

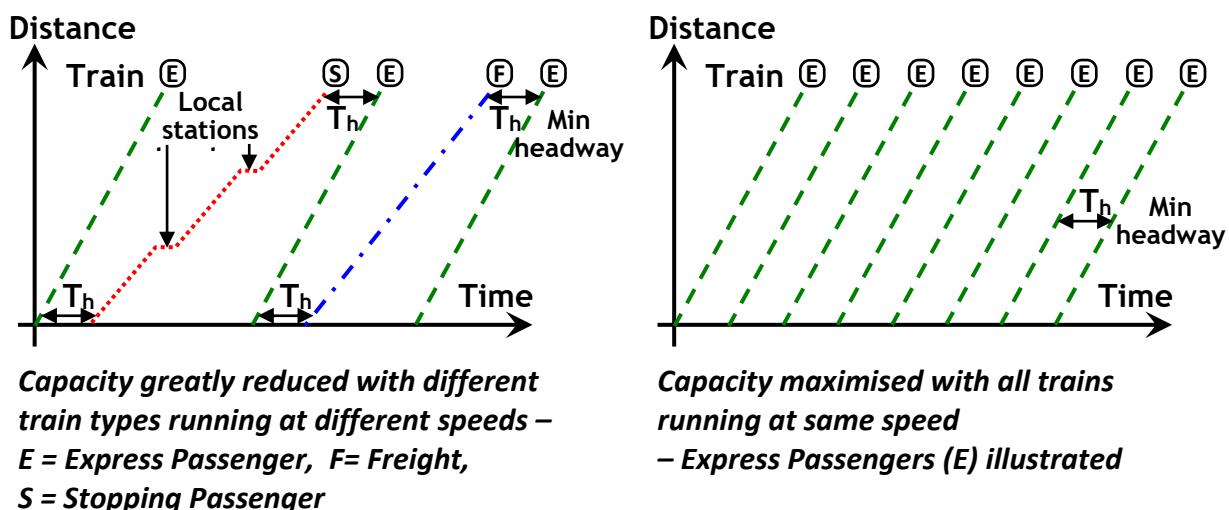
# HS2 & HSUK : CAPACITY COMPARED

Perhaps the best, and certainly the most repeated justification for the HS2 project is the need for improved capacity on an increasingly congested national rail network. HS2's capacity objective is neatly encapsulated in the statement made by former HS2 Ltd Technical Director Andrew McNaughton (on 30<sup>th</sup> November 2015) in evidence to the House of Commons HS2 Select Committee:

**“The aim of the HS2 project is to deliver hugely enhanced capacity and connectivity between our major conurbations.”**

The theory behind Mr McNaughton's statement is commonly accepted in both technical and political spheres. Capacity on the UK rail network is greatly limited by the 'mixed traffic' operation that prevails on most lines. As shown in Figure 1, the different types of traffic i.e. express passenger services, local 'stopping' services and freight tend to conflict with each other when running on a single pair of tracks.

The step-change implicit in the requirement for "hugely enhanced capacity" can only be achieved if the conflicts are reduced, with trains running at closer to the same speed and stopping pattern; this demands the provision of new tracks to enable the different traffic types to be segregated. The greatest capacity increase from the intervention of 2 new tracks will generally come about if the new tracks are provided for express (or high speed) passenger traffic, while the existing 2 tracks (or 4 tracks in the case of the West Coast Main Line south of Rugby) are dedicated to local passenger services and freight.



**Figure 1 : Reduced Capacity on 'Mixed Traffic' Railways**

The Government has cited the congestion on the existing West Coast Main Line south of Rugby as the most critical capacity problem facing the existing national rail network. And having defined the problem, HS2 is then presented as the solution. Whilst there is no doubt that capacity problems on the WCML urgently need to be dealt with, there are still many

logic gaps in the presented rationale, that must be resolved before any decision is taken to proceed with HS2:

- Is HS2 the best solution to address the WCML's problems?
- Are HS2's 2 new tracks sufficient, given the fact that all of its 18 train per hour capacity is already fully allocated to new high speed services?
- Are there capacity problems elsewhere on the national network in similar need of resolution?
- Is a more holistic solution required, that is capable of addressing all the capacity problems of the UK national network?

HSUK's analysis, presented on the following 3 pages, takes this holistic approach. It considers HS2's and High Speed UK's performance in enhancing capacity and resolving existing congestion in 8 different 'Congestion Zones', spread across the UK rail network. Specifically, it considers whether either proposal will provide the 2 new tracks necessary to achieve the required "hugely enhanced capacity". For each Zone, a mark (out of either 10 or 20) is awarded, and these marks are summed to give an overall aggregate score (out of 100).

It should be noted that HS2 has been awarded a negative score for its transpennine connectivity performance. This is the result of HS2 Ltd having developed its north-south routes in Yorkshire and Greater Manchester with no thought for transpennine connectivity; this will cause huge additional difficulty for the development of efficient Northern Powerhouse Rail (NPR) links between the principal cities of the North. For further details see *The Northern Poorhouse – How the Transport Establishment failed the People of the North*.

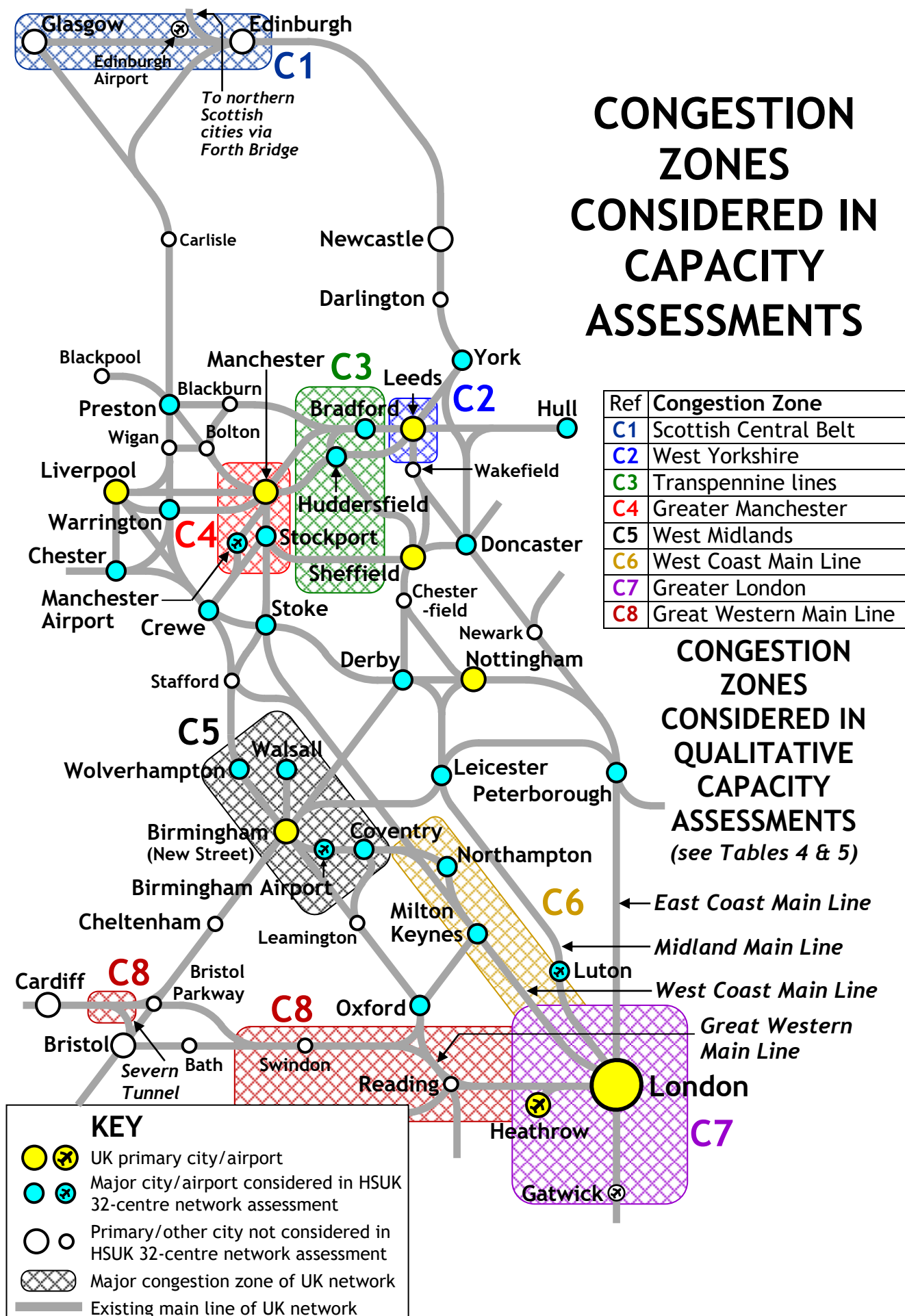
Similar issues apply in the Midlands with the belated retrofitting of the 'Midlands Rail Hub'.

The results for HS2 and HSUK are tabulated below:

Candidate Scheme	Nationwide Capacity Score
<b>HS2</b>	<b>9/100</b> (see Table 4)
<b>High Speed UK</b>	<b>82/100</b> (see Table 5)

**Table 2 : Nationwide Capacity Scores for HS2 and High Speed UK**

As with every other aspect of HS2's woefully inadequate performance, HS2's failure to resolve nationwide capacity problems is symptomatic of a deeper failure to take the necessary overview of national network performance. A project with HS2's nationwide aims cannot be delivered by the essentially corridor-specific approach taken by HS2 Ltd. Instead, it demands the more holistic network-wide approach taken by HSUK, by which its national strategy for high speed line development will provide the required additional pair of tracks on all principal main line corridors.



**Figure 3 : Congestion Zones considered in Nationwide Capacity Assessment**

# HS2 NATIONWIDE CAPACITY ASSESSMENT

Ref	Location	Congestion relief/Capacity improvement achieved	Score
<b>C1</b>	<b>Scottish Central Belt</b> <i>between Edinburgh and Glasgow</i>	HS2's west-sided approach to Scotland, with separate routes to Glasgow and Edinburgh splitting at Carstairs, is poorly aligned with the Scottish aspiration for a new high speed route directly linking Glasgow-Edinburgh Airport-Edinburgh. Any Edinburgh-Glasgow high speed route based on current HS2 proposals will offer poor journey times and fail to include Edinburgh Airport.	1/10
<b>C2</b>	<b>West Yorkshire local network</b> <i>focussed on Leeds</i>	Although new terminus platforms will be built for HS2 trains at Leeds, HS2 will do nothing to relieve present congestion in the existing platforms. Instead, congestion at Leeds seems likely to increase given the inability of HS2's proposed layout to accommodate through services from London to Bradford, Harrogate and the Aire Valley.	0/10
<b>C3</b>	<b>Transpennine lines</b> <i>Manchester to Leeds &amp; Sheffield</i>	HS2 does nothing to improve the capacity of any transpennine route. Instead, proposed HS2 routes to and stations in Leeds, Sheffield and Manchester, all developed to London-centric priorities, will compromise future delivery of efficient NPR transpennine links. Hence a negative score has been awarded.	-5/10
<b>C4</b>	<b>Greater Manchester local network</b> <i>focussed on Manchester Piccadilly</i>	Although new terminus platforms will be built for HS2 trains at Manchester Piccadilly, HS2 will do nothing to relieve present congestion either in the station or on its primary approach route via Stockport. Current 'Northern Hub' strategies are only incremental and will not deliver the required step-change in capacity; moreover, the entire Greater Manchester network will remain critically dependent upon the existing 2-track railway from Manchester Piccadilly (Platforms 13/14) via Oxford Road to Deansgate.	0/10
<b>C5</b>	<b>West Midlands local network</b> <i>focussed on Birmingham New Street</i>	The selection of Curzon Street as HS2's Birmingham station will achieve only minimal congestion relief at New Street. However, any new capacity at New Street will be compromised by the disconnection between local/regional services at New Street, and high speed services terminating at Curzon Street. Midlands Rail Hub proposals focussed on Moor Street (adj. Curzon Street) will only add limited capacity across restricted areas.	2/10
<b>C6</b>	<b>West Coast Main Line</b> <i>from Euston to Rugby</i>	HS2's congestion relief to the WCML is greatly compromised by its lack of interconnection with the WCML, and the political need to maintain express intercity services to bypassed cities such as Coventry and Stoke. Moreover, with only 2 tracks, it lacks the capacity to serve all major cities within its 'Zone of Influence', or to provide direct regional links to Heathrow.	8/20
<b>C7</b>	<b>Greater London</b> <i>all quadrants, NW,NE,SW,SE</i>	Any capacity relief that HS2 will deliver for Greater London will naturally be confined to the north-west quadrant. The extra capacity that it will bring to the WCML is compromised by the continued need for commuters to transfer to the Tube or Crossrail 2 at Euston, and by the huge disruption associated with the proposed expansion and reconstruction of Euston Station.	3/20
<b>C8</b>	<b>Great Western Main Line incl. Severn Tunnel</b>	HS2's general north-south orientation prevents it from providing significant capacity relief to the GWML. Additionally, HS2's design with a terminus station in Birmingham effectively prevents HS2 services extending to Bristol, Cardiff etc.	0/10
<b>Nationwide Capacity Score (out of 100)</b>			<b>9</b>

Table 4 : HS2 Nationwide Capacity Assessment

# HSUK NATIONWIDE CAPACITY ASSESSMENT

Ref	Location	Congestion relief/Capacity improvement achieved	Score
<b>C1</b>	<b>Scottish Central Belt</b> <i>between Edinburgh and Glasgow</i>	HSUK's east-sided approach to Scotland creates a unified high speed route to Edinburgh and Glasgow. This allows direct high speed services from Edinburgh and Glasgow to most principal UK cities. HSUK's proposals also align with Scottish aspirations for a new high speed intercity route directly linking Glasgow-Edinburgh Airport-Edinburgh, and provide 2 new tracks between the 2 cities.	10/10
<b>C2</b>	<b>West Yorkshire local network</b> <i>focussed on Leeds</i>	HSUK's strategy to create a dedicated route for high speed services through Leeds, achieved through 4-tracking of approach route, will greatly increase capacity for local services. Construction of a new Stourton-Neville Hill link will allow many terminating services to be converted to through services. Together these 2 measures will allow capacity for local services to be approximately doubled.	10/10
<b>C3</b>	<b>Transpennine lines</b> <i>Manchester to Leeds &amp; Sheffield</i>	HSUK's 'spine & spur' configuration incorporates a transpennine link (via the restored Woodhead corridor) as an integral part of network development. This will relieve congestion on all existing transpennine routes, and also creates the opportunity for a new transpennine freight route and a Sheffield-Manchester lorry shuttle	10/10
<b>C4</b>	<b>Greater Manchester local network</b> <i>focussed on Manchester Piccadilly</i>	HSUK's transpennine spur, serving both Manchester and Liverpool, demands a new east-west cross-Manchester tunnel with underground platforms at Manchester Piccadilly. This new facility - linking to Huddersfield, Sheffield and Stockport in the south and east, and to Liverpool and Bolton in the north and west, will also provide major new capacity for local services. This will greatly augment and reinforce current 'Northern Hub' strategies, and also offer a much more resilient local network.	10/10
<b>C5</b>	<b>West Midlands local network</b> <i>focussed on Birmingham New Street</i>	HSUK's strategy of 4-tracking key approach routes into Birmingham New Street (from Coventry, Derby and Wolverhampton/Walsall) enables local services to be segregated from express intercity services. This creates a step-change in capacity, and with the additional benefit of new routeing options created by HSUK, it is no longer necessary to terminate or reverse services at New Street; comprehensive 'through' operation will hugely increase platform capacity and allow much more frequent local services.	10/10
<b>C6</b>	<b>West Coast Main Line</b> <i>from Euston to Rugby</i>	HSUK's 4 tracks and its frequent interconnection with the WCML will deliver much greater congestion relief and resilience than HS2. With 4 tracks, HSUK has sufficient capacity to serve all major cities within its 'Zone of Influence' (including Coventry and Stoke) and also to provide direct links from all these cities to Heathrow.	20/20
<b>C7</b>	<b>Greater London</b> <i>all quadrants, NW,NE,SW,SE</i>	HSUK will deliver capacity relief for Greater London in both the north-west quadrant and - on account of its transformation of Heathrow's rail links - in the south-west quadrant also. Unlike HS2, its strategy to transfer commuter flows to Crossrail, or to a future 'Westlink' tunnelled route linking Euston and Charing Cross, will have massive beneficial effects upon current WCML commuter flows, eliminating the need to transfer to Tube lines at Euston.	10/20
<b>C8</b>	<b>Great Western Main Line incl. Severn Tunnel</b>	HSUK's general north-south orientation prevents it from providing significant capacity relief to the GWML. A complementary 'High Speed West' scheme is currently under development. Proposed HSUK services via Birmingham New St will ensure full connection of Cardiff, South Wales, Bristol & West Country to national network.	2/10
<b>Nationwide Capacity Score (out of 100)</b>			<b>82</b>

Table 5 : HSUK Nationwide Capacity Assessment