull
R Liverpool – Scarborough

23H HS7 Birmingham HS – York
R Chester – Newcastle (via Stockton)

Service plan 2 imposes the following loadings on HS9:

- Guide Bridge HS Junction – Paddock Junction 8tph
- Paddock Junction – Gelderd Rd. North Junction 14tph
- Gelderd Rd. North Junction – Garforth West Junction 16tph
- Garforth West Junction – Micklefield HS Junction 6tph
- Garforth West Junction – Garforth East Junction 10tph
- Garforth East Junction – York HS station 16tph
- York HS station – Poppleton Junction 18tph
- Poppleton Junction – Romanby Junction 24tph
- Romanby Junction – Derwent Hill Junction 10tph
- Derwent Hill Junction – Paradise Junction 8tph
- Paradise Junction – Newcastle station 12tph

Estimated Journey Times

The conditions governing acceleration, deceleration, behaviour at junctions and line capacity of high speed lines are dealt with exhaustively in appendix B of the article 'Same Speed Railways'. Technically-minded readers, who want all the hard details, should look there. Only the required results are quoted here.

The following calculations are only approximate. Distances, to the nearest km, are derived from my own maps. However, comparing my estimated distances with actual distances, where these are appropriate, (thus Darlington – York my estimate 70km, actual 70.4km, Durham Relly Mill – Darlington, my estimate 33km, actual former Relly Mill Junction – Darlington 33.6km,) leads me to believe they are accurate to well within 2%.

The crudest approximation, usually, is the assumption that, once line speed has been reached, that speed (300kph) is maintained until it becomes necessary to decelerate for a junction or a station stop. The Trans-Pennine routes are in fact the ones where I am least confidant of this assumption, because of their unavoidable curvature.

The results are, in any case, valuable in giving a **feel** for the journey times possible.

Two versions are produced for each table, the summary version, containing results only for stations at which the service stops, and any locations, (invariably junctions,) where there is a change of line speed. The second version, suffixed P, contains the same results as previously, and, in addition, *passing times* (so indicated) for all other locations which are of interest for one reason or another.

My estimated distances are:

• Liverpool Lime St. – Victoria LL	49km	(360kph)
• Liverpool Lime St. – Kenyon West Junction	29km	(360kph)
• Kenyon West Junction – Victoria LL	20lm	(360kph
• Preston – Bolton	32km	(360kph)
• Preston – Gibb Farm Junction	24km	(360kph)
• Gibb Farm Junction – Bolton	8km	(360kph *)
• Bolton – Victoria LL	17km	(360kph *)
• Victoria LL – Manchester HS	0.5km	(*)
• Manchester HS – Huddersfield	39km	(300kph)
• Manchester HS – Guide Bridge HS Junction	8km	(300kph *)
• Guide Bridge HS Junction – Huddersfield	31km	(300kph)
• Huddersfield – Leeds New Lane	24km	(300kph)
• Leeds New Lane – Garforth West Junction	10km	(360kph *)
• Garforth West Junction – Micklefield	6km	(230kph)
• Garforth West Junction – Garforth East Junction	0.82km	(*)
• Garforth East Junction – Ulleskelf Junction	15km	(360kph)
• Ulleskelf Junction –York HS	14km	(225kph)
• York HS – Romanby Junction	46km	(225kph)
• Romanby Junction – Darlington	24km	(360kph)
• Darlington – Durham Relly Mill	33km	(300kph)
• Durham Relly Mill – Consett	20km	(300kph)

- Consett – Newcastle 20km (360kph)
- Consett – Derwent Hill Junction 2km (300kph)
- Derwent Hill Junction – Paradise Junction 15km (300kph)
- Paradise Junction – Newcastle 3km (300kph)
- Manchester HS – Sheffield HS 54km (300kph)
- Manchester HS – Guide Bridge HS Junction 8km (300kph *)
- Guide Bridge HS Junction – Ladybower Junction 29km (300kph)
- Huddersfield – Sheffield HS 51km (300kph)
- Huddersfield – Ladybower Junction 34km (300kph)
- Ladybower Junction – Sheffield HS 17km (300kph)
- Sheffield HS – Woodburn HS Junction 1.55km (225kph)
- Woodburn HS Junction – Waleswood Junction 9.0km (225kph)
- Sheffield HS – Waleswood Junction 10.55km (225kph)
- Waleswood Junction – Wales Junction 0.74km (230kph)
- Wales Junction – Nottingham HS 50.38km (360kph)
- Wales Junction – Nuthall South Junction 43km (360kph)
- Wales Junction – Huthwaite Junction 25km (360kph)
- Huthwaite Junction – Nuthall North Junction 13.5km (360kph)
- Nuthall North Junction – Nuthall South Junction 4.5km (360kph)
- Nuthall South Junction – Strelley Junction 0.38km (*)
- Strelley Junction – Nottingham HS 7km (*)
- Nottingham HS – Melton Mowbray 30.1km (225kph)
- Nottingham HS – Edwalton Junction 6.8km (225kph)
- Edwalton Junction – Melton Mowbray 23.3km (225kph)
- Edwalton Junction – Asfordby Junction 19.6km (225kph)
- Asfordby Junction – Melton Mowbray 3.7km (225kph)
- Melton Mowbray – Wymondham East Junction 8km (160kph)
- Wymondham East Junction – Peterborough 45.3km (300kph)
- Wymondham East Junction – Thurlby Junction 27km (300kph)
- Thurlby Junction – Pellett Hall Junction 12km (300kph)
- Pellett Hall Junction – Peterborough 6.3km (225kph)
- Ely – Brandon Junction 18km (225kph)
- Brandon Junction – Roudham Heath Junction 24km (300kph)
- Roudham Heath Junction – Norwich 40km (200kph)

The above are all distances on HS8/HS9/HS3/HS6's new infrastructure. In addition, they share the following sections of classic routes, whose lengths are known exactly!

- Peterborough – March 23.9km (225kph)
- March – Ely 25.1km (225kph)
- Micklefield – Church Fenton 8.2km (225kph)
- Church Fenton – Holgate Junction 16.6km (225kph)
- Holgate Junction – York ECML 0.7km (*)
- York ECML – Barton Hill 18.7km (200kph)
- Barton Hill – Malton 15.3km (100kph)

- Malton – Rillington Junction (NYMR) 7.1km (200kph *)
- Rillington Junction – Seamer 21.9km (200kph)
- Seamer – Scarborough 4.7km (160kph *)
- Micklefield – Selby 18.2km (200kph)
- Selby – Gilberdyke 22.6km (200kph)
- Gilberdyke – Hull Paragon 27.3km (200kph)
- York – Thirsk 35.7km (225kph)
- Thirsk – Northallerton 12.5km (225kph)
- York ECML – Northallerton 48.2km (225hph)
- Northallerton – Yarm 19.4km (225kph)
- Yarm – Eaglescliffe 4.1km (*)
- Eaglescliffe – Thornaby 4.8km (*)
- Thornaby – Middlesborough 5.2km (*)
- Eaglescliffe – Stockton 4.9km (160kph *)
- Stockton – Hartlepool 18.8km (160lph)
- Hartlepool – Seaham 20.7km (160kph)
- Seaham – Sunderland 8.3km (160kph)
- Sunderland – Newcastle 19.6km (160kph)

The line speeds are chosen as follows:

- HS8/HS9 new infrastructure has a line speed of 360kph (for those sections shared with HS3) and 300kph elsewhere, except for the section between Wymondham West Junction and Pellett Hall junctions, where the speed is 225kph.
- The section of classic route between Edwalton Junction and Melton Mowbray is merged into HS8, and upgraded to 225kph.
- Those sections marked (*) are between Adjacent Stations, or between a station and a propinquant junction. For these sections, the elapsed time is derived from tables and stated explicitly. Refer to the article ‘Same Speed Railways (Appendices C and D) for the necessary explanations and values; only those values are stated here.

Acceleration/deceleration distances and times (taken from ‘Same Speed Railways’ appendix B) are:

- Acceleration from stationary to 360kph, 225mph, takes 16.67km and 333 seconds
- Acceleration from stationary to 300kph, 187.5mph, takes 11.57km and 278 seconds
- Acceleration from stationary to 230kph, 143.8mph, takes 6.80km and 213 seconds
- Acceleration from stationary to 225kph, 140mph, takes 6.51km and 208 seconds
- Acceleration from stationary to 200kph, 125mph, takes 5.14km and 185 seconds
- Acceleration from stationary to 160kph, 100mph, takes 3.29km and 148 seconds
- Deceleration from 360kph to stationary takes 10.00km and 200 seconds
- Deceleration from 300kph to stationary takes 6.945km and 167 seconds
- Deceleration from 2300kph to stationary takes 4.08km and 128 seconds
- Deceleration from 225kph to stationary takes 3.91km and 125 seconds

- Deceleration from 200kph to stationary takes 3.07km and 111 seconds
- Deceleration from 160kph to stationary takes 1.98km and 89 seconds
- Time to travel from Gibb Farm Junction to Bolton (8km pass to stop) is 184 seconds
- Time to travel from Bolton to Victoria LL (17km start to stop) is 426 seconds
- Time to travel from Manchester Victoria LL to M/C HS (0.5km start to stop) is 73 seconds
- Time to travel from Manchester HS to Guide Bridge HS Jn. (8km start to pass) is 231 seconds
- Time to travel from Leeds New Lane to Garforth East Jn. (10km start to pass) is 260 seconds
- Time to travel from Nuthall South Jn. to Strelley Jn. (0.38km pass to pass) is 6 seconds
- Time to travel from Strelley Junction to Nottingham HS (7km pass to stop) is 170 seconds
- Time to travel from Nottingham HS – Edwalton Junction (7km start to pass) is 216 seconds
- Time to travel from Yarm to Eaglescliffe (4.1km start to stop) is 209 seconds
- Time to travel from Eaglescliffe to Stockton (4.9km start to stop) is 229 seconds
- Time to travel from Eaglescliffe to Thornaby (4.8km start to stop) is 226 seconds
- Time to travel from Thornaby to Middlesborough (5.2km start to stop) is 235 seconds
- Time to travel from Malton to Rillington Junction (7.1km start to stop) is 275 seconds
- Time to travel from Seamer to Scarborough (4.7km start to stop) is 224 seconds
- Time penalty at Ladybower Junction for services to / from Huddersfield = 14 seconds

Whereas it is useful to quote the specific values input explicitly to the journey time spreadsheets for the routes dealt with in the current article, there is no point in describing the methodology other than at the most superficial level. The calculation of journey times is described in full and exhaustive detail in Appendix C of the ‘Same Speed Railways’ article, and Appendix D of the same article lists all the explicit times encountered throughout the network, explaining precisely what they are and why they are specified explicitly. To reproduce this information would inflate the current article (and every other Route and Service Plans article) by some forty-odd pages with negligible benefit – they’re long enough anyway. The general reader needs to be interested only in the results. Those geeks who just have to have the really raw, hard-core stuff know where they can find it. (As a fully-paid-up geek myself, I love this stuff and it has been an immense pleasure and satisfaction to derive and document it, but I don’t kid myself that it’s of interest to more than a handful of people in the UK, or indeed the world. Nor need it be.)

Note that the section between Paddock and Ladybower junctions, though clearly part of HS8 (what else could it reasonably be, except possibly HS9, for which the same remarks apply) carries no actual HS8 services. The services over this section are all either HS3 or HS7.

1. Northern Transpennine: Liverpool Lime St. – Newcastle / Middlesborough / Newcastle via Hartlepool (8/9/14 stops):

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	49.0	49.0	12.6	12.6	12.6
Victoria LL - Manchester HS	0.5	49.5	1.2	13.8	16.8
Manchester HS - Guide Bridge HS Junction	8.0	57.5	3.9	17.7	
Guide Bridge HS Junction - Huddersfield	31.0	88.5	7.7	25.4	31.4
Huddersfield - Leeds HS	24.0	112.5	8.5	33.9	42.9
Leeds HS - Garfield East Jn.	10.8	123.3	4.5	38.5	
Garfield East Jn. - Ulleskelf Jn.	15.0	138.3	3.1	41.6	
Ulleskelf Junction - York HS	14.0	152.3	4.8	46.4	58.4
York HS - Romanby Junction	46.0	198.3	14.0	60.4	
Romanby Junction - Darlington Bank Top	24.0	222.3	6.1	66.5	85.5
Darlingham Bank Top - Durham Relly Mill	33.0	255.3	10.3	76.8	98.8
Durham Relly Mill - Consett	20.0	275.3	7.7	84.5	109.5
Consett - Newcastle	20.0	295.3	7.7	92.2	120.2
York HS - Northallerton	48.2	200.5	15.6	62.0	82.0
Northallerton - Yarm	19.5	220.0	8.0	70.0	93.0
Yarm - Eaglescliffe	4.1	224.1	3.5	73.5	99.5
Eaglescliffe - Thornaby	4.9	229.0	3.8	77.2	106.2
Thornaby - Middlesborough	5.2	234.2	3.9	81.1	113.1
Leeds HS - Garforth West Jn.	10.0	122.5	4.3	38.3	
Garforth West Jn. - Micklefield	6.0	128.5	2.6	40.9	52.9
Micklefield - York (ECML)	25.5	154.0	9.6	50.5	65.5
York (ECML) - Thirsk	35.7	189.7	12.3	62.8	80.8
Thirsk - Northallerton	12.5	202.2	6.1	68.9	89.9
Northallerton - Yarm	19.4	221.6	8.0	76.8	100.8
Yarm - Eaglescliffe	4.1	225.7	3.5	80.3	107.3

Eaglescliffe - Stockton	4.9	230.6	3.8	84.1	114.1
Stockton - Hartlepool	18.8	249.4	9.0	93.1	126.1
Hartlepool - Seaham	20.7	270.1	9.7	102.9	138.9
Seaham - Sunderland	8.3	278.4	5.1	108.0	147.0
Sunderland - Newcastle	19.6	298.0	9.3	117.3	159.3

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

- Manchester (Vic.) 32 [13]
- Manchester (Pic/HS) 45 [17]
- Huddersfield 68 [31]
- Leeds 88 [43]
- Micklefield 118 (1 change) [53]
- York 114 [58/66]
- Darlington 148 [86]
- Durham 165 [99]
- Consett [110] (there is no current time for Consett!)
- Newcastle 180 [120/159]
- Thirsk 139 (1 change) [81]
- Northallerton 136 [82/90]
- Yarm 162 (1 change) [93/101]
- Eaglescliffe 172 (1 change) [100/107]
- Thornaby 170 (1 change) [106]
- Middlesborough 180 (1 change) [113]
- Stockton 188 (2 changes) [114]
- Hartlepool 192 (1 change) [126]
- Seaham 225 (1 change) [139]
- Sunderland 217 (1 change) [147]

1P. Northern Transpennine: Liverpool Lime St. – Newcastle / Middlesborough / Newcastle via Hartlepool (8/9/14 stops; with passing times):

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. - *Kenyon West Junction (pass)*	29.0	29.0	7.6	*7.6*	*7.6*
Kenton West Junction (pass) - Victoria LL	20.0	49.0	5.0	12.6	12.6
Victoria LL - Manchester HS	0.5	49.5	1.2	13.8	16.8
Manchester HS - *Guide Bridge HL Jn. (pass)*	8.0	57.5	3.9	*17.7*	*23.7*
Guide Bridge HL Jn. (pass) - Huddersfield	31.0	88.5	7.7	17.7	31.4
Huddersfield - Leeds HS	24.0	112.5	8.5	26.2	42.9
Leeds HS - *Garforth West Junction (pass)*	10.0	122.5	4.3	*30.5*	*50.3*
Garforth West Jn. (pass) - Garforth East Jn. (pass	0.8	123.3	0.2	*30.7*	*50.5*
Garforth East Jn. (pass) - Ulleskelf Jn. (pass)	15.0	138.3	3.1	*33.8*	*53.6*
Ulleskelf Junction (pass) - York HS	14.0	152.3	4.8	38.6	58.4
York HS - *Romanby Junction (pass)*	46.0	198.3	14.0	*52.6*	*79.4*
Romanby Junction (pass) - Darlington Bank Top	24.0	222.3	6.1	58.7	85.5
Darlingham Bank Top - Durham Relly Mill	33.0	255.3	10.3	69.0	98.8
Durham Relly Mill - Consett	20.0	275.3	7.7	76.7	109.5
Consett - *Derwent Hill Junction (pass)*	2.0	277.3	1.9	*78.7*	*114.4*
Derwent Jill Jn. (pass) - Paradise Jn. (pass)	15.0	292.3	4.0	*82.6*	*118.3*
Paradise Junction (pass) - Newcastle	3.0	295.3	1.8	84.4	120.2
York HS - Northallerton	48.2	200.5	15.6	54.3	82.0
Northallerton - Yarm	19.4	219.9	8.0	62.2	92.9
Yarm - Eaglescliffe	4.1	224.0	3.5	65.7	99.4
Eaglescliffe - Thornaby	4.8	228.8	3.8	69.5	106.2
Thornaby -	5.2	234.0	3.9	73.4	113.1

Middlesborough					
Leeds HS - *Garforth West Jjunction (pass)*	10.0	122.5	4.3	*30.5*	*50.3*
Garforth West Junction (pass) - Micklefield	6.0	128.5	2.6	33.1	52.9
Micklefield - York (ECML)	25.5	154.0	9.6	42.7	65.5
York (ECML) - Thirsk	35.7	189.7	12.3	55.0	80.8
Thirsk - Northallerton	12.5	202.2	6.1	61.1	89.9
Northallerton - Yarm	19.4	221.6	8.0	69.1	100.8
Yarm - Eaglescliffe	4.1	225.7	3.5	72.6	107.3
Eaglescliffe - Stockton	4.9	230.6	3.8	76.4	114.1
Stockton - Hartlepool	18.8	249.4	9.0	85.4	126.1
Hartlepool - Seaham	20.7	270.1	9.7	95.1	138.9
Seaham - Sunderland	8.3	278.4	5.1	100.2	147.0
Sunderland - Newcastle	19.6	298.0	9.3	109.6	159.3

2. Northern Transpennine: Preston – Hull / Scarborough (8/10 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Liverpool, inc. Station Wait Times
Preston - Gibb Farm Junction	24.0	24.0	7.0	7.0	7.0
Gibb Farm Junction - Bolton	8.0	32.0	3.1	10.1	10.1
Bolton - Victoria LL	17.0	49.0	7.1	17.2	20.2
Victoria LL - Manchester HS	0.5	49.5	1.2	18.4	24.4
Manchester HS - Guide Bridge HS Junction	8.0	57.5	3.9	22.2	
Guide Bridge HS Junction - Huddersfield	31.0	88.5	7.7	30.0	39.0
Huddersfield - Leeds HS	24.0	112.5	8.5	38.5	50.5
Leeds HS - Garforth West Jn.	10.0	122.5	4.3	42.8	
Garforth West Jn. - Micklefield	6.0	128.5	2.6	45.4	60.4
Micklefield - Selby	18.2	146.7	7.9	53.4	71.4
Selby - Gilberdyke	22.6	169.3	9.2	62.6	83.6
Gilberdyke - Hull Paragon	27.3	196.6	10.7	73.3	97.3
Micklefield - York (ECML)	25.5	154.0	9.6	55.0	73.0
York (ECML) - Barton Hill	18.7	172.7	7.4	62.4	
Barton Hill - Malton	15.3	188.0	4.7	67.1	88.1
Malton - Rillington Junction	7.1	195.1	4.6	71.7	95.7
Rillington Junction - Seamer	21.9	217.0	9.0	80.7	107.7
Seamer - Scarborough	4.7	221.7	3.7	84.5	114.5

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

- Bolton 26 [10]
- Manchester (Vic.) 49 [20]
- Manchester (Pic/HS) 41 [24]
- Huddersfield 75 (1 change) [39]
- Leeds 74 [51]
- Micklefield 124 [60]
- Selby 130 (1 change) [71]
- Gilberdyke 161 (2 changes) [84]
- Hull Paragon 168 (1 change) [97]

- York 139 (2 changes) [73]
- Malton 157 (1 change) [88]
- Seamer 174 (1 change) [108]
- Scarborough 182 (1 change) [115]

2P. Northern Transpennine: Preston – Hull / Scarborough (8/10 stops; with passing times):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Liverpool, inc. Station Wait Times
Preston - *Gibb Farm Junction (pass)*	24.0	24.0	7.0	*7.0*	*7.0*
Gibb Farm Junction (pass) - Bolton	8.0	32.0	3.1	10.1	10.1
Bolton - Victoria LL	17.0	49.0	7.1	17.2	20.2
Victoria LL - Manchester HS	0.5	49.5	1.2	18.4	24.4
Manchester HS - *Guide Bridge HS Junction (pass)*	8.0	57.5	3.9	*22.2*	*31.2*
Guide Bridge HS Junction (pass) - Huddersfield	31.0	88.5	7.7	30.0	39.0
Huddersfield - Leeds HS	24.0	112.5	8.5	38.5	50.5
Leeds HS - *Garforth West Junction (pass)*	10.0	122.5	4.3	*42.8*	*57.8*
Garforth West Junction (pass) - Micklefield	6.0	128.5	2.6	45.4	60.4
Micklefield - Selby	18.2	146.7	7.9	53.4	71.4
Selby - Gilberdyke	22.6	169.3	9.2	62.6	83.6
Gilberdyke - Hull Paragon	27.3	196.6	10.7	73.3	97.3
Micklefield - York (ECML)	25.5	154.0	9.6	55.0	73.0
York (ECML) - *Barton Hill (pass)*	18.7	172.7	7.4	*62.4*	*83.4*
Barton Hill (pass) - Malton	15.3	188.0	4.7	67.1	88.1
Malton - Rillington Junction	7.1	195.1	4.6	71.7	95.7
Rillington Junction - Seamer	21.9	217.0	9.0	80.7	107.7
Seamer - Scarborough	4.7	221.7	3.7	84.5	114.5

3. Southern Transpennine: Preston – Norwich (9 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - Gibb Farm Junction	24.0	24.0	7.0	7.0	
Gibb Farm Junction - Bolton	8.0	32.0	3.1	10.1	10.1
Bolton - Victoria LL	17.0	49.0	7.1	17.2	20.2
Victoria LL - Manchester HS	0.5	49.5	1.2	18.4	24.4
Manchester HS - Sheffield HS	54.0	103.5	14.5	32.9	41.9
Sheffield HS - Wales Junction	11.3	114.8	4.7	37.6	
Wales Juntion - Nuthall South Junction	43.0	157.8	7.8	45.5	
Nuthall South Junction - Nottingham	7.4	165.2	2.9	48.4	60.4
Nottingham - Melton Mowbray	30.1	195.3	10.8	59.2	74.2
Melton Mowbray - Wymondham East Jn.	8.0	203.3	4.2	63.4	
Wymondham East Jn. - Pellett Hall Junction	39.0	242.3	8.4	71.8	
Pellett Hall Junction - Peterborough	6.3	248.6	2.7	74.5	92.5
Peterborough - March	23.9	272.5	9.2	83.7	104.7
March - Ely (reverse)	25.1	297.6	9.5	93.2	117.2
Ely - Brandon Junction	18.0	315.6	6.5	99.7	
Brandon Junction - Roudham Heath Junction	24.0	339.6	5.1	104.8	
Roudham Heath Junction - Norwich	40.0	379.6	12.9	117.7	146.7

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

- Bolton 26 [10]
- Manchester (Vic) 49 [20]
- Manchester (Pic/HS) 41 [24]
- Sheffield 107 (1 change) [42]
- Nottingham 160 (1 change) [61]
- Melton Mowbray 197 (1 change) [74]

- Peterborough 201 (3 changes) [93]
- March 236 (1 change) [105]
- Ely 266 (2 changes) [117]
- Norwich 290 (2 changes) [147]

3P. Southern Transpennine: Preston – Norwich (9 stops; with passing times):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - *Gibb Farm Junction (pass)*	24.0	24.0	7.0	*7.0*	*7.0*
Gibb Farm Junction (pass) - Bolton	8.0	32.0	3.1	10.1	10.1
Bolton - Victoria LL	17.0	49.0	7.1	17.2	20.2
Victoria LL - Manchester HS	0.5	49.5	1.2	18.4	24.4
Manchester HS - *Guide Bridge HS Jn. (pass)*	8.0	57.5	3.9	*22.3*	*31.3*
Guide Bridge HS Jn. (pass) - Ladybower Jn. (pass)	29.0	86.5	5.8	*28.1*	*37.1*
Ladybower Junction (pass) - Sheffield HS	17.0	103.5	4.8	32.9	41.9
Sheffield HS - Woodburn HS Junction (pass)	1.6	105.1	0.1	*32.9*	*44.9*
Woodburn HS Jn, (pass) - Waleswood Junction (pass)	9.0	114.1	4.5	*37.5*	*49.5*
Waleswood Juntion (pass) - Wales Junction (pass)	0.7	114.8	0.2	*37.7*	*49.7*
Wales Junction (pass) - Huthwaite Junction (pass)	25.0	139.8	4.6	*42.2*	*54.2*
Huthwaite Jn. (pass) - Nuthall North Jn. (pass)	13.5	153.3	2.3	*44.5*	*56.5*
Nuthall North Jn. (pass) - Nuthall South Jn. (pass)	4.5	157.8	1.0	*45.4*	*57.4*
Nuthall South Jn. (pass) - Strelley Junction (pass)	0.4	158.2	0.1	*45.5*	*57.5*
Strelley Junction (pass) - Nottingham	7.0	165.2	2.8	48.4	60.4
Nottingham - *Edwalton Junction (pass)*	6.8	172.0	3.5	*51.9*	*66.9*
Edwalton Junction (pass) - Asfordby Junction (pass)	19.6	191.6	5.2	*57.1*	*72.1*

Asfordby Junction (pass) - Melton Mowbray	3.7	195.3	2.0	59.2	74.2
Melton Mowbray - *Wymondham East Jn. (pass)*	8.0	203.3	4.2	*63.4*	*81.4*
Wymondham East Jn. (pass - Thurlby Junction (pass)	27.0	230.3	5.9	*69.3*	*87.3*
Thurlby Junction (pass) - Pellett Hall Junction (pass)	12.0	242.3	2.5	*71.8*	*89.8*
Pellett Hall Junction (pass) - Peterborough	6.3	248.6	2.7	74.5	92.5
Peterborough - March	23.9	272.5	9.2	83.7	104.7
March - Ely (reverse)	25.1	297.6	9.5	93.1	117.1
Ely - *Brandon Junction (pass)*	18.0	315.6	6.5	*99.7*	*128.7*
Brandon Junction (pass) - Roudham Heath Jn. (pass)	24.0	339.6	5.1	*104.8*	*133.8*
Roudham Heath Junction (pass) - Norwich	40.0	379.6	12.9	117.7	146.7

HS8 Mk2 Enhancements

Apart from the quadrupling between Broughton and Guide Bridge HS junctions, the only changes are to HS8's Ely arm:

- The Melton Mowbray avoiding line between Asfordby and Wymondham East junctions is reinstated. It has an extra junction, Melton West Junction where a link diverges to join the Melton – Leicester route. This is foreseen as exclusively for freight traffic. The line speed is raised tp 300kph between Edwalton Junction and Wymondham East Junction via the avoiding line.
- HS8 now has its own tracks from Pellett Hall Junction into the new Peterborough HS, approached by tunnel. The line speed is raised to 300kph.
- The original new route between Peterborough and Ely is reinstated, but direct into Ely station, where services reverse in order to make connections. The original Ely avoiding line, direct to the Norwich line, is not reinstated. HS8's reinstated route via Wimblington has a line speed of 300kph.

Service Plan 3

The following new services are introduced:

HS8:

- 2tphH Liverpool Lime St. – (Manchester) Victoria LL – Manchester HS – Sheffield HS – Worksop – Retford LL – Gainsborough Central – Brigg – Hull Paragon
- 2tphH Liverpool Lime St. – (Manchester) Victoria LL – Manchester HS – Sheffield HS – Worksop – Retford LL – Gainsborough Lea Road – Lincoln – Sleaford – Boston – Wainfleet – Skegness (Note that this was formerly an RM service.)
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Sheffield HS – Worksop – Retford LL – Gainsborough Central – Brigg – Grimsby Town – Cleethorpes

There are no new services belonging to HS9.

HS3:

UHS:

- 2tphH Preston – Bolton – Manchester Victoria LL – Manchester HS – Sheffield HS – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West
- 2tphH Hull Paragon – Gilberdyke – Goole – Doncaster – South Yorkshire LL – Rotherham – Sheffield Midland – Chesterfield – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel HS – Chichester – Hayling Island – Portsmouth and Southsea
- 2tphH Barnsley –:
  South Yorkshire LL – Rotherham –:
  Sheffield Midland (joins / splits) – Chesterfield – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel HS – Chichester – Hayling Island – Portsmouth and Southsea

- 2tphH Derby – Nottingham – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel HS – Chichester – Hayling Island – Portsmouth and Southsea

HS Metro:

- Derby – Nottingham – Melton Mowbray (reverse) – Leicester – Northampton – Luton & Dunstable Parkway – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Hove Shoreham-by-Sea – Worthing – Chichester
- Derby – Nottingham – Melton Mowbray (reverse) – Leicester – Rugby (GC) Calvert – Princes Risborough – High Wycombe – Bourne End – Maidenhead – Slough – LHR Interchange – Old Oak Common – Paddington
- 2tphH Newcastle – Consett – Durham (Relly Mill) – Darlington –:
  Middlesborough – Thornaby – Eaglescliffe – Yarm – Northallerton – :
  York HS (joins / splits) – South Yorkshire HL – Nottingham – Leicester – Rugby (GC) – Banbury – Oxford – Reading Parkway HL – Basingstoke HS – Winchester – Southampton Airport Parkway – Southampton Central – Brockenhurst – Bournemouth Central – Bournemouth West

The full service plan is:

Non-Transpennine Services:

- 2tphH Liverpool Lime St. – Crewe – Old Oak Common – Euston Cross [–> Hastings – Eastbourne]
- 2tphH Preston – Crewe – Old Oak Common – Euston Cross [–> Hastings – Eastbourne]
- 1tphH Liverpool Lime St. – Preston (splits/joins) –
  – Oxenholme – Carlisle – Lockerbie – Haymarket – Edinburgh Waverley
  – Lancaster – Penrith – Carlisle – Lockerbie – Glasgow Central
- 1tphH Birmingham HS – Crewe – Preston (splits/joins) –
  – Oxenholme – Carlisle – Lockerbie – Haymarket – Edinburgh Waverley
  – Lancaster – Penrith – Carlisle – Lockerbie – Glasgow Central

Southern Transpennine Services:

HS8:

- 2tphH Liverpool Lime St. – (Manchester) Victoria LL – Manchester HS – Sheffield HS – Worksop – Retford LL – Gainsborough Central – Brigg – Hull Paragon
- 2tphH Liverpool Lime St. – (Manchester) Victoria LL – Manchester HS – Sheffield HS – Worksop – Retford LL – Gainsborough Lea Road – Lincoln – Sleaford – Boston – Wainfleet – Skegness (Note that this was formerly an RM service.)
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Sheffield HS – Worksop – Retford LL – Gainsborough Central – Brigg – Grimsby Town – Cleethorpes
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Sheffield HS – Nottingham – Melton Mowbray – Peterborough – March – Ely (reverse) – Norwich

Thar's all. The other services are HS3.

Regional Metro:

(Note that **all** these services have the stopping pattern: Manchester Oxford Rd. – Manchester Piccadilly – Stockport – Chinley – Sheffield Midland, which will not be repeated):

- 2tphR Morecambe – Lancaster – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland (reverse) – Chesterfield – Alfreton and Mansfield Parkway – Langley Mill – Nottingham – Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely (split/joins) –:
  – (reverse) Thetford – Wymondham – Norwich
  – Cambridge – Stansted Airport
- 2tphR Blackpool North – Poulton le Fylde – Kirkham – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland – South Yorkshire – Rotherham – Mexborough – Doncaster – Thorne South – Scunthorpe – Barnetby – Grimsby Town – Cleethorpes
- 2tphR Southport – Wigan Wallgate – Bolton – Salford Crescent – Manchester Oxford Rd. —> Sheffield Midland – South Yorkshire – Rotherham – Mexborough – Doncaster – Thorne North – Goole – Brough – Hull

(As noted above, The former RM service from Liverpool to Skegness is now HS.)

The following extracts from other routes' service plans include only those services which contribute to HS8's loadings. They are thus not complete SPs (though, in HS3's case, almost so).

HS3 Long Distance UHS:

- 2tphH Glasgow St. Enoch – Glasgow Bellgrove – Edinburgh Airport – Haymarket – Edinburgh Waverley HS – Hawick – Hexham – Consett – Durham (Relly Mill) – Darlington – York – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Lewes – Eastbourne
- 2tphH Glasgow St. Enoch – Glasgow Bellgrove – Edinburgh Airport – Haymarket – Edinburgh Waverley HS – Lauder – Hawick – Hexham – Newcastle
- 2tphH Carlisle – stations to Hexham – Newcastle
- 2tphH Newcastle – Consett – Durham (Relly Mill) – Darlington –:
  Middlesborough – Thornaby – Eaglescliffe – Yarm – Northallerton – :
  York HS (joins / splits) – South Yorkshire HL – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Lewes – Newhaven Town – Newhaven Marine
- 2tphH Liverpool Lime St. – (Manchester) Victoria LL – Manchester HS – Sheffield HS – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West
- 2tphH Preston – Bolton – (Manchester) Victoria LL – Manchester HS – Sheffield HS – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West
- 2tphH York HS – Leeds HS – Wakefield Westgate – South Yorkshire HL – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West
- 2tphH Halifax – Bradford City – Shipley –:
  Skipton – Keighley – Shipley –:
  Leeds City (joins / splits) – South Yorkshire HL – Pancras Cross – Victoria (LL) – East Croydon – Tonbridge – Tunbridge Wells – Tunbridge Wells West

- 2tphH Hull Paragon – Gilberdyke – Goole – Doncaster – South Yorkshire LL – Rotherham – Sheffield Midland – Chesterfield – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel HS – Chichester – Hayling Island – Portsmouth and Southsea
- 2tphH Barnsley –:
  South Yorkshire LL – Rotherham –:
  Sheffield Midland (joins / splits) – Chesterfield – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel HS – Chichester – Hayling Island – Portsmouth and Southsea
- 2tphH Derby – Nottingham – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel HS – Chichester – Hayling Island – Portsmouth and Southsea

Note that the service from Barnsley / South Yorkshire to Portsmouth and Southsea formerly terminated in Tunbridge Wells. Its former Tunbridge Wells slot has been taken over by the new service from Preston. Portsmouth and Southsea is a major new HS5 destination at Mk2.

HS3 Metro:

- 2tphH York HS – Leeds HS – Huddersfield – Sheffield HS – Nottingham – Leicester – Northampton – Luton & Dunstable Parkway – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Brighton
- 2tphH Preston – Bolton – (Manchester) Victoria (LL) – Manchester HS – Sheffield HS – Nottingham – Leicester – Northampton – Luton & Dunstable Parkway – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Brighton
- Derby – Nottingham – Melton Mowbray (reverse) – Leicester – Northampton – Luton & Dunstable Parkway – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Hove Shoreham-by-Sea – Worthing – Chichester
- Derby – Nottingham – Melton Mowbray (reverse) – Leicester – Rugby (GC) Calvert – Princes Risborough – High Wycombe – Bourne End – Maidenhead – Slough – LHR Interchange – Old Oak Common – Paddington
- 2tphH Newcastle – Consett – Durham (Relly Mill) – Darlington –:
  Middlesborough – Thornaby – Eaglescliffe – Yarm – Northallerton – :
  York HS (joins / splits) – South Yorkshire HL – Nottingham – Leicester – Rugby (GC) – Banbury – Oxford – Reading Parkway HL – Basingstoke HS – Winchester – Southampton Airport Parkway – Southampton Central – Brockenhurst – Bournemouth Central – Bournemouth West

MML and other Regional Metro:

- 2tphR St. Pancras – St. Albans – Luton Airport Parkway – Luton – Bedford – Wellingborough – Kettering – Corby – Oakham – Melton Mowbray – Nottingham – Langley Mill – Alfreton & Mansfield Parkway – Chesterfield – Sheffield Midland – Rotherham – Pontefract – York
  (note that this uses HS3 on the approach to Nottingham)
- 2tphR Worcester Shrub Hill – Droitwich Spa – Bromsgrove – University – Birmingham New St. – Coleshill Parkway – Nuneaton – Hinckley – Leicester – Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely – Bury St. Edmunds – Ipswich – Harwich International – Harwich Town
- 2tphR Morecambe – Lancaster – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Road – Manchester Piccadilly – Stockport – Chinley – Sheffield (reverse) – Chesterfield – Alfreton and Mansfield Parkway – Langley Mill – Nottingham

– Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely (splits / joins) – :
– (reverse at Ely) Thetford – Wymondham –Ely (reverse) – Norwich
– Cambridge – Stansted Airport

- 2tphR Edinburgh Waverley – Drem – Dunbar – Berwick-upon-Tweed – Alnmouth – Morpeth – Newcastle – Chester le Street – Durham – Darlington – Northallerton – Thirsk – York

HS6 West of Ely, and HS10:

- 2tphH Hull Paragon – Brigg – Gainsborough Central – Lincoln – Sleaford – Peterborough – Ely – Cambridge – Stansted Airport – Stratford HS North – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel – Chichester – Portsmouth and Southsea – Gosport – Hythe – Southampton
- 2tphH Hull Paragon – Brigg – Gainsborough Central – Lincoln – Sleaford – Peterborough – Ely (reverse) – Norwich
- 2tphH Cleethorpes – Grimsby Town – Market Rasen – Lincoln – Newark Northgate –:
Skegness – Wainfleet – Boston – Sleaford –:
Grantham (joins / splits) – Peterborough – March – Ely – Cambridge – Stansted Airport – Stratford HS North – Pancras Cross – Victoria (LL) – East Croydon – Gatwick Airport – Horsham – Arundel (splits / joins) – :
– Bognor
– Littlehampton
- 2tphH Edinburgh Waverley – Drem – Dunbar – Berwick-upon-Tweed – Alnmouth – Morpeth – Newcastle – Durham – Darlington –:
Newcastle – Sunderland – Seaham – Hartlepool – Stockton – Eaglescliffe – Yarm – Northallerton –:
York (joins / splits) – Doncaster – Peterborough – Ely – Cambridge – Stansted Airport – Stratford HS North – St. Pancras (East)
- 2tphH Leeds City – Wakefield Westgate – Doncaster – Retford – Newark Northgate – Grantham – Peterborough – Ely – Cambridge – Stansted Airport – Stratford HS North – Stratford HS North – St. Pancras (East)

Regional Metro:

- 2tphR Harwich Town – Harwich International – Ipswich – Bury St. Edmunds – Ely – March – Peterborough – Stamford – Oakham – Melton Mowbray – Leicester – Hinckley – Nuneaton – Coleshill Parkway – Birmingham New Street – University – Bromsgrove – Droitwich Spa – Worcester Shrub Hill
- 2tphR Morecambe – Lancaster – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Manchester Oxford Rd. – Manchester Piccadilly – Stockport – Chinley – Sheffield Midland (reverse) – Chesterfield – Alfreton and Mansfield Parkway – Langley Mill – Nottingham – Melton Mowbray – Oakham – Stamford – Peterborough – March – Ely (split/joins):
– (reverse) Thetford – Wymondham – Norwich
– Cambridge – Stansted Airport
- 2tphRS Peterborough – Whittlesea – March – Manea – Ely – Kennett – Bury St. Edmunds – Thurston – Elmswell – Stowmarket – Needham Market – Ipswich

HS7 North of Birmingham:

- 2tphH Newcastle – Consett – Durham (Relly Mill) – Darlington –:
  Middlesborough – Thornaby – Eaglescliffe – Yarm – Northallerton – :
  York HS (joins / splits) – Leeds HS – Huddersfield – Sheffield HS – Derby – Birmingham Interchange – Worcester Shrub Hill – Cheltenham Spa – Bristol Parkway – Bristol Temple Meads – Taunton – Exeter St. David's – Plymouth
- 2tphH Norwich – Ely (reverse) – Peterborough – Nottingham – Derby – Birmingham Interchange – Worcester Shrub Hill – Cheltenham Spa – Bristol Parkway – Newport – Cardiff Central – Cardiff (Rhoose) Airport – Bridgend – Port Talbot – Neath – Swansea
- 2tphH York HS – Leeds HS – Huddersfield – Sheffield HS – Derby – Birmingham HS.
- 2tphH Halifax – Bradford Central - Shipley – Leeds City –:
  Skipton – Keighley – Shipley – Leeds City –:
  (joins / Splits) – South Yorkshire HL – Sheffield Midland – Chesterfirld – Derby – Birmingham HS.
- 2tphH Cleethorpes – Grimsby Town – Market Rasen – Lincoln – Newark Castle – Nottingham – Derby – Birmingham HS.
- 2tphH Skegness – Wainfleet – Boston – Sleaford – Lincoln – Newark Castle – Nottingham – Derby – Birmingham HS.

The Southern Transpennine services, HS and RM, all connect at Sheffield HS / Midland. The HS services have cross-platform interchange and the RM services have longer stops to allow for platform change. But there are exceptions to be noted: the HS3 services from Hull and from Barnsley / South Yorkshire to Portsmouth and Southsea, and the HS7 service from Halifax / Skipton to Birmingham HS, all travel via Sheffield Midland, joining HS3 at Huthwaite Junction. The Representative Hourly Pattern is:

00H Preston – Norwich
H HS3 York – Pancras Cross [HS5 –> Brighton] (HS Metro)
R Southport – Hull

05H Liverpool – Hull via Gainsborough Central
H HS3 Barnsley / South Yorkshire LL – Pancras Cross [HS5 –> Portsmouth and Southsea] (UHS) *(Sheffield Midland)*

10H HS3 Preston – Pancras Cross [HS5 –> Tunbridge Wells] (UHS)
H HS7 Newcastle / Middlesborough – Plymouth
H HS7 Halifax / Skipton – Birmingham HS *(Sheffield Midland)*
R Blackpool – Cleethorpes

15H Liverpool – Skegness (formerly RM)
H HS3 Preston – Pancras Cross [HS5 –> Brighton] (HS Metro)

20H Preston – Cleethorpes via Gainsborough Central
H HS3 Hull – Pancras Cross [HS5 –> Portsmouth and Southsea] (UHS) *(Sheffield Midland)*
R Morecambe – Norwich / Stansted Airport

25H Liverpool – Pancras Cross {HS5 –> Tunbridge Wells] (UHS)
H HS7 York – Birmingham HS

– repeating at 30, 35, 40, 45, 50 and 55 minutes past.

Representative Hourly Cross-Platform Interchange Pattern at Nottingham:

00H Preston – Norwich
H HS3 York – Pancras Cross [HS5 –> Brighton] (HS Metro)

07H HS7 Newcastle / Middlesborough – Plymouth
H HS7 Birmingham – Cleethorpes

15H HS3 Preston – Pancras Cross [HS5 –> Brighton] (HS Metro)
R Morecambe – Norwich / Stansted Airport

23H HS7 Birmingham – Skegness
(no connection)

– repeating at 30, 37, 45 and 53 minutes past.

Service plan 3 imposes the following loadings on HS8:

- Liverpool Lime St. – Kenyon West Junction 13tph
- Kenyon West Junction – Kenyon South Junction 2tph
- Kenyon West Junction – Kenyon North Junction 1tph
- Kenyon West Junction – Broughton Junction 10tph
- Preston – Gibb Farm Junction 14tph
- Gibb Farm Junction – Kenyon North Junction 4tph
- Gibb Farm Junction – Broughton Junction 10tph
- Broughton Junction – Guide Bridge HS Junction 20tph
- Guide Bridge HS Junction – Ladybower Junction 12tph
- Paddock Junction – Ladybower Junction 6tph
- Ladybower Junction – Woodburn HS Junction 18tph
- Woodburn HS Junction – Waleswood Junction 18tph
- Waleswood Junction – Wales Junction 14tph
- Wales Junction – Huthwaite Junction 26tph
- Huthwaite Junction – Nuthall North Junction 32tph
- Nuthall North Junction – Nuthall South Junction 24tph
- Nuthall South Junction – Strelley Junction 6tph
- Strelley Junction – Nottingham HS station 18tph
- Nottingham HS station – Manvers St. Junction 18tph
- Manvers St. Junction – Edwalton Junction 18tph
- Edwalton Junction – Asfordby Junction 12tph
- Asfordby Junction – Wymondham East Junction 4tph
- Wymondham East Junction – Thurlby Junction 4tph
- Thurlby Junction – Pellett Hall Junction 8tph
- Pellett Hall Junction – Peterborough HS 12tph
- Peterborough HS – Ely 12tph

Northern Transpennine Services:

HS9:

- 2tphH Liverpool Lime Street – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – York HS (splits / joins) –:
  – Darlington – Durham (Relly Mill) – Consett – Newcastle
  – Northallerton – Yarm – Eaglescliffe – Thornaby – Middlesborough
- 2tphH Liverpool Lime Street – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – York – Thirsk – Northallerton – Yarm – Eaglescliffe – Stockton – Hartlepool – Seaham – Sunderland – Newcastle
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – Selby – Hull
- 2tphH Preston – Bolton – Manchester Victoria (LL) – Manchester HS – Huddersfield – Leeds HS – Micklefield – York – Malton – Seamer – Scarborough

Regional Metro:

(Note that **all** these services have the stopping pattern: Salford Central – Manchester Victoria – Stalybridge – Diggle – Marsden – Huddersfield – Mirfield – Dewsbury – Batley – Leeds City, which will not be repeated):

- 2tphR Chester – Helsby – Warrington Bank Quay – Newton le Willows – Salford Central —> Leeds City – Wetherby – Harrogate – Ripon – Northallerton – Yarm – Eaglescliffe – Stockton – Hartlepool – Seaham – Sunderland – Newcastle
- 2tphR Southport – Wigan Wallgate – Bolton – Salford Crescent – Salford Central —> Leeds City – Wetherby – Harrogate – Ripon – Northallerton – Yarm – Eaglescliffe – Thornaby – Middlesborough
- 2tphR Liverpool Lime St. – St. Helen's Junction – Newton le Willows – Salford Central —> Leeds City – Micklefield – York – Strensall – Malton – Rillington (NYMR) – Seamer – Scarborough
- 2tphR Blackpool North – Poulton le Fylde – Kirkham – Preston – Leyland – Chorley – Horwich Parkway – Bolton – Salford Crescent – Salford Central —> Leeds City –Micklefield – Selby – Brough – Hull

The extracts from other routes' service plans given previously for Southern Transpennine in most cases affect HS9 also. They are not repeated here.

The Northern Transpennine services, HS and RM, all connect at Huddersfield. The HS services have cross-platform interchange and the RM services have longer stops to allow for platform change. The Representative Hourly Pattern is:

00H Liverpool – Newcastle / Middlesborough
H Preston – Scarborough
R Blackpool – Hull

07H [HS5 Brighton –>] HS3 Pancras Cross – York (HS Metro)
H Liverpool – Newcastle (via Stockton)
R Southport – Middlesborough

15H HS7 Plymouth – Newcastle
H Preston – Hull
R Liverpool – Scarborough

23H HS7 Birmingham HS – York
R Chester – Newcastle (via Stockton)

Service plan 3 imposes the following loadings on HS9:

- Guide Bridge HS Junction – Paddock Junction 8tph
- Paddock Junction – Gelderd Rd. North Junction 14tph
- Gelderd Rd. North Junction – Garforth West Junction 16tph
- Garforth West Junction – Micklefield HS Junction 6tph
- Garforth West Junction – Garforth East Junction 10tph
- Garforth East Junction – York HS station 16tph
- York HS station – Poppleton Junction 18tph
- Poppleton Junction – Romanby Junction 24tph
- Romanby Junction – Derwent Hill Junction 10tph
- Derwent Hill Junction – Paradise Junction 8tph
- Paradise Junction – Newcastle station 12tph

Estimated Journey Times Mk2

Because of infrastructure changes, some line speeds and distances have changed from Mk1A:

- Nottingham HS – Peterborough (avoiding Melton) 83.8km (300kph)
- Nottingham HS – Edwalton Junction 6.8km (300kph *)
- Edwalton Junction – Peterborough 77km (300kph)
- Edwalton Junction – Asfordby Junction 19.6km (300kph)
- Asfordby Junction – Wymondham East Junction 12.1km (300kph)
- Wymondham East Junction – Thurlby Junction 27km (300kph)
- Thurlby Junction – Pellett Hall Junction 12km (300kph)
- Pellett Hall Junction – Peterborouygh HS 6.3km (300kph)
- Peterborough – Ely via Wimblington 46km (300kph)

(*) With this line speed, Edwalton becomes a propinquant junction, and the time to travel from Nottingham HS to Edwalton Junction (6.8km start to pass) is 213 seconds.

For other routes, first served at Mk2:

- Waleswood Junction – Worksop 14.95km (200kph)
- Sheffield HS – Worksop 25.5km (230/200kph)
- Worksop – Retford LL 12.3km (200kph)
- Retford LL – Gainsborough Central 16.1km (200kph)
- Gainsborough Central – Brigg 16.7km (300kph)
- Brigg – Hull Paragon 25km (300kph)
- Brigg – Grimsby Town 29.3km (200kph)
- Grimsby Town – Cleethorpes 5.6km (160kph)
- Retford LL – Gainsborough Lea Road 15.2km (200kph)
- Gainsborough Lea Road – Lincoln 25.1km (200kph)
- Lincoln – Sleaford 35.2km (200kph)
- Sleaford – Boston 27.1km (200kph)
- Boston – Wainfleet 30.3km (200kph)
- Wainfleet – Skegness 8.0km (200kph *)

Note that the section between Sheffield HS and Waleswood Junction has a line speed of 230kph, as does the section thence to Wales Junction on HS3, but the section following Waleswood Junction on to Worksop has a line speed of only 200kph. Services passing on to HS3 at Wales Junction may thus accelerate from Sheffield up to 230kph, and hold that speed until they are (wholly) on HS3, but services travelling on to Worksop must decelerate to 200kph at Waleswood Junction.

(*) The time Shefield HS – Woodburn Junction is calculated from $t = \sqrt{(2s/a)}$. Wainfleet and Skegness are adjacent stations, and the time to travel between them (8.0km, start to stop) is 292sec.

Since there are no changes to HS9, the journey times between Liverpool and Newcastle / Middlesborough, also Newcastle via Hartlepool, and Preston – Hull / Scarborough, are unchanged from Mk1A. There are thus no changes on the Northern Transpennine route.

3. Southern Transpennine: Preston – Norwich (7 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - Gibb Farm Junction	24.0	24.0	7.0	7.0	
Gibb Farm Junction - Bolton	8.0	32.0	3.1	10.1	10.1
Bolton - Victoria LL	17.0	49.0	7.1	17.2	20.2
Victoria LL - Manchester HS	0.5	49.5	1.2	18.4	24.4
Manchester HS - Sheffield HS	54.0	103.5	14.5	32.9	41.9
Sheffield HS - Wales Junction	11.3	114.8	4.7	37.6	
Wales Juntion - Nuthall South Junction	43.0	157.8	7.8	45.4	
Nuthall South Junction - Nottingham	7.4	165.2	2.9	48.4	60.4
Nottingham - Edwalton Junction	6.8	172.0	3.6	51.9	
Edwalton Junction - Peterborough	77.0	249.0	16.9	68.8	83.8
Peterborough - Ely (reverse)	46.0	295.0	12.9	81.7	99.7
Ely - Brandon Junction	18.0	313.0	6.5	88.3	
Brandon Junction - Roudham Heath Junction	24.0	337.0	5.1	93.4	
Roudham Heath Junction - Norwich	40.0	377.0	12.9	106.3	129.3

Current fastest time (minutes) from Preston [plus Mk2 times] to:

- Bolton 26 [10]
- Manchester (Vic) 49 [20]
- Manchester (Pic/HS) 41 [24]
- Sheffield 107 (1 change) [42]
- Nottingham 160 (1 change) [60]
- Peterborough 201 (3 changes) [84]
- Ely 266 (2 changes) [100]
- Norwich 290 (1 changes) [129]

3P. Southern Transpennine: Preston – Norwich (7 stops; with passing times):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - *Gibb Farm Junction (pass)*	24.0	24.0	7.0	*7.0*	*7.0*
Gibb Farm Junction (pass) - Bolton	8.0	32.0	3.1	10.1	10.1
Bolton - Victoria LL	17.0	49.0	7.1	17.2	20.2
Victoria LL - Manchester HS	0.5	49.5	1.2	18.4	24.4
Manchester HS - *Guide Bridge HS Jn. (pass)*	8.0	57.5	3.9	*22.3*	*31.3*
Guide Bridge HS Jn. (pass) - Ladybower Jn. (pass)	29.0	86.5	5.8	*28.1*	*37.1*
Ladybower Junction (pass) - Sheffield HS	17.0	103.5	4.8	32.9	41.9
Sheffield HS - *Woodburn Hs Junction (pass)*	1.6	105.1	1.7	*34.6*	*46.6*
Woodburn HS Jn. (pass) - Waleswood Jn. (pass)	9.0	114.1	2.8	*37.4*	*49.4*
Waleswood Jn. (pass) - Wales Junction (pass)	0.7	114.8	0.2	*37.6*	*49.6*
Wales Junction (pass) - Huthwaite Junction (pass)	25.0	139.8	4.6	*42.2*	*54.2*
Huthwaite Jn. (pass) - Nuthall North Jn. (pass)	13.5	153.3	2.3	*44.4*	*56.4*
Nuthall North Jn. (pass) - Nuthall South Jn. (pass)	4.5	157.8	1.0	*45.5*	*57.5*
Nuthall South Jn. (pass) - Strelley Junction (pass)	0.4	158.2	0.1	*45.6*	*57.6*
Strelley Junction (pass) - Nottingham	7.0	165.2	2.8	48.4	60.4
Nottingham - *Edwalton Junction (pass)*	6.8	172.0	3.6	*51.9*	*66.9*
Edwalton Junction (pass) - Asfordby Junction (pass)	19.6	191.6	4.0	*56.0*	*71.0*
Asfordby Junction (pass) - Wymondham East Jn. (pass)	12.1	203.7	2.4	*58.4*	*73.4*
Wymondham East Jn. (pass - Thurlby Junction (pass)	27.0	230.7	5.4	*63.8*	*78.8*

Thurlby Junction (pass) - Pellett Hall Junction (pass)	12.0	242.7	2.4	*66.2*	*81.2*
Pellett Hall Junction (pass) - Peterborough	6.3	249.0	2.6	68.9	83.9
Peterborough - Ely (reverse)	46.0	295.0	12.9	81.8	99.8
Ely - *Brandon Junction (pass)*	18.0	313.0	6.5	*88.3*	*111.3*
Brandon Junction (pass) - Roudham Heath Jn. (pass)	24.0	337.0	5.1	*93.4*	*116.4*
Roudham Heath Junction (pass) - Norwich	40.0	377.0	12.9	106.3	129.3

4. Southern Transpennine: Preston – Cleethorpes (9 stops)

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - Gibb Farm Junction	24.0	24.0	7.0	7.0	
Gibb Farm Junction - Bolton	8.0	32.0	3.1	10.1	10.1
Bolton - Victoria LL	17.0	49.0	7.1	17.2	20.2
Victoria LL - Manchester HS	0.5	49.5	1.2	18.4	24.4
Manchester HS - Sheffield HS	54.0	103.5	14.5	32.9	41.9
Sheffield HS - Waleswood Junction	10.6	114.1	4.5	37.4	
Waleswood Junction - Worksop	15.0	129.0	5.4	42.8	54.8
Worksop - Retford LL	12.3	141.3	6.2	49.0	64.0
Retford LL- Gainsborough Central	16.1	157.4	7.3	56.3	74.3
Gainsborough Central - Brigg	16.7	174.1	7.0	63.3	84.3
Brigg - Grimsby Town	29.3		11.3	74.6	98.6
Grimsby Town - Cleethorpes	5.6	179.7	4.1	78.7	105.7

Current fastest time (minutes) from Preston [plus Mk2 times] to:

- Bolton 26 [10]
- Manchester (Vic) 57 [20]
- Manchester (Pic/HS) 41 [24]
- Sheffield 107 (1 change) [42]
- Worksop 147 (2 changes) [55]
- Retford LL 182 (2 changes) [64]
- Gainsborough Central 232 (3 changes) [74] Current is Lea Road then walk!
- Brigg [84] No current!
- Grimsby Town 210 (1 change) [99]
- Cleethorpes 226 (1` change) [106]

4P. Southern Transpennine: Preston – Cleethorpes (9 stops; with passing times)

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - *Gibb Farm Junction (pass)*	24.0	24.0	7.0	*7.0*	*7.0*
Gibb Farm Junction (pass) - Bolton	8.0	32.0	3.1	10.1	10.1
Bolton - Victoria LL	17.0	49.0	7.1	17.2	20.2
Victoria LL - Manchester HS	0.5	49.5	1.2	18.4	24.4
Manchester HS - *Guide Bridge HS Junction (pass)*	8.0	57.5	3.8	*22.2*	*31.2*
Guide Bridge HS Jn. (pass) - Ladybower Jn.	29.0	86.5	5.9	*28.1*	*37.1*
Ladybower Junction (pass) - Sheffield HS	17.0	103.5	4.8	32.9	41.9
Sheffield HS - *Woodburn HS Junction (pass)*	1.6	105.1	1.7	*34.6*	*46.6*
Woodburn HS Jn. (pass) - Waleswoos Jn. (pass)	9.0	114.1	2.9	*37.4*	*49.4*
Waleswood Junction (pass) - Worksop	15.0	129.0	5.4	42.8	54.8
Worksop - Retford LL	12.3	141.3	6.2	49.0	64.0
Retford LL- Gainsborough Central	16.1	157.4	7.3	56.3	74.3
Gainsborough Central - Brigg	16.7	174.1	7.0	63.3	84.3
Brigg - Grimsby Town	29.3	203.4	11.3	74.6	98.6
Grimsby Town - Cleethorpes	5.6	209.0	4.1	78.7	105.7

5. Southern Transpennine: Liverpool – Hull / Skegness (7/10 stops)

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	49.0	49.0	12.6	12.6	12.6
Victoria LL - Manchester HS	0.5	49.5	1.2	13.8	16.8
Manchester HS - Sheffield HS	54.0	103.5	14.5	28.3	34.3
Sheffield HS - Waleswood Junction	10.6	114.1	4.5	32.9	
Waleswood Junction - Worksop	15.0	129.0	5.4	38.3	47.3
Worksop - Retford LL	12.3	141.3	6.2	44.4	56.4
Retford LL- Gainsborough Central	16.1	157.4	7.3	51.7	66.7
Gainsborough Central - Brigg	16.7	174.1	7.5	59.2	77.2
Brigg - Hull Paragon	25.0	199.1	10.0	69.2	90.2
Retford LL - Gainsborough Lea Road	15.2	156.5	7.0	51.5	66.5
Gainsborough Lea Road - Lincoln	25.1	181.6	10.0	61.5	79.5
Lincoln - Sleaford	35.2	216.8	13.0	74.5	95.5
Sleaford - Boston	27.1	243.9	10.6	85.1	109.1
Boston - Wainfleet	30.3	274.2	11.6	96.7	123.7
Wainfleet - Skegness	8.0	282.2	4.9	101.5	131.5

Current fastest time (minutes) from Liverpool [plus Mk2 times] to:

- Manchester (Vic.) 32 [13]
- Manchester (Pic/HS) 45 [17]
- Sheffield 102 [34]
- Worksop 142 (1 chamge) [47]
- Retford LL 153 (1 change) [56]
- Gainsborough Central 199 (2 changes) [66] Current time to Lea Road, then walk!
- Brigg [77] No current time!
- Hull 185 (1 change) [90]
- Gainsborough Lea Ro ad 168 (1 change) [67]
- Lincoln 192 (1 change) [80]
- Sleaford 232 (2 changes) [96]

- Boston 264 (1 change) [109]
- Wainfleet 289 (1 change) [124]
- Skegness 306 (1 change) [132]

5P. Southern Transpennine: Liverpool – Hull / Skegness (7/10 stops; with passing times)

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. - *Kenyon West Jn. (pass)*	29.0	29.0	7.6	*7.6*	*7.6*
Kenyon West Jn. (pass) - Victoria LL	20.0	49.0	5.0	12.6	12.6
Victoria LL - Manchester HS	0.5	49.5	1.2	13.8	16.8
Manchester HS - *Guide Bridge HS Junction (pass)*	8.0	57.5	3.8	*17.7*	*23.7*
Guide Bridge HS Jn. (pass) - Ladybower Jn.	29.0	86.5	5.9	*23.5*	*29.5*
Ladybower Junction (pass) - Sheffield HS	17.0	103.5	4.8	28.3	34.3
Sheffield HS - *Woodburn HS Junction (pass)*	1.6	105.1	1.7	*30.0*	*39.0*
Woodburn HS Jn. (pass) - Waleswoos Jn. (pass)	9.0	114.1	2.9	*32.9*	*41.9*
Waleswood Junction (pass) - Worksop	15.0	129.0	5.4	38.3	47.3
Worksop - Retford LL	12.3	141.3	6.2	44.4	56.4
Retford LL- Gainsborough Central	16.1	157.4	7.3	51.7	66.7
Gainsborough Central - Brigg	16.7	174.1	7.0	58.8	76.8
Brigg - Hull Paragon	25.0	199.1	10.0	68.8	89.8
Retford LL - Gainsborough Lea Road	15.2	156.5	7.0	51.5	66.5
Gainsborough Lea Road - Lincoln	25.1	181.6	10.0	61.5	79.5
Lincoln - Sleaford	35.2	216.8	13.0	74.5	95.5
Sleaford - Boston	27.1	243.9	10.6	85.1	109.1
Boston - Wainfleet	30.3	274.2	11.6	96.7	123.7
Wainfleet - Skegness	8.0	282.2	4.9	101.5	131.5

Appendix A – Route Changes at Mk1A and Mk2

The following fundamental changes of plan at Mk1A are shared with HS3 and HS7:

1. HS2 Ltd.'s plans for a considerably improved alignment in South Yorkshire have been adopted, with refinements as necessary, in particular the new connection to the classic route into Leeds City, from the east (diverging from HS3 at the new Swillington Common Junction).
2. Abandoning GC gauge, so that all new infrastructure is built to standard UK gauge. As a consequence of this, certain appropriate sections of classic route are merged into HS routes, with upgrading as necessary for higher speeds (140, 125 or 100mph).

The individual changes are:

- New link Huthwaite Junction – Stonebroom Junction on the Erewash Valley route.
- Incorporation of classic route into HS3, upgraded as practicable to 100mph line speed, from Stonebroom Junction via Chesterfield, Sheffield Midland and Rotherham to South Yorkshire LL station. South Yorkshire is a 2-level station, the HL on HS3's main line and the LL on the classic Sheffield – Doncaster route. The LL station has a bay platform on the north side, where the South Yorkshire portion of the service from Pancras Cross terminates; the other portion terminates in Barnsley. There is a connection from Old Denaby Junction, on the classic route, to Denaby Main Junction, on HS3, immediately south of South Yorkshire HL station. This allows the HS7 service from Birmingham HS to Leeds and Halifax/Skipton (see below) to travel via Sheffield and re-join HS3 at South Yorkshire.
- A new link from Ryhill Junction on HS3 to Crofton Junction on the classic route from Doncaster to Leeds, allows the HS Pancras Cross – York via Leeds service to call at Wakefield Westgate. It then follows the classic route, upgraded to line speed 100mph, to Gelderd Road South Junction, where it diverges to join HS9 at Gelderd Road North Junction, then serving Leeds New Lane station.
- A new connection diverges from HS3 at Swillington Common Junction, and joins the classic route to Leeds City at Manston Junction. Services from Pancras Cross and Birmingham take this route, splitting / joining at Leeds City into / from Halifax and Skipton portions. The Halifax portion travels via Shipley (they both do, but using different platforms there,) and the new cross-city link at Bradford, serving the new, central, Bradford Central station.
- HS3 merges with the fast tracks of the ECML at Poppleton Junction (immediately after the ECML become 4-track just north of York), and shares that (upgraded to 140mph line speed) until Romanby Junction, where it diverges and assumes its former alignment on to Darlington and points north.
- All the HS Newcastle services (from London, Plymouth, Liverpool and Bournemouth West) now include a Middlesborough portion, splitting / joining at York.
- The section of classic route between Northallerton and Yarm is likewise upgraded to line speed 140mph. Beyond Yarm, the line speed is irrelevant since Yarm and the remaining three stations are too close together to allow any reasonable line speed to be reached.

Not all of the above changes directly affect HS8/HS9, but this subnetwork is so intimately linked that no purpose is served by isolating those sections actually used by transpennine services.

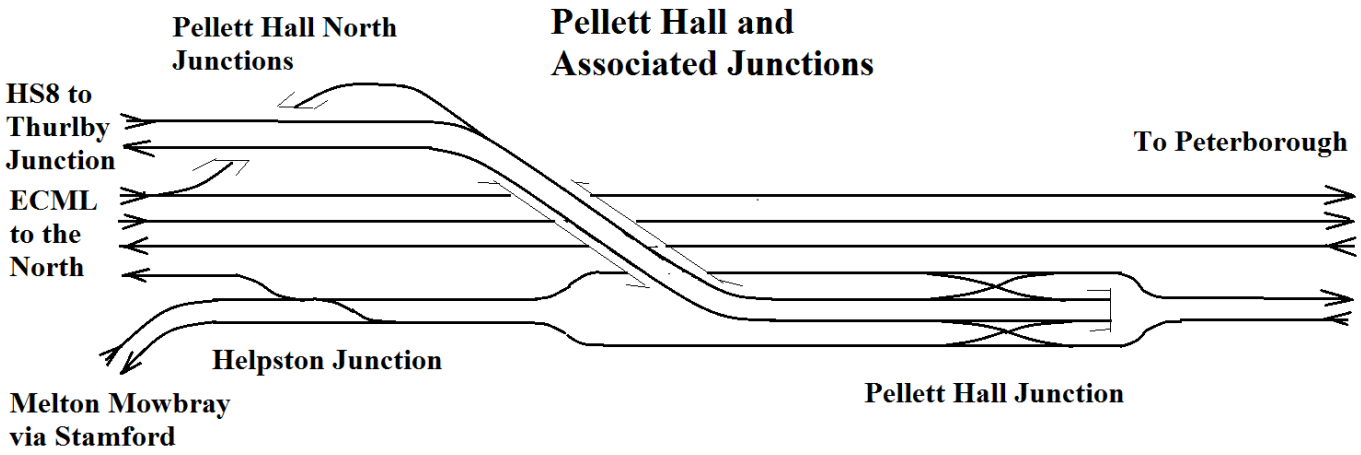
The other changes specifically affecting HS8 only, at Mk1A, (there are none affecting HS9,) all concern the section between Nottingham and Ely (continuing via HS6 to Norwich). These are:

- HS8 merges with the restored Midland route between Edwalton Junction and the former Wymondham Junction, via Melton Mowbray. Wymondham Junction is renamed Wymondham West Junction, (see Mk2 below,) and is where the former Saxby – Bourne branch (whose route is taken over by HS8) diverged.
- Between Edwalton and Melton Junctions, the line speed is 140mph. Between Melton and Wymondham West junctions, it is 100mph.
- The section between Wymondham West and Pellett Hall junctions is new infrastructure, exactly as in the original Mk1 plan.
- At Pellett Hall Junction, HS8 crosses the ECML tracks by flyover, and joins and merges with the Midland tracks, following these into the existing Peterborough station. This is a significant change from the original plan. These tracks are upgraded for a line speed of 140mph as necessary, given that all trains will be stopping at Peterborough.
- HS8 continues to Ely over the classic route, via March.

Some of the Mk1A changes above, specifically the classic section between Edwalton and Asfordby junctions, and the recasting of Pellett Hall Junction, are retained at Mk2. Further changes at Mk2 are:

- The fundamental change at Mk2 is that there are 4 tracks between Broughton and Guide Bridge HS junctions.
- On the Nottingham – Ely section, the original new infrastructure between Asfordby and Wymondham East junctions is restored, thus passing round the south of Melton Mowbray. (Wymondham East Junction is a little to the east of Wymondham West, and is where, in the original plan, HS8 joined the route of the Saxby – Bourne line.) A new Link between the Syston – Melton Mowbray line and the new infrastructure, avoiding Melton Mowbray, at Melton HS Junction allows express freight traffic to join HS8.
- It is unusually practical to use this section of HS8 for freight also, certainly at night, but even during the day. The usual objection, that HS lines involve gradients too severe for freight, simply does not apply here, where the gradients are modest, most of the area being pretty much flat. Also, and at least as important, the HS traffic is light, especially over the central portion between Asfordby and Thurlby junctions, where it is only 4tph. Furthermore, between the proposed Melton HS Junction and Ely, it duplicates one of the key freight routes, between the West Midlands and Felixstowe, which really would welcome any extra capacity.
- New infrastructure is provided between Pellett Hall Junction and the new Peterborough HS platforms, as in the original plan, including the tunnel approach to Peterborough from Werrington. But the new infrastructure is now wholly on the west side of the ECML, not, as formerly, on the east side to Werrington, and crossing there.
- New infrastructure is provided between Peterborough and Ely, following the original plan for a new alignment between Whittlesey and Manea, via Wimblington.
- The section between Pellett Hall Junction and Melton HS Junction is shared between HS8 and express freight, as proposed above. The section between Asfordby and Edwalton junctions is likewise shared between HS8 and RM services on the restored Melton – Nottingham route.

Appendix B – Pellett Hall Junction



The above layout applies at both Mk1A and Mk2, the only difference being that the tunnel section of HS8 into Peterborough HS is new at Mk2. At Mk1A, HS8's services travel into Peterborough via the Midland tracks.

The northbound Midland track also serves as the relief northbound track for the ECML. It joins the ECML alignment at Helpston Junction, where the Midland route to Melton Mowbray diverges. All of this is as it exists already.

The above arrangement allows for the following HS6 services:

- Bognor / Littlehampton – Cleethorpes / Skegness
- St. Pancras East – York – Edinburgh via ECML / Newcastle via Hartlepool
- St. Pancras East – Leeds City

to join the ECML, having travelled on HS8 between Ely and Pellett Hall. It also allows for express freights from Felixstowe, which have travelled from Ely on the classic route via March and then on the Midland track to Pellett Hall to join HS8.

And vice versa.

Appendix C – Trans-Pennine Distance Table

Distance Table for HS8/HS9		
Peterborough to:	miles:chains	km
March	14:74	24.0
Manea	20:52	33.2
Ely	30:40	49.1
Micklefield to:	miles:chains	km
Church Fenton	5:10	8.2
Holgate Junction	15:35	24.8
York ECML	15:68	25.5
Selby	11:25	18.2
Gliberdyke	25:28	40.8
Hull Paragoe	42:24	68.1
York ECML to:	miles:chains	km
Thirsk	22:16	35.7
Northallerton	29:76	48.2
Yarm	42:01	67.6
Eaglescliffe	44:46	71.7
Thornaby	47:46	76.5
Middlesborough	50:63	81.7
Stockton	47:50	76.6
Hartlepool	59:21	95.4
Seaham	72:15	116.1
Sunderland	77:26	124.4
Newcastle	89:39	144.0
Barton Hill	11:48	18.7
Malton	21:12	34.0
Rillington Junction	25:42	41.1
Seamer	39:14	63.0
Scarborough	42:06	67.7
Sheffield Midland to:	miles:chains	km
Worksop	15:66	25.5
Retford LL	23:37	37.8
Gainsborough Central	33:41	53.9
Brigg	50:06	80.6
Grimsby Town	68:25	109.9
Cleethorpes	71:64	115.5
Gainsborough Lea Road	32:74	53.0
Lincoln	48:44	78.1
Sleaford	70:34	113.3
Boston	87:21	140.4
Wainfleet	106:08	170.7
Skegness	111:07	178.7

Sheffield HS to:	OS Map Ref:	km
Woodburn HS Junction	SK370878	1.55
Waleswood Junction	SK469839	10.55
Wales Junction	SK474835	11.29
Nottingham to:	OS Map Ref.	km
Manvers St. Junction	SK588393	1.3
Edwalton Junction	SK601347	6.8
Plumtree station (site of)	SK618324	9.8
Plumtree station to:	miles	km
Asfordby Junction	9.8	16.6
Melton Mowbray	12.6	20.3
Liverpool Lime St. to:	miles:chains	km
Edge Hill	1:31	2.2
Newton-le-Willows	15:60	25.3
Kenyon West Junction	18:00	29.0

The source of these data is 'Track Atlas of Mainland Britain' (TRACKmaps 2009). The values are given in miles and chains (80 chains = 1 mile). The distances between Nottingham and Melton Mowbray were (for the first three locations, specified by OS Map reference, were measured with dividers on a 1:25000 map, and the remaining two on a 1" to the mile map. The distance between Newton-le-Willows station and Kenyon West Junction was measured with dividers on a 1:25000 map, and is exactly 2.25mile = 2:20. The various distances from Sheffield and Nottingham for which map references are quoted are also measured by dividers, this time on 7th series 1"/1mile maps. They are accurate at least to 1 place of decimals (pretty accurate even to 2 places!). The distance between Waleswood and Wales junctions is 0.67km direct – crow flight – inflated by 11% to give the equivalent quarter-circle arc length of 0.74km (specifically, multiplied by $\pi/2\sqrt{2}$). (Both mile and km scales are given on all OS maps, as one would expect from such a quality product.)

This exercise provided less difficulty than most such, but was nonetheless a sufficiently tedious process to make it worth preserving the results, so that I don't ever have to do it again.

Appendix Q – Journey Times for Line Speed 225kph, 140mph

The article ‘Line Capacity vs. Speed for High Speed Railways’ points out (in the section ‘Consequences of the Results’) that a good case can be made for a line speed of 225kph, 140mph, because this offers a good compromise between speed and line capacity (theoretical capacity 49tph at 225kph with basic Train Separation Distance as compared with 29tph at 360kph with extended TSD). Even more important is the fact that this is just within the current (as at 2014) Turnout Limit Speed of 230kph, 144mph. This is the maximum speed at which trains can diverge from the main line of a HS railway, using the fastest available pointwork. What this means is that diverging trains can leave the main line at full line speed; there is no need to decelerate on the main line before diverging. This means that the Extended Train Separation Distance standard, which allows diverging trains to decelerate on the main line, without affecting a following straight-ahead train, which continues at full line speed, is no longer necessary, which allows major simplification in the operation of HS railways. (Note that these preceding remarks apply only to routes where **overtaking** takes place – specifically to HS2, HS3, HS4 and HS14. They do not apply to routes with an HS-Metro service pattern. But the journey times for line speed 225kph is of interest for all routes.)

This new appendix Q is being added to every Route and Service Plans article, to show what the effect would be for the journey times of the various services. No recommendation is actually being made for this change, but it is important that the supporting information be available to allow a reasoned decision to be made.

1. Northern Transpennine: Liverpool Lime St. – Newcastle / Middlesborough / Newcastle via Hartlepool (8/9/14 stops):

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	49.0	49.0	15.8	15.8	15.8
Victoria LL - Manchester HS	0.5	49.5	1.2	17.1	20.1
Manchester HS - Huddersfield	39.0	88.5	13.2	30.2	36.2
Huddersfield - Leeds HS	24.0	112.5	9.2	39.4	48.4
Leeds HS - York HS	39.8	152.3	13.4	52.8	64.8
York HS - Darlington Bank Top	70.0	222.3	21.4	74.3	89.3
Darlington Bank Top - Durham Relly Mill	33.0	255.3	11.6	85.8	103.8
Durham Relly Mill - Consett	20.0	275.3	8.1	93.9	114.9
Consett - Newcastle	20.0	295.3	8.1	102.1	126.1
York HS - Northallerton	48.2	200.5	15.6	68.4	88.4
Northallerton - Yarm	19.5	220.0	8.0	76.4	99.4
Yarm - Eaglescliffe	4.1	224.1	3.5	79.9	105.9
Eaglescliffe - Thornaby	4.9	229.0	3.8	83.7	112.7
Thornaby - Middlesborough	5.2	234.2	3.9	87.6	119.6
Leeds HS - Micklefield.	16.0	128.5	7.0	46.5	129.6
Micklefield - York (ECML)	25.5	154.0	9.6	56.0	142.2
York (ECML) - Thirsk	35.7	189.7	12.3	68.3	157.5
Thirsk - Northallerton	12.5	202.2	6.1	74.4	166.6
Northallerton - Yarm	19.4	221.6	8.0	82.4	177.6
Yarm - Eaglescliffe	4.1	225.7	3.5	85.9	184.1
Eaglescliffe - Stockton	4.9	230.6	3.8	89.7	190.9
Stockton - Hartlepool	18.8	249.4	9.0	98.7	202.9
Hartlepool - Seaham	20.7	270.1	9.7	108.5	215.6
Seaham - Sunderland	8.3	278.4	5.1	113.5	223.7
Sunderland - Newcastle	19.6	298.0	9.3	122.9	236.0

Current fastest time (minutes) from Liverpool [and the Mk2 times] {and the above values} to:

- Manchester (Vic.) 32 [13] {16}
- Manchester (Pic/HS) 45 [17] {20}
- Huddersfield 68 [31] {36}
- Leeds 88 [43] {48}
- Micklefield 118 (1 change) [53] {59}
- York 114 [58/66] {65}
- Darlington 148 [86] {89}
- Durham 165 [99] {104}
- Consett [110] {115}
- Newcastle 180 [120/159] {126/165} (HS9 / via Hartlepool)
- Thirsk 139 (1 change) [81] {95}
- Northallerton 136 [82/90] {88/95} (non-stop/ / stop Thirsk)
- Yarm 162 (1 change) [93/101] {99/106}
- Eaglescliffe 172 (1 change) [100/107] {106/113}
- Thornaby 170 (1 change) [106] {113}
- Middlesborough 180 (1 change) [113] {120}
- Stockton 188 (2 changes) [114] {120}
- Hartlepool 192 (1 change) [126] {132}
- Seaham 225 (1 change) [139] {145}
- Sunderland 217 (1 change) [147] {153}

2. Northern Transpennine: Preston – Hull / Scarborough (8/10 stops):

Current fastest time (minutes) from Preston [and the Mk2 times] {and the above values]}to:

- Bolton 26 [10]
- Manchester (Vic.) 49 [20]
- Manchester (Pic/HS) 41 [24]
- Huddersfield 75 (1 change) [39]
- Leeds 74 [51]
- Micklefield 124 [60]
- Selby 130 (1 change) [71]
- Gilberdyke 161 (2 changes) [84]
- Hull Paragon 168 (1 change) [97]
- York 139 (2 changes) [73]
- Malton 157 (1 change) [88]
- Seamer 174 (1 change) [108]
- Scarborough 182 (1 change) [115]

2. Northern Transpennine: Preston – Hull / Scarborough (8/10 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Liverpool, inc. Station Wait Times
Preston -Bolton	32.0	32.0	11.3	11.3	11.3
Bolton - Victoria LL	17.0	49.0	7.3	18.6	21.6
Victoria LL - Manchester HS	0.5	49.5	1.2	19.8	25.8
Manchester HS - Huddersfield	39.0	88.5	13.2	33.0	42.0
Huddersfield - Leeds HS	24.0	112.5	9.2	42.2	54.2
Leeds HS - Micklefield	22.0	134.5	8.6	50.8	
Micklefield - Selby	18.2	152.7	7.9	58.8	73.8
Selby - Gilberdyke	22.6	175.3	9.2	68.0	86.0
Gilberdyke - Hull Paragon	27.3	202.6	10.7	78.7	99.7
Micklefield - York (ECML)	25.5	160.0	9.6	60.4	83.3
York (ECML) - Barton Hill	18.7	178.7	7.4	67.8	
Barton Hill - Malton	15.3	194.0	4.7	72.5	98.5
Malton - Rillington Junction	7.1	201.1	4.6	77.1	106.0
Rillington Junction - Seamer	21.9	223.0	9.0	86.1	118.1
Seamer - Scarborough	4.7	227.7	3.7	89.9	124.8

Current fastest time (minutes) from Preston [and the Mk2 times] {and the above values} to:

- Bolton 26 [10] {11}
- Manchester (Vic.) 49 [20] {22}
- Manchester (Pic/HS) 41 [24] {26}
- Huddersfield 75 (1 change) [39] {42}
- Leeds 74 [51] {54}
- Micklefield 124 [60] {66}
- Selby 130 (1 change) [71] {77}
- Gilberdyke 161 (2 changes) [84] {89}
- Hull Paragon 168 (1 change) [97] {103}
- York 139 (2 changes) [73] {86}
- Malton 157 (1 change) [88] {102}
- Seamer 174 (1 change) [108] {114}
- Scarborough 182 (1 change) [115] {120}

3. Southern Transpennine: Preston – Norwich (9 stops):

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - Bolton	32.0	32.0	11.3	11.3	11.3
Bolton - Victoria LL	17.0	49.0	7.3	18.6	21.6
Victoria LL - Manchester HS	0.5	49.5	1.2	19.8	25.8
Manchester HS - Sheffield HS	54.0	103.5	17.2	37.0	46.0
Sheffield HS - Nottingham	61.7	165.2	19.2	56.2	65.9
Nottingham - Edwalton Junction	6.8	172.0	3.6	59.8	
Edwalton Junction - Peterborough	77.0	249.0	21.6	81.4	94.0
Peterborough - Ely (reverse)	46.0	295.0	15.0	96.4	112.0
Ely - Brandon Junction	18.0	313.0	8.3	104.7	
Brandon Junction - Roudham Heath Junction	24.0	337.0	6.6	111.3	
Roudham Heath Junction - Norwich	40.0	377.0	12.9	124.2	144.9

Current fastest time (minutes) from Preston [and the Mk2 times] {and the above values} to:

- Bolton 26 [10] {11}
- Manchester (Vic) 49 [20] {22}
- Manchester (Pic/HS) 41 [24] {26}
- Sheffield 107 (1 change) [42] {46}
- Nottingham 160 (1 change) [60] {66}
- Peterborough 201 (3 changes) [84] {94}
- Ely 266 (2 changes) [100] {112}
- Norwich 290 (2 changes) [129] {145}

4. Southern Transpennine: Preston – Cleethorpes (9 stops)

Section	Distance (km)	Cumulative Distance (km)	Start - Stop Time (minutes)	Cumulative Journey Time (minutes)	Elapsed Time from Preston, inc. Station Wait Times
Preston - Bolton	32.0	32.0	11.3	11.3	11.3
Bolton - Victoria LL	17.0	49.0	7.1	18.4	21.4
Victoria LL - Manchester HS	0.5	49.5	1.2	19.6	25.6
Manchester HS - Sheffield HS	54.0	103.5	14.5	34.1	43.1
Sheffield HS - Waleswood Junction	10.6	114.1	4.6	38.7	
Waleswood Junction - Worksop	15.0	129.0	5.4	44.1	56.1
Worksop - Retford LL	12.3	141.3	6.2	50.3	65.3
Retford LL- Gainsborough Central	16.1	157.4	7.3	57.6	75.6
Gainsborough Central - Brigg	16.7	174.1	7.2	64.8	85.8
Brigg - Grimsby Town	29.3	203.4	11.3	76.1	100.1
Grimsby Town - Cleethorpes	5.6	209.0	4.1	80.1	107.1

Current fastest time (minutes) from Preston [and the Mk2 times] {and the above times} to:

- Bolton 26 [10] {11}
- Manchester (Vic) 57 [21] {22}
- Manchester (Pic/HS) 41 [24] {26}
- Sheffield 107 (1 change) [42] {46}
- Worksop 147 (2 changes) [55] {59}
- Retford LL 182 (2 changes) [64] {68}
- Gainsborough Central 232 (3 changes) [74] {79}
- Brigg (Lea Rd.) [84] {89}
- Grimsby Town 210 (1 change) [99] {103}
- Cleethorpes 226 (1` change) [106] {110}

5. Southern Transpennine: Liverpool – Hull / Skegness (7/10 stops)

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	49.0	49.0	15.8	15.8	15.8
Victoria LL - Manchester HS	0.5	49.5	1.2	17.1	20.1
Manchester HS - Sheffield HS	54.0	103.5	17.2	34.2	40.2
Sheffield HS - Waleswood Junction	10.6	114.1	4.6	38.8	
Waleswood Junction - Worksop	15.0	129.0	5.4	44.2	53.2
Worksop - Retford LL	12.3	141.3	6.2	50.4	62.4
Retford LL- Gainsborough Central	16.1	157.4	7.3	57.7	72.7
Gainsborough Central - Brigg	16.7	174.1	7.2	64.9	82.9
Brigg - Hull Paragon	25.0	199.1	9.4	74.3	95.3
Retford LL - Gainsborough Lea Road	15.2	156.5	7.0	57.4	72.4
Gainsborough Lea Road - Lincoln	25.1	181.6	10.0	67.4	85.4
Lincoln - Sleaford	35.2	216.8	13.0	80.4	101.4
Sleaford - Boston	27.1	243.9	10.6	91.0	115.0
Boston - Wainfleet	30.3	274.2	11.6	102.6	129.6
Wainfleet - Skegness	8.0	282.2	4.9	107.5	137.5

Current fastest time (minutes) from Liverpool [and the Mk2 times] {and the above times} to:

- Manchester (Vic.) 32 [13] {16}
- Manchester (Pic/HS) 45 [17] {20}
- Sheffield 102 [34] {40}
- Worksop 142 (1 chamge) [47] {53}
- Retford LL 153 (1 change) [56] {62}
- Gainsborough Central 199 (2 changes) [66] {73}
- Brigg (Lea Rd.) [77] {83}
- Hull 185 (1 change) [90] {95}
- Gainsborough Lea Ro ad 168 (1 change) [67] {72}
- Lincoln 192 (1 change) [80] {85}
- Sleaford 232 (2 changes) [96] {101}
- Boston 264 (1 change) [109] {115}
- Wainfleet 289 (1 change) [124] {130}
- Skegness 306 (1 change) [132] {138}