

HIGH SPEED UK RAILFREIGHT STRATEGY

The UK high speed rail initiative has been heralded as a major opportunity for railfreight. The accepted wisdom, advanced in support of the HS2 proposals, is that the transfer of express passenger flows from congested existing intercity routes to new high speed lines will free up capacity which can be exploited by freight traffic, as well as local passenger traffic.

HS2 Railfreight Issues

However, the potential gains for railfreight are hugely compromised by HS2's incomplete coverage, its fundamental lack of capacity and its inefficient configuration. With HS2 configured as a London-focussed 'Y', it can do nothing to enhance transpennine route capacity or the restricted structure gauge that greatly hinders the passage of container traffic; and it should be noted that more local initiatives such as the Northern Hub will do very little to promote cross-Manchester freight flows, with all transpennine flows compelled to pass through either Victoria or Piccadilly stations.

As for capacity, with HS2's London-West Midlands 'stem' only comprising 2 tracks, it cannot provide the extra train paths necessary to access all the major cities (such as Coventry, Stoke, Leicester and Derby) which are currently integral to the UK intercity network. Although HS2 plans currently show the express services to these cities reduced in frequency, and regressing to 'regional' status with more stops added (thereby creating the capacity for more freight traffic), a more probable outcome is that local political pressure will result in the retention of many of these express services. The likely consequence for overall network capacity is a severe 'double negative'; the express trains will be poorly-filled due to abstraction of much of the core passenger flows onto the high speed line, and their continued operation will prevent new 'paths' being released for freight traffic.

The Need for an Alternative Way Forward

Reviewing the many flaws of the HS2 proposals, it is clear that a more sophisticated agenda must be developed for UK railfreight, to enable full advantage to be taken of the opportunities created by the UK high speed rail initiative. This agenda would be predicated on the following 'logic steps':

- The economic and environmental imperatives for improvements in freight connectivity and capacity are similar to those driving the development of high speed lines for passenger traffic.
- It is likely that new high speed passenger lines will comprise the vast majority of new-build railway infrastructure in the forthcoming decades.
- With new high speed lines generally inaccessible to slower freight traffic, the gains in connectivity and capacity for freight will have to be achieved along existing and/or restored routes.
- These gains will be maximised if a comprehensive network of routes can be established where freight becomes 'prime user'.
- This does not preclude these lines being used also for local passenger services; however, it is vital to achieve separation between freight traffic and express passenger services (on account of greatly differing speed profiles which tend to consume capacity).
- The gains for rail freight traffic will be greatly increased if the new freight network can be constructed to a larger 'structure gauge' to accommodate freight wagons both taller and wider in cross-section than those currently operating.
- Such enhancements will require major rebuilding of much of the existing railway infrastructure; the necessary works will be greatly facilitated if the routes comprising the enhanced freight network:
 - avoid major tunnels;
 - avoid major stations;
 - follow 'decriticalised' lines from which existing critical flows can be diverted to parallel routes, to permit the blockades necessary for reconstruction of bridges and respacing of tracks.
- Although electrification of all UK trunk rail routes, both passenger and freight, is taken as a 'given', it is nonetheless advantageous if the routes to be upgraded are currently *not* electrified.

The Need for Enhanced Structure Gauge

The opportunities for UK railfreight are greatly limited by the restrictive 'structure gauge' to which UK railways were constructed. This is considerably smaller than the 'Bern Gauge' that generally applied in the construction of continental main line railways (which has since developed to the 'UIC-C' 'Eurogauge' or Continental Gauge). As a consequence, the following issues apply for railfreight in the UK:

- Wagons designed for operation on continental railways cannot generally operate on UK railways. This has greatly restricted the potential for railfreight flows through the Channel Tunnel. Although some freight operation along HS1 has been allowed, this only extends the range of such services to London, and the running of such trains (which can only take place at night) places major restrictions on essential track maintenance.

- The restrictive UK structure gauge also has major implications for the operation of container traffic. This generally comprises the transport of 9'6" maritime containers from southern and south-eastern ports to the major conurbations of the Midlands, the North and Scotland. To permit these containers to be transported on flatbed wagons, it has been necessary to undertake major programmes of structural modifications, including track lowering in tunnels and widespread reconstructions of overbridges. This has generally seen the structure gauge made taller; but it has remained essentially the same width.
- The inherent inefficiency of maritime containers and other 'swapbody' solutions - generally smaller payload/volume than the 3-axle semi-trailer favoured by the road haulage industry, and requiring two intermediate cycles of unloading and reloading on a typical journey (from local lorry to long distance train, then back to local lorry) - means that rail has only a small market share in most internal freight flows between UK centres. Road haulage can generally offer greater economy and flexibility, particularly in the handling of 'door-to-door' traffic.
- There is clear potential for major economic and environmental gains, if either articulated trailers or (ideally) entire lorries could be carried on trains. But this imposes demands for height and width that are beyond what UK structure gauge can accommodate, and the necessary modifications and reconstructions have always been considered unviable. (Some solutions have been developed, to allow certain trailers to be carried on rail wagons, but these have involved both significant limitations on the profiles of the vehicles carried (usually with rounded corners rather than the square cross-section of standard trailers) and also major complexities in 'parking' the trailer on the railway wagon).
- To offer a viable proposition for the carriage of road vehicles on rail wagons, development of routes with enhanced structure gauge is essential. For articulated trailers (including the standard 3-axle semi-trailer) viable 'piggyback' solutions have been developed within the UIC-'C' modern Eurogauge. This is widely considered to be the largest practicable structure gauge capable of widespread application along selected routes on the UK rail network.
- But for the ideal, of transporting entire lorries by rail with simple drive on / drive off capability (as per the Channel Tunnel 'Le Shuttle' operation), a significantly larger structure gauge is required. This generally restricts such lorry shuttle operations to new-build routes such as sub-sea or trans-Alpine tunnels; and the commercial viability of these services is greatly enhanced by the absence of alternative road routes.

Development of 'Eurogauge UK' Railfreight Proposals

Following the principles listed above, the 'Eurogauge UK' concept has been developed to complement High Speed UK. In terms of strategic interconurbation routeing, this will achieve the same comprehensive interconnectivity as High Speed UK, following the same broad corridors, and exploiting the capacity released and/or created by the construction of the new high speed lines.

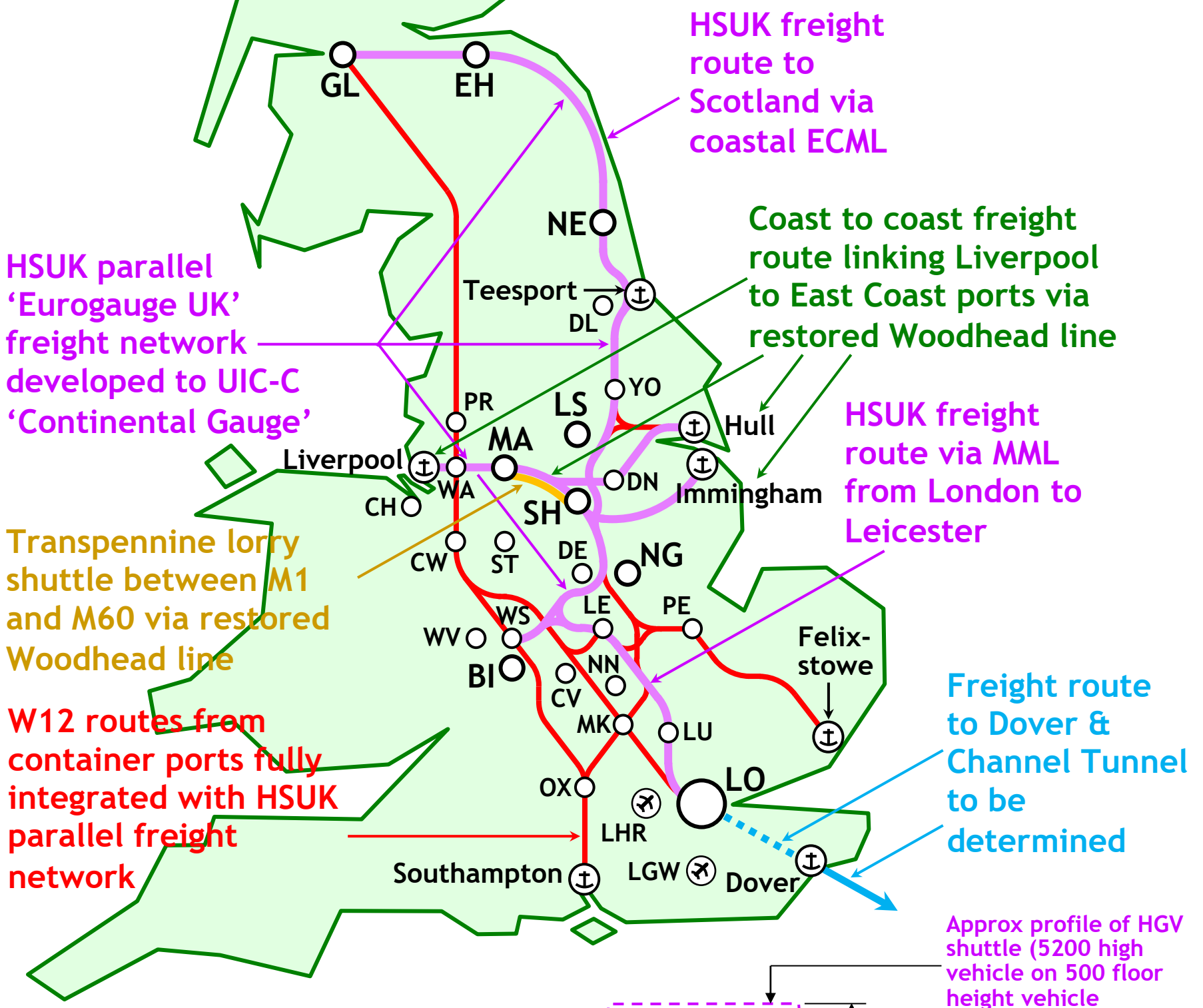
The Eurogauge UK system will generally be developed to UIC-C gauge. With appropriate development of a similarly enhanced route from the Channel Tunnel to north London (not covered under this paper) to connect to Eurogauge UK, this will:

- open up the major UK conurbations of the Midlands, the North and Scotland to long-distance railfreight flows from across the European Community;
- meet the aspiration of Northern Powerhouse communities for a 'freight superhighway linking Liverpool and the Humber';
- allow articulated lorry trailers to be transported between a wide range of terminals in the principal regional conurbations;
- create a unique opportunity for a 'rolling road' lorry shuttle operation along the restored Woodhead route linking Greater Manchester and South Yorkshire, relieving severe HGV congestion on the A628T.

The greater transport efficiencies introduced should offer major economic benefits, and the consequent modal shift from high-emitting road transport to much lower-emitting rail will generate step-change reductions in freight transport emissions. Given the current dominance of road haulage in the transport of freight, it is clear that the greatest benefits - both economic and environmental - will be gained with the capture of a significant proportion of the articulated trailer market.

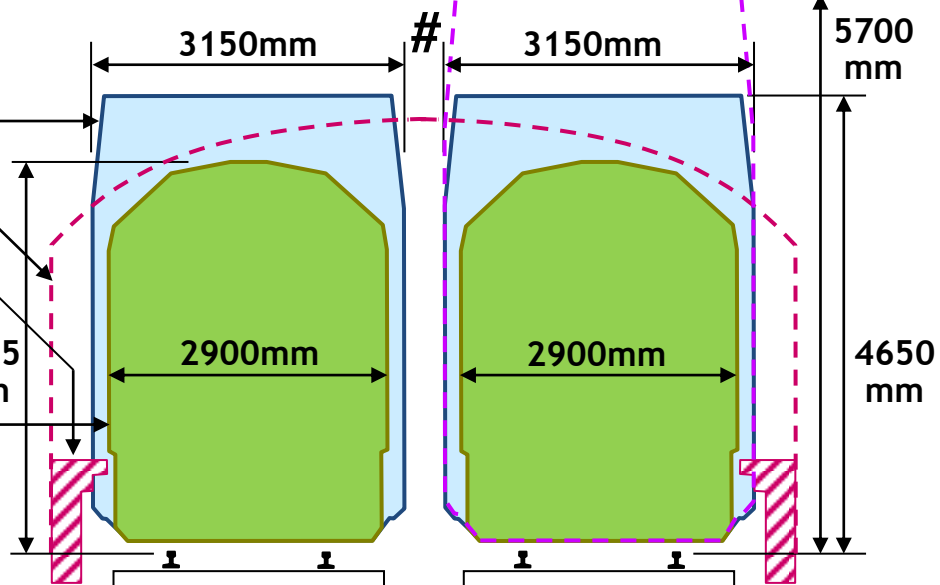
The routes selected for upgrade to the larger UIC-C structure gauge can be characterised into the following 4 geographical zones, with different considerations applying in each.

HSUK EUROGAUGE UK FREIGHT NETWORK



Continental gauge 'UIC-C' wagons foul most over-bridge and platform structures, with insufficient passing clearance #

Track spacings & structures sized for UK gauge 'W6' wagons



**HGV SHUTTLE
CONTINENTAL
GAUGE &
UK GAUGE
WAGON
PROFILES**

London to East Midlands

With High Speed UK routed along the M1 corridor from London to Leicester, and with connections established to the major intermediate community of Luton, the existing Midland Main Line is effectively rendered redundant as a trunk intercity route. Upgrade to UIC-C gauge appears to be relatively simple. With most of the route comprising 4 tracks (from London to Glendon Junction, where the MML diversionary route via Corby diverges, the route either comprises 4 tracks now, or was constructed with 4 tracks) the blockades necessary to achieve the necessary greater clearances can be sustained with relatively small disruption. There are only 3 tunnels along the line of route (at Elstree and Amphill, where major works will be required, and also Sharnbrook).

Within the London conurbation, High Speed UK will closely follow the corridor of the Midland Main Line, which offers by far the best 'axis of approach' to the proposed terminus at Euston. This renders the MML locally unsuitable as a primary freight route; and in any case, this route bypasses the major freight terminals in the Willesden area. Accordingly, Eurogauge UK will follow the WCML (now relieved of much of its trunk traffic by HSUK) northwards from Willesden to Watford Junction, where it will join the single-track St Albans Abbey branch. This line was constructed with passive provision for future doubling, which should greatly facilitate the necessary upgrade to 2 tracks. A short link following the M25 will allow Eurogauge UK to connect to the Midland Main Line.

As noted previously, the Midland Main Line will be effectively superseded as a trunk main line by HSUK, and for most of its southern length, it has been constructed to a 4-track profile. This makes the MML an ideal trunk freight route as far north as Knighton Junction in Leicester, where it will deviate onto the Ivanhoe Line to Coalville and Burton on Trent.

HSUK's routing via the existing Leicester London Road Station will occupy all 4 tracks, and will consume all available rail capacity through Leicester for high speed and local passenger traffic. This makes it essential to reroute all current freight traffic by establishing and/or upgrading diversionary routes around Leicester, via Corby. Accordingly, new chords are proposed at Manton, and at Glendon, to allow the existing Felixstowe-Nuneaton freight traffic to be diverted via Corby and Market Harborough.

West and East Midlands to Yorkshire & North-East

Between the Midlands and the North-East, Eurogauge UK will exploit much spare capacity that was originally devoted to serving the now-moribund deep-mined coal industry. It is proposed to follow existing routes that are generally either:

- greatly underused (eg Ivanhoe line between Leicester and Burton, Wichnor to Lichfield, Derby Avoider, Erewash Valley line between Trent Junction and Chesterfield, Chesterfield-Rotherham 'Old Road', Stillington Branch between Stockton and Ferryhill), or;
- completely abandoned (eg Walsall-Lichfield, Swinton-Normanton section of Midland Main Line in Yorkshire, Leamside line from Ferryhill to Pelaw), or;
- proposed for upgrade to facilitate High Speed UK, with new high speed tracks provided to supplement existing route (eg CrossCountry main line from Wichnor to Stenson Junctions, East Coast Main Line from York to Darlington).

In respect of the York-Darlington ECML, it should be noted that 2 options are under active consideration, either to provide an additional 2 tracks alongside the existing 4-track main line, or to construct an entirely new route between Church Fenton and Northallerton, following the corridor of the A1(M).

Transpennine

The Eurogauge UK system must address Transport for the North's aspiration for a 'Freight Superhighway connecting Liverpool and the Humber'. This will extend across the Pennines, following the same Woodhead corridor as proposed for High Speed UK, but largely following the original track alignment rather than the new-build high speed tracks. But rather than pass through central Manchester (note that all existing transpennine freight flows must pass through the heavily congested Piccadilly and Victoria stations), the redundant 'Tiviotdale' rail route through south Manchester and Stockport will be restored to comprise a freight bypass. This will allow transpennine freight flows to extend along a largely dedicated route to the West Coast Main Line, and to the Port of Liverpool.

The need either for a dedicated freight route, or for a route on which freight is 'prime user', can be appreciated from the fact that a single large (20,000 TEU) container ship unloading at Liverpool translates as approximately 180 freight trains of 775 metres length to carry all the containers away from the port. Such volumes would be impossible to accommodate on existing congested trunk routes. Hence a strategy must be developed for a dedicated network of freight lines along which freight traffic would have priority. This demands not only a new transpennine freight route, but also routes extending to east and west towards the ports on both west and east coasts.

The increased capability of a dedicated route, no longer subject either to the loading gauge/capacity constraints of the existing transpennine rail routes, or to the congestion of either the M62 or of the entirely inadequate A628(T) Manchester-Sheffield 'Woodhead Road', should transform vital freight links across the north of England. This will offer the following 4 key benefits:

- Maritime containers, unloaded at the port of Liverpool, can be transported by rail across the Pennines to east-sided communities, and likewise from Immingham, Hull and Teesport to the North-West.
- A 'land bridge' link could be established between Liverpool and East Coast ports; this would enable containers unloaded from transatlantic freighters at Liverpool's new 'Atlantic Gateway' Superport to be taken across the Pennines, and loaded aboard smaller vessels en route to Baltic and Scandinavian ports.
- Lorry trailers can be placed upon rail wagons (as per 'piggyback' operations proposed elsewhere on Eurogauge UK).
- A lorry shuttle will link Bredbury on the M60 in Greater Manchester with Tinsley on the M1 in South Yorkshire, thus allowing trunk HGV bans to be imposed on the A628 Woodhead road, the A57 Snake Pass and the A623 Peak Forest road. ***This operation will demand enhanced structure gauge to allow trains approx 5700mm tall to pass.***

With no motorway linking the Greater Manchester and South Yorkshire conurbations, HGV traffic has no option but to follow the single-carriageway and steeply-graded A628(T), causing major congestion and environmental impacts in the Longdendale villages. Greater environmental concerns within the Peak District National Park effectively preclude any prospect of a 'Trans-Peak' motorway being built (or even a local bypass), and it seems clear that impacts upon the Longdendale villages will remain at intolerable levels unless radical alternative solutions can be put in place.

Studies are currently being undertaken into outline proposals for a transpennine road tunnel. At the outset, the favoured option appeared to be a 31km long tunnel believed to extend from Mottram in the west (at the end of the M67) to Deepcar in the east (on the A616). Whilst this would avoid most of the environmental damage associated with a surface route, these proposals for what would be the longest road tunnel in the world (and the longest in the UK, around 9 times longer than the current longest, the 3.26km long Queensway Mersey tunnel) would give rise to a huge range of safety and 'driving culture' issues. As such, these proposals are not considered to be practicable, and it seems essential that more realistic rail-based initiatives are considered.

It is significant to note that after much investigation, Transport for the North has concluded that only a short road tunnel of the order of 7km length (essentially, matching the existing Woodhead rail tunnels) would be practicable, and this raises once more the intractable issue of the massive intrusion of a surface motorway within the National Park

Of the 4 rail improvements listed in the preceding paragraphs, the proposed lorry shuttle will be of particular value in reducing the mostly short-haul HGV flows which cause the congestion in Longdendale. It is envisaged that the lorry shuttle will operate on a drive-on-drive-off basis (similar to the Channel Tunnel 'le Shuttle' operation) with a 10-15 minute service frequency and a journey time of around 35 minutes from M60 to M1. This is far faster than can be achieved along the A628(T) Woodhead Road, even when no congestion exists, or on circuitous motorway routes via M62 and M1; and with sufficient volume, it appears viable to set fares at a level similar to the fuel/maintenance/depreciation costs that road hauliers bear in current HGV operations.

With such a service offer, it becomes reasonable to impose trunk lorry bans on all Trans-Peak roads between the M62 and the A50, including (from north to south):

- A635 Greenfield-Holmfirth
- A628(T) Woodhead Road
- A57 Snake Pass
- A623(T) Peak Forest road
- A6 Buxton-Matlock

These lorry bans should achieve major environmental savings which will mitigate the inevitable intrusion arising from construction of the new alignments for HSUK transpennine high speed services.

Borders and Scotland

With High Speed UK following an inland alignment via Wooler (similar to that chosen by Thomas Telford in the early 19th Century for his cross-Border road) the existing coastal route via Berwick will become effectively redundant as an intercity railway, and its function will regress to that of a local railway serving the communities of Dunbar, Berwick, Alnmouth and Morpeth. Even allowing for their rural hinterlands, these communities collectively comprise little more than 100,000 population, insufficient to sustain a long coastal route with high maintenance requirements.

Eurogauge UK will transform the economics of the coastal route, with the increased freight flows achievable through the greater load-carrying capability providing the extra revenues crucial to supporting local passenger flows. With no tunnels or major stations on the route north of Newcastle, the major challenge will be in upgrading the route across the many viaducts, typically spanning rivers in deep valleys. Generally, these structures need to be widened at track level by up to 2 metres, to accommodate both the wider trains and modern requirements for safer trackside access. This will be accomplished by a saddling/redecking process which will effectively seal the structure from water ingress and significantly extend its life. Only at the 'listed' Royal Border Bridge will an alternative strategy be required, probably involving local singling of the 2-track route.

Beyond Edinburgh, it is proposed for the Eurogauge UK route to follow the Edinburgh Suburban lines and the Shotts route to Scotland's principal railfreight facility at Mossend, near Glasgow.

‘Eurogauge UK’ Railfreight Proposals Mapped in Detail

NND8/9 : PARALLEL DEVELOPMENT OF ‘EUROGAUGE UK’ RAILFREIGHT NETWORK

High Speed UK’s routeing, closely aligned with and frequently connected to existing rail corridors, presents the opportunity to create a parallel national network of lines on which freight becomes the prime user. This ‘Eurogauge UK’ network is set out in diagram NND8. This system, following ‘decriticalised’ routes generally clear of major tunnels and stations, has the potential for ‘gauge enhancement’ ie creating the larger clearances necessary to permit the operation of larger ‘Eurogauge’ Continental wagons and hence ‘through’ European freight services. This would harmonise with other HSUK proposals, to develop transpennine lorry shuttle operations and create a coast-to-coast freight railway via the restored Woodhead corridor.

Diagram NND9 provides a key to the regional strategies outlined in the following paragraphs.

LBC10 : LONDON-BIRMINGHAM FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

With High Speed UK established as the primary route between London and the East Midlands, all intercity traffic linking London-Luton-Leicester-Nottingham/Derby-Sheffield can be diverted away from the existing Midland Main Line. This effectively ‘decriticalises’ this route; and with 4 tracks (either existing or abandoned) for most of its length, and with few tunnels, this comprises an ideal corridor to develop as the primary north-south Eurogauge UK spinal route on which a) freight becomes ‘prime user’ and b) potential exists for upgrading to Eurogauge operation.

Eurogauge UK, routed along the corridor of the Midland Main Line, would effectively supersede the West Coast Main Line as the primary UK north-south freight artery. Connection to the West Coast Main Line at Watford via an upgraded St Albans Abbey branch allows freight flows to be diverted away from critical sections of Midland Main Line south of the M25, and also to access the major railfreight facilities in the Willesden area. Connections between MML and WCML also via Bedford-Bletchley and Leicester (Wigston)-Nuneaton would assure maximum operational resilience.

EMN6 : EAST MIDLANDS FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

The routeing of HSUK through Leicester Station, and northwards along the Midland Main Line as far as Syston, will effectively preclude freight operation along this section of route. This will affect both north-south Midland Main Line flows, and east-west Felixstowe-Nuneaton container flows. Fortunately, it is possible to divert both flows via Corby, requiring only the construction of new chords at Manton and Glendon Junctions.

The diagram also identifies the north-south Eurogauge UK freight spine, following Midland Main Line to Leicester, ‘Ivanhoe’ Line from Leicester to Burton and north-eastwards via the Derby Avoider and the Erewash Valley Line (and also south-westwards towards the West Midlands). Intensified freight operation along the Ivanhoe Line would compel major works to eliminate the road level crossing in Coalville. Where this route interfaces with the CrossCountry Main Line in the Burton area, extra capacity will be provided through the proposed general 4-tracking of this route between Birmingham and Derby.

The north-south Eurogauge UK route will continue via the Derby Avoider to Toton Yard, and continue parallel to HSUK along the Erewash Valley line, and enter South Yorkshire along the Chesterfield-Rotherham ‘Old Road’.

WMN9 : WEST MIDLANDS FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

This diagram illustrates the High Speed UK strategy for development in the West Midlands of ‘prime user’ railfreight corridors clear of congested intercity and commuter routes. This strategy would see existing freight flows currently routed via central Birmingham diverted to more peripheral routes - for instance, WCML container flows to Bescot diverted via Nuneaton and the Sutton Park line, and CrossCountry flows diverted onto a restored Stourbridge-Walsall-Wichnor route. The latter would require restoration of the abandoned Stourbridge-Dudley-Walsall, and Walsall-Brownhills-Lichfield lines. For the section via Dudley, competing aspirations for extensions of the West Midlands Metro must be taken into account.

Restoration of the Stourbridge-Wichnor route harmonises well with wider aspirations for the development of ‘Eurogauge UK’. The north-south spine of this system would be routed via the Midland Main Line and the Ivanhoe Line, joining the CrossCountry Main Line (upgraded to 4 tracks) at Burton on Trent; the restored Walsall-Lichfield section would offer direct access to Bescot Yard, and possibly other Black Country industrial areas.

PRC7 : POTTERIES FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

Currently, little if any railfreight is conveyed to or from the Potteries conurbation. However, given its status as a major hub of UK industry, it is important that railfreight facilities are maintained, and that capacity is provided to accommodate new freight flows. HSUK satisfies this requirement through the 4-tracking of the core Stone-Longport section, which allows slower freight and local passenger flows to be segregated from

express passenger flows. Equally importantly, the HSUK proposals also make allowance for approach routes with sufficient capacity, particularly from the West Midlands where HSUK proposals for faster and higher-volume flows along the Bushbury-Stafford Grand Junction route will necessitate the diversion of freight flows onto the Walsall-Cannock-Rugeley line.

TPW8,9,10 : TRANSPENNINE FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

The HSUK scheme to build a high speed route along the Woodhead corridor through the Peak District National Park is reliant upon the parallel scheme to restore the abandoned Woodhead route as a new transpennine freight route that will address the economic and environmental aspirations of the Northern Powerhouse.

Existing transpennine routes lack both the route capacity and the physical size (in tunnels and bridges) to accommodate 9'6" marine containers on standard wagons. This hugely limits the hinterland of Northern ports (Liverpool on the west coast, Immingham, Hull & Teesport on the east coast), and this in turn impacts greatly upon Northern economic activity. Restoration of Woodhead, along with restoration of routes bypassing Manchester along the Mersey Valley towards Liverpool, and also through South Yorkshire towards east coast ports, will provide the required step-change enhancement in both line capacity and structure profile.

Woodhead restoration raises the tantalising possibility of coast-to-coast freight links in line with the Transport for the North aspiration for a 'freight superhighway connecting Liverpool and the Humber'. This might comprise a 'land-bridge' operation in which containers on Transatlantic mega-freighters might be landed at Liverpool, transferred by rail to an East Coast port, and loaded aboard smaller ships en route to Scandinavia and the Baltic. This 'bulk-breaking' operation normally takes place at Rotterdam, but could equally well occur in the UK, offering significant resilience and diversity in the routing of containers. Of all the available East Coast ports, Immingham appears to offer the greatest potential, owing to its good rail links, uncongested approach routes (particularly via Brigg) and the potential to upgrade for Eurogauge operation.

Restoration of the Woodhead route also presents a unique opportunity to establish a lorry shuttle link between Greater Manchester and South Yorkshire. Currently, there is no motorway link between the two conurbations, and there is only the hugely-congested single carriageway A628(T) Woodhead Road. There have long been plans to construct a motorway over the Woodhead Pass - but this has always been precluded by environmental issues in the Peak District National Park. This leaves a very long tunnel (approximately 31km long) as the only alternative that might avoid serious intrusion upon the National Park - but after much investigation, Transport for the North has concluded that only short tunnels (~7km) are practicable, and this raises once more the intractable issue of the massive intrusion of a surface motorway within the National Park.

This leaves the HSUK scheme for a lorry shuttle operation, similar in principle to the 'Le Shuttle' operation through the Channel Tunnel, as the only practicable option.

NWN6 : NORTH-WEST FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

The HSUK strategy for enhanced transpennine railfreight can only be realised with a matching strategy to eliminate bottlenecks in central Manchester to allow freight flows to continue west towards Merseyside. Currently, with all diversionary routes having been abandoned during the Beeching era, all transpennine rail routes are focussed upon central Manchester and must pass through either Piccadilly or Victoria stations. These routes are already heavily congested, and they lack the capacity to accommodate significant increases in freight flows; upgrade for Eurogauge operation is clearly unfeasible. It is therefore necessary to scheme a new cross-Manchester freight route, and an onward route towards Merseyside and the Port of Liverpool, as part of the Eurogauge UK system.

This will involve the restoration of the abandoned 'Tiviotdale' Mersey Valley route via Stockport that was followed by the former Woodhead coal traffic, and also reestablishment of the abandoned or largely redundant Garston-Timperley route. This will create a largely dedicated freight route extending to Arpley Yard at Warrington on the WCML, and onwards to the Port of Liverpool, both to Garston Docks and also to the proposed Liverpool Superport at Seaforth Docks.

Connection of the cross-Manchester freight route to the CLC main line at Glazebrook will create an alternative rail access to the Trafford Park container terminal. This would avoid the congestion in the Manchester Piccadilly area that currently limits freight flows, and it would also permit Eurogauge operation.

YRS11 : YORKSHIRE FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

On the east side of the Pennines, (largely) dedicated freight routes must be developed to connect the upgraded Woodhead route to the principal ports of the Humber i.e. Immingham and Hull.

The route to Immingham would continue from Sheffield along the original Great Central route via Retford and Gainsborough. This is currently a lightly-used route, which runs clear of critical main line routes (note grade-

separated crossings of both Midland and East Coast main lines). Few major problems are anticipated in upgrading to Eurogauge operation.

The route to Hull will require restoration of 2 further abandoned routes - Worsbrough Vale (to bypass Barnsley) and Dearne Valley to Mexborough. The latter route is now partially blocked by urban and industrial development, and this will require 5km of completely reengineered route. The onward route to Hull would follow the Doncaster Avoider (thereby avoiding any conflict with the East Coast Main Line) and along existing routes via Goole to Hull. Again, few problems are anticipated in upgrading to Eurogauge.

The north-south Eurogauge UK spine route is projected to enter South Yorkshire via the Chesterfield-Rotherham 'Old Road', and continue northwards along the restored Dearne Valley route and the former Yorkshire Midland Main Line to Normanton. From there, the route will continue north through Castleford towards York.

The other major potential railfreight flow in the Yorkshire region should be noted - north-west to south-east along the Midland Aire Valley route through Leeds. Whilst these freight flows are currently small, owing to the demise of coal-fired power generation (note previous major coal flows along the Settle-Carlisle route from Scotland), it is possible that the proposed restoration of the Skipton-Colne route could lead to significant new transpennine flows along the Aire Valley route.

The potential for major conflicts with suburban and intercity passenger flows at Leeds West Junction in the throat of Leeds City Station should be noted. Previously these conflicts limited freight flows to a single train per hour in each direction. These problems will be greatly mitigated by HSUK proposals to direct express passenger flows into Leeds via a restored Farnley Viaduct which avoids Leeds West Junction; this will eliminate most of the conflicts between intercity passenger and freight traffic.

NCN7 : NORTH COUNTRY FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

This diagram illustrates potential alternative alignments of the proposed north-south Eurogauge UK freight spine along the Vale of York. This might follow the existing East Coast Main Line north of York, but - noting a probable ultimate requirement to expand this route to 6 tracks to accommodate high speed services along with existing passenger and freight services - an alternative, of routing freight traffic along a new alignment via Wetherby and Boroughbridge, located within the generally blighted strip of land between new A1(M) and former A1 (now A168), should also be examined.

The freight spine would follow the existing route via Yarm to Teesside, and onwards via Stillington and Leamside lines to Newcastle. Here, diversion of most intercity passenger traffic to the high speed line, and previous diversion of local services to the Tyne & Wear Metro, would permit the routing of trunk freight traffic via King Edward Bridge and Newcastle Central station. Noting the construction of King Edward Bridge and other structures with track in predetermined positions not capable of alteration, appropriate signalling measures would have to be employed, to exclude trains from adjacent tracks whilst Eurogauge wagons are passing.

SRS9 : SCOTTISH FREIGHT DEVELOPMENTS ASSOCIATED WITH HIGH SPEED UK

With Anglo-Scottish intercity services diverted onto High Speed UK's inland cross-Border route via Wooler, it becomes necessary to consider the future of the coastal ECML route via Berwick. Currently, intercity services (both East Coast and CrossCountry) call at Morpeth, Alnmouth, Berwick and Dunbar; but the service pattern is irregular and infrequent, and offers poor local connectivity. With a relatively small local population (collectively less than 100,000), there is insufficient traffic to support frequent local services; and with the clear difficulties of maintaining a coastal electrified railway, it is possible that continued operation of the line might be deemed unviable.





The HSUK strategy, of developing a Eurogauge freight route parallel to the high speed lines, provides an invaluable opportunity to develop a new 'base load' flow, that will transform the economics of the coastal ECML. With no tunnels, no major stations, and no critical flows that cannot be diverted, there is no serious impediment to undertaking the necessary works to enable taller and wider freight traffic to operate. (This is not possible with development of HS2 along the WCML corridor.) The major engineering challenges should not be underestimated; in particular, there will be a need to redeck most of the major viaducts on the route to accommodate wider-bodied trains, and on the 'listed' Royal Border Bridge at Berwick, it will probably prove necessary to single the line across the bridge.

Within Scotland, the Eurogauge UK freight spine is projected to continue via Edinburgh to terminate at Mossend Yard, near Motherwell. This will require a route to bypass Waverley Station, and upgrading of the 'Edinburgh Suburban' lines ('Edinburgh Subs') would appear to represent the best option. Beyond Edinburgh, the unelectrified 'Shotts' route offers by far the best route to access Scotland's principal railfreight facility at Mossend.

**HIGH SPEED UK:
PARALLEL DEVELOPMENT
OF CONTINENTAL GAUGE
RAILFREIGHT NETWORK :
'EUROGAUGE UK'**

DIAGRAM **NND 8**
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KEY

-  Eurogauge-cleared freight network & terminal
-  Lorry shuttle route
-  Dedicated high speed line
-  Principal intercity route

LO	LO																			
BI		BI																		
NG				NG																
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LS																				LS
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**EUROGAUGE UK
LINKS BETWEEN PRIMARY CITIES**

FOR DETAILS OF TRANSPENNINE
FREIGHT ROUTES, SEE HUK
TRANSPENNINE RAIL STRATEGY
DIAGRAMS TPW8, 9 & 10

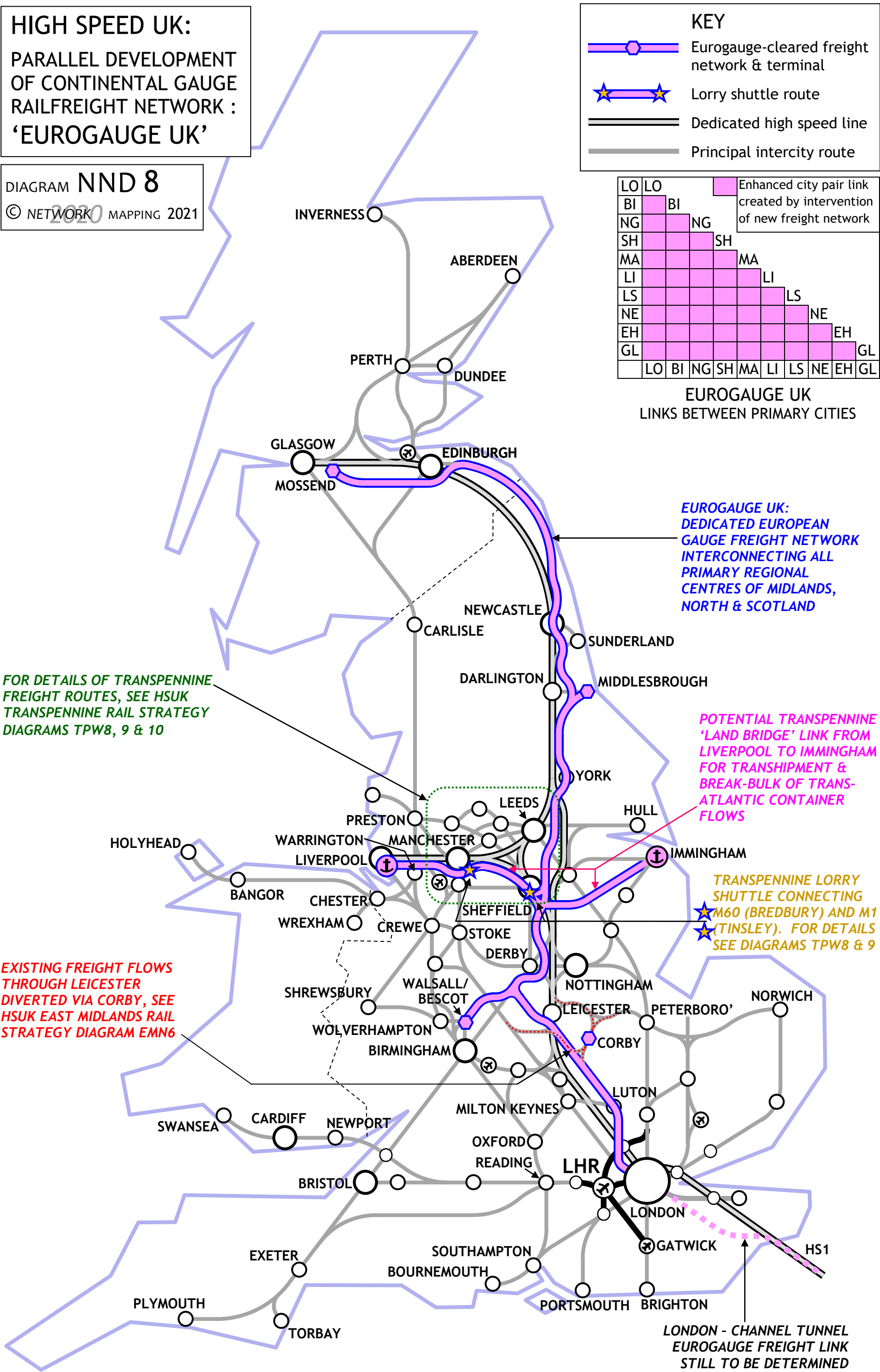
**EUROGAUGE UK:
DEDICATED EUROPEAN
GAUGE FREIGHT NETWORK
INTERCONNECTING ALL
PRIMARY REGIONAL
CENTRES OF MIDLANDS,
NORTH & SCOTLAND**

POTENTIAL TRANSPENNINE
'LAND BRIDGE' LINK FROM
LIVERPOOL TO IMMINGHAM
FOR TRANSHIPMENT &
BREAK-BULK OF TRANS-
ATLANTIC CONTAINER
FLOWS

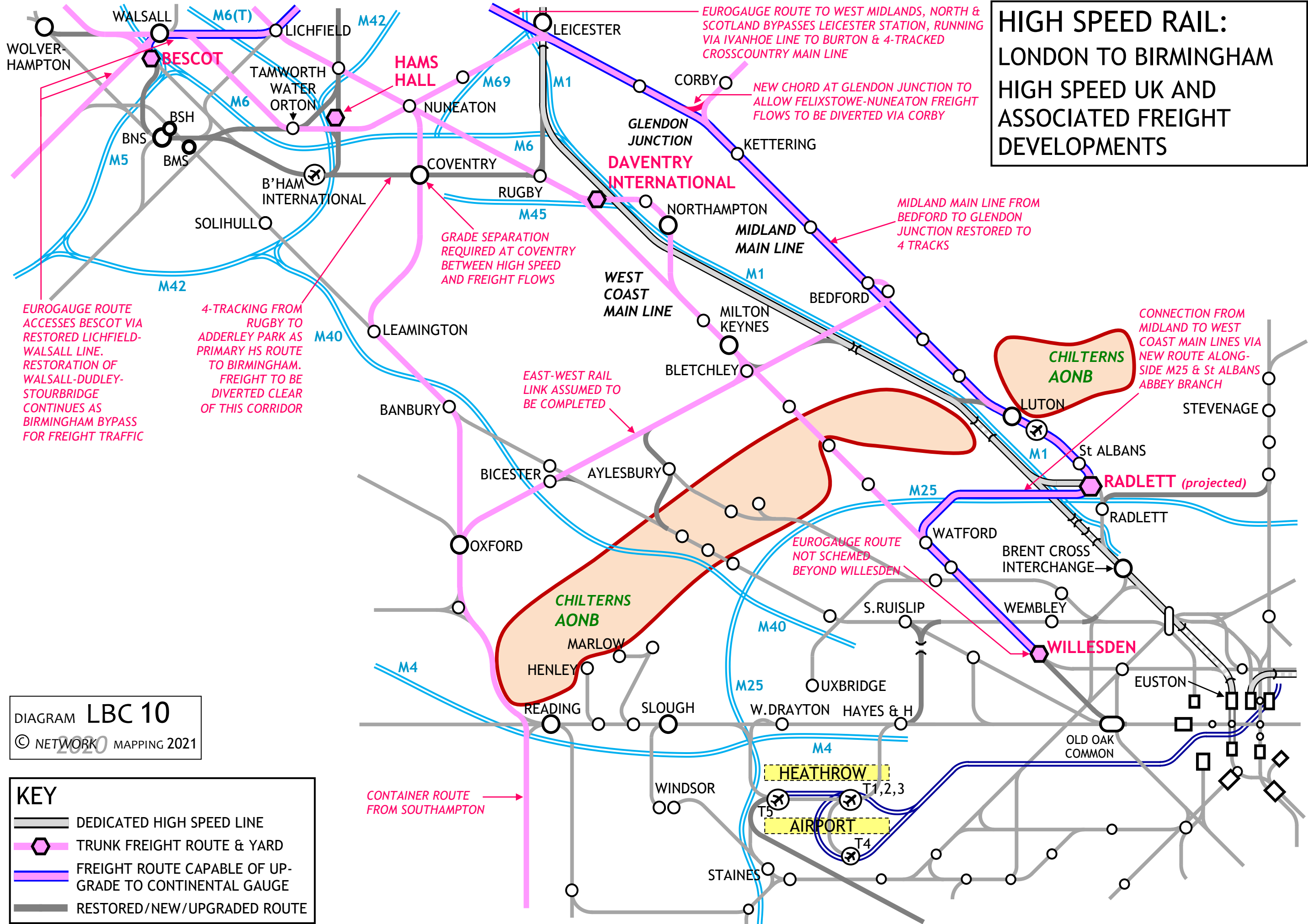
TRANSPENNINE LORRY
SHUTTLE CONNECTING
M60 (BREDBURY) AND M1
(TINSLEY). FOR DETAILS
SEE DIAGRAMS TPW8 & 9

EXISTING FREIGHT FLOWS
THROUGH LEICESTER
DIVERTED VIA CORBY, SEE
HUK EAST MIDLANDS RAIL
STRATEGY DIAGRAM EMN6

LONDON - CHANNEL TUNNEL
EUROGAUGE FREIGHT LINK
STILL TO BE DETERMINED



HIGH SPEED RAIL: LONDON TO BIRMINGHAM HIGH SPEED UK AND ASSOCIATED FREIGHT DEVELOPMENTS



EUROGAUGE ROUTE
ACCESSES BESCOT VIA
RESTORED LICHFIELD-
WALSALL LINE.
RESTORATION OF
WALSALL-DUDLEY-
STOURBRIDGE
CONTINUES AS
BIRMINGHAM BYPASS
FOR FREIGHT TRAFFIC

4-TRACKING FROM
RUGBY TO
ADDERLEY PARK AS
PRIMARY HS ROUTE
TO BIRMINGHAM.
FREIGHT TO BE
DIVERTED CLEAR
OF THIS CORRIDOR

GRADE SEPARATION
REQUIRED AT COVENTRY
BETWEEN HIGH SPEED
AND FREIGHT FLOWS

EAST-WEST RAIL
LINK ASSUMED TO
BE COMPLETED

EUROGAUGE ROUTE TO WEST MIDLANDS, NORTH &
SCOTLAND BYPASSES LEICESTER STATION, RUNNING
VIA IVANHOE LINE TO BURTON & 4-TRACKED
CROSSCOUNTRY MAIN LINE

NEW CHORD AT GLENDON JUNCTION TO
ALLOW FELIXSTOWE-NUNEATON FREIGHT
FLOWS TO BE DIVERTED VIA CORBY

MIDLAND MAIN LINE FROM
BEDFORD TO GLENDON
JUNCTION RESTORED TO
4 TRACKS

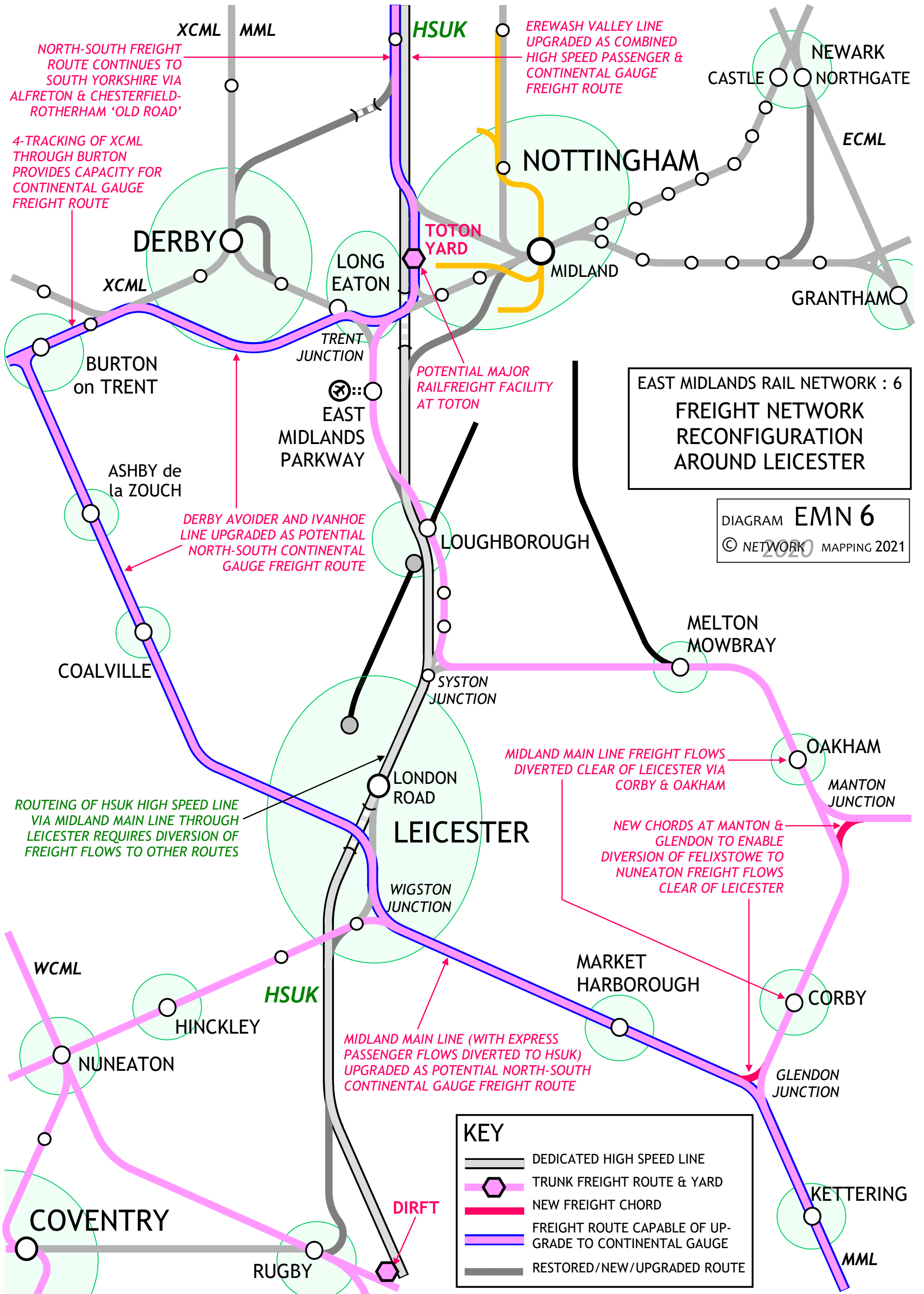
CONNECTION FROM
MIDLAND TO WEST
COAST MAIN LINES VIA
NEW ROUTE ALONG-
SIDE M25 & St ALBANS
ABBEY BRANCH

EUROGAUGE ROUTE
NOT SCHEMED
BEYOND WILLESDEN

CONTAINER ROUTE
FROM SOUTHAMPTON

DIAGRAM **LBC 10**
© NETWORK 2020 MAPPING 2021

KEY	
	DEDICATED HIGH SPEED LINE
	TRUNK FREIGHT ROUTE & YARD
	FREIGHT ROUTE CAPABLE OF UP- GRADE TO CONTINENTAL GAUGE
	RESTORED/NEW/UPGRADED ROUTE



**EAST MIDLANDS RAIL NETWORK : 6
FREIGHT NETWORK
RECONFIGURATION
AROUND LEICESTER**

DIAGRAM **EMN 6**
© NETWORK 2020 MAPPING 2021

NORTH-SOUTH FREIGHT ROUTE CONTINUES TO SOUTH YORKSHIRE VIA ALFRETON & CHESTERFIELD-ROTHERHAM 'OLD ROAD'

4-TRACKING OF XCML THROUGH BURTON PROVIDES CAPACITY FOR CONTINENTAL GAUGE FREIGHT ROUTE

EREWASH VALLEY LINE UPGRADED AS COMBINED HIGH SPEED PASSENGER & CONTINENTAL GAUGE FREIGHT ROUTE

DERBY AVOIDER AND IVANHOE LINE UPGRADED AS POTENTIAL NORTH-SOUTH CONTINENTAL GAUGE FREIGHT ROUTE

ROUTING OF HSUK HIGH SPEED LINE VIA MIDLAND MAIN LINE THROUGH LEICESTER REQUIRES DIVERSION OF FREIGHT FLOWS TO OTHER ROUTES

MIDLAND MAIN LINE (WITH EXPRESS PASSENGER FLOWS DIVERTED TO HSUK) UPGRADED AS POTENTIAL NORTH-SOUTH CONTINENTAL GAUGE FREIGHT ROUTE

MIDLAND MAIN LINE FREIGHT FLOWS DIVERTED CLEAR OF LEICESTER VIA CORBY & OAKHAM

NEW CHORDS AT MANTON & GLENDON TO ENABLE DIVERSION OF FELIXSTOWE TO NUNEATON FREIGHT FLOWS CLEAR OF LEICESTER

KEY	
	DEDICATED HIGH SPEED LINE
	TRUNK FREIGHT ROUTE & YARD
	NEW FREIGHT CHORD
	FREIGHT ROUTE CAPABLE OF UPGRADE TO CONTINENTAL GAUGE
	RESTORED/NEW/UPGRADED ROUTE

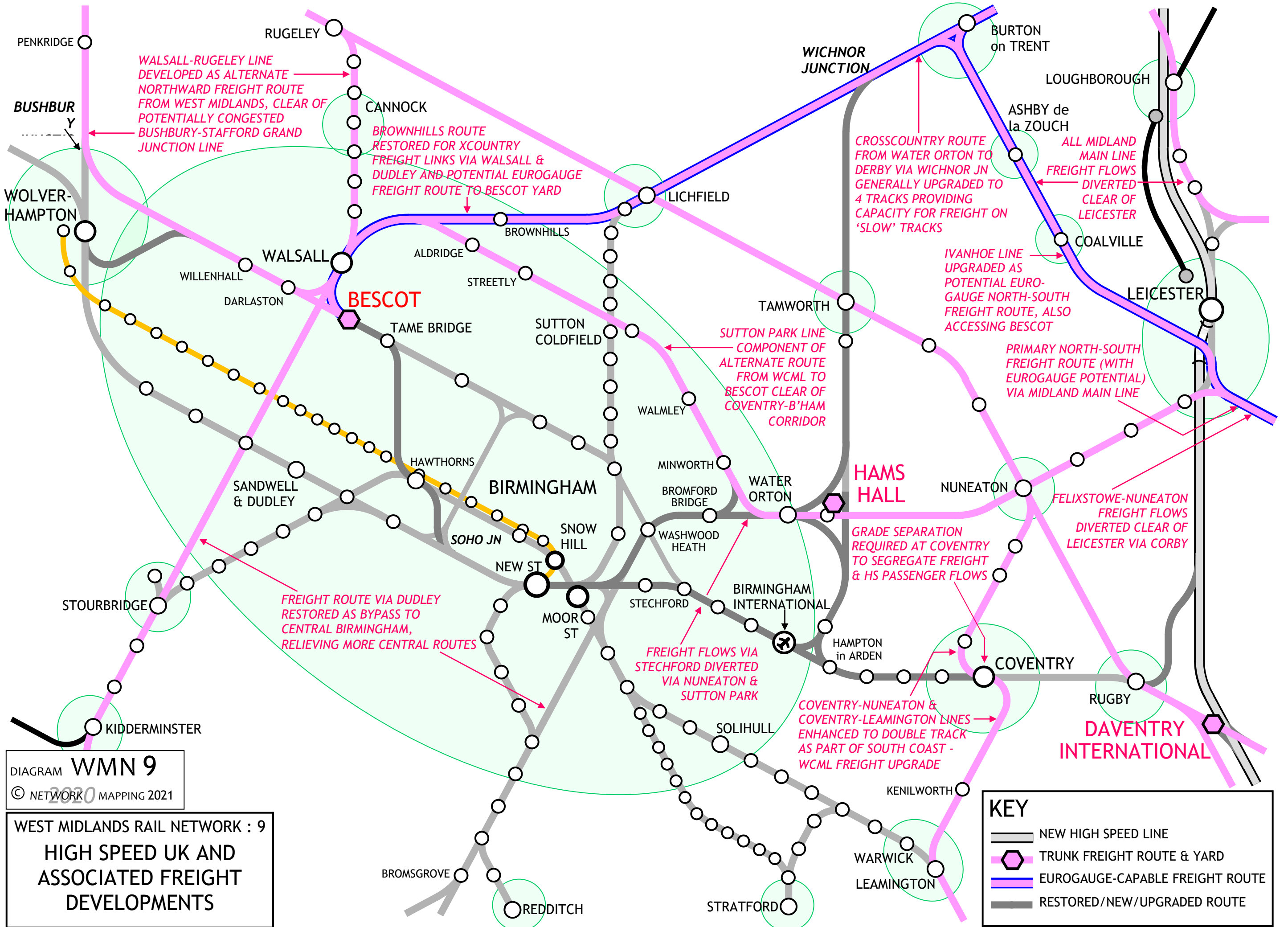






DIAGRAM **WMN 9**
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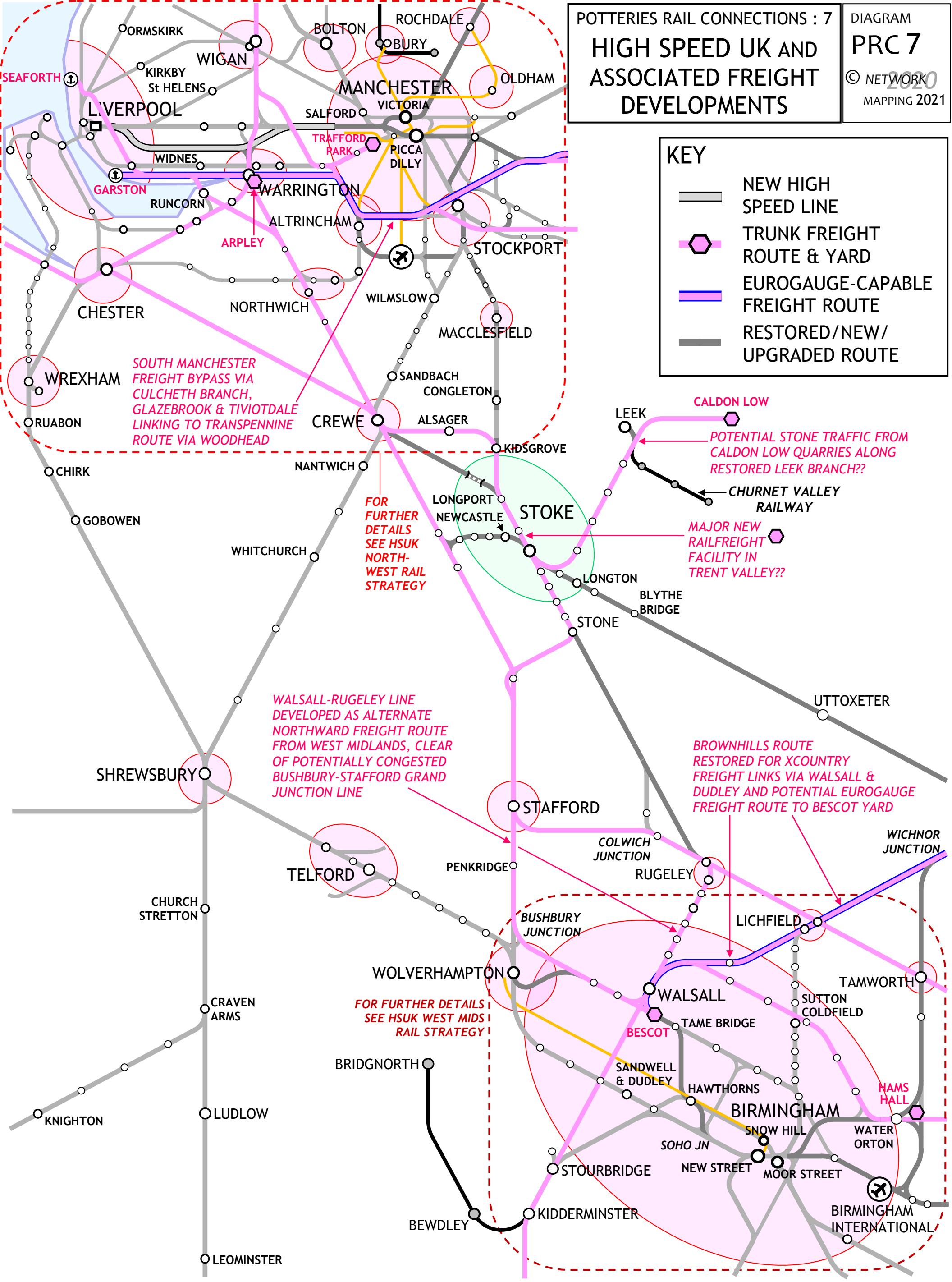
WEST MIDLANDS RAIL NETWORK : 9
HIGH SPEED UK AND ASSOCIATED FREIGHT DEVELOPMENTS

KEY

- NEW HIGH SPEED LINE
- TRUNK FREIGHT ROUTE & YARD
- EUROGAUGE-CAPABLE FREIGHT ROUTE
- RESTORED/NEW/UPGRADED ROUTE

KEY

-  NEW HIGH SPEED LINE
-  TRUNK FREIGHT ROUTE & YARD
-  EUROGAUGE-CAPABLE FREIGHT ROUTE
-  RESTORED/NEW/UPGRADED ROUTE



SOUTH MANCHESTER FREIGHT BYPASS VIA CULCHETH BRANCH, GLAZEBROOK & TIVIOTDALE LINKING TO TRANSPENNINE ROUTE VIA WOODHEAD

FOR FURTHER DETAILS SEE HSUK NORTH-WEST RAIL STRATEGY

WALSALL-RUGELEY LINE DEVELOPED AS ALTERNATE NORTHWARD FREIGHT ROUTE FROM WEST MIDLANDS, CLEAR OF POTENTIALLY CONGESTED BUSHBURY-STAFFORD GRAND JUNCTION LINE

FOR FURTHER DETAILS SEE HSUK WEST MIDS RAIL STRATEGY

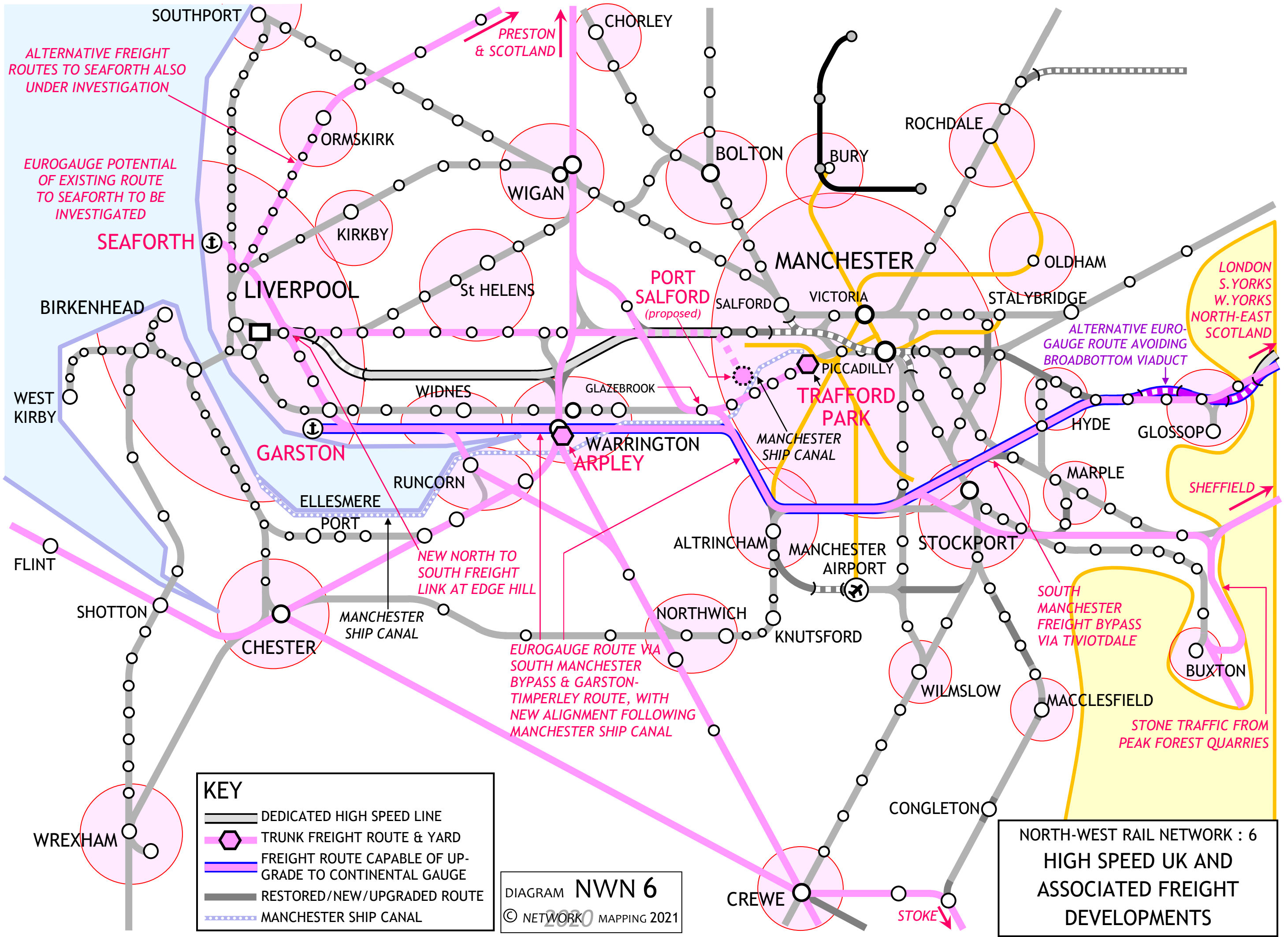
*CALDON LOW
 POTENTIAL STONE TRAFFIC FROM CALDON LOW QUARRIES ALONG RESTORED LEEK BRANCH??
 CHURNET VALLEY RAILWAY*

MAJOR NEW RAILFREIGHT FACILITY IN TRENT VALLEY??

BROWNHILLS ROUTE RESTORED FOR XCOUNTRY FREIGHT LINKS VIA WALSALL & DUDLEY AND POTENTIAL EUROGAUGE FREIGHT ROUTE TO BESCOT YARD

WICHNOR JUNCTION

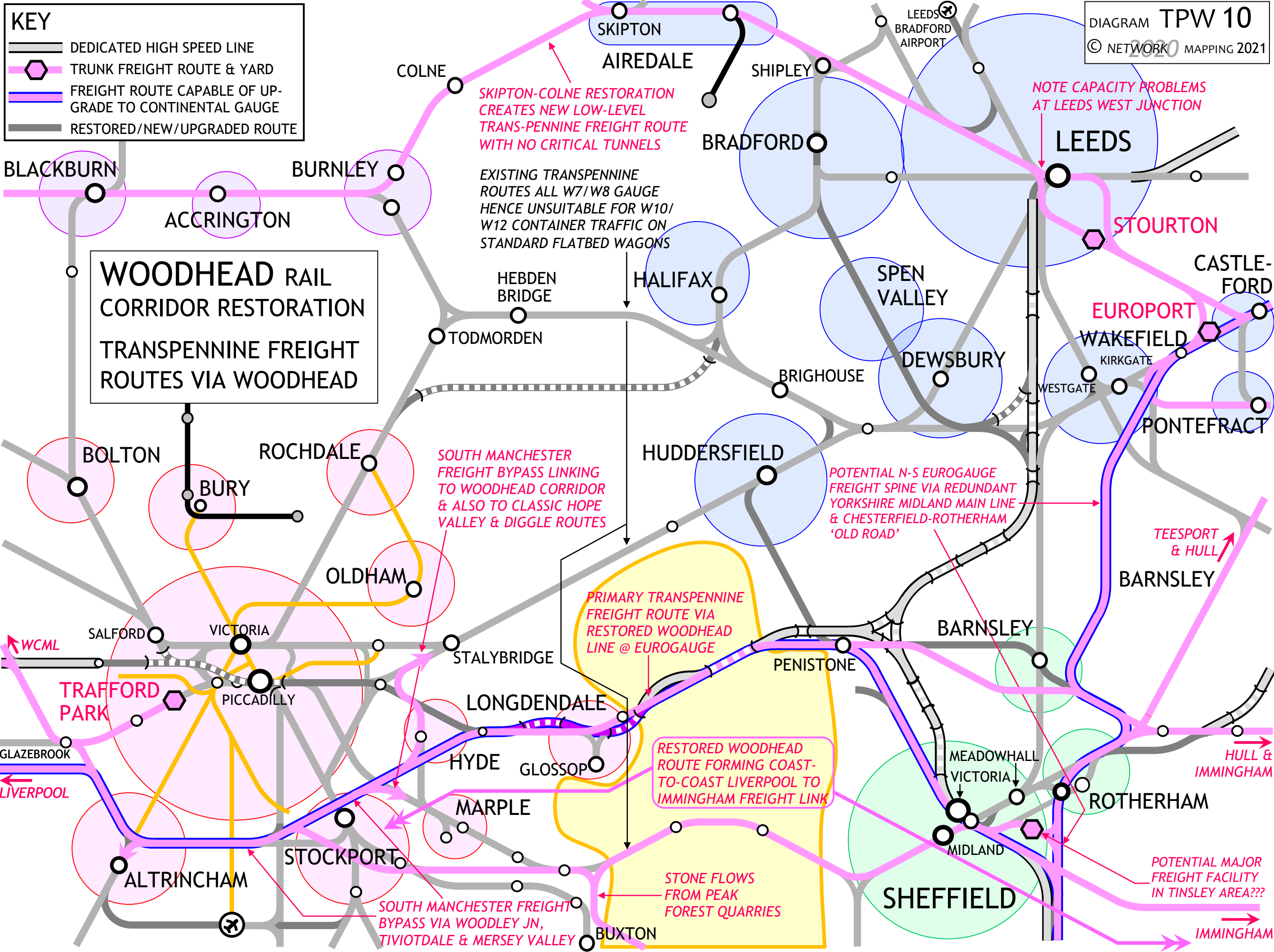
NAMS HALL



KEY

- DEDICATED HIGH SPEED LINE
- TRUNK FREIGHT ROUTE & YARD
- FREIGHT ROUTE CAPABLE OF UP-GRADE TO CONTINENTAL GAUGE
- RESTORED/NEW/UPGRADED ROUTE

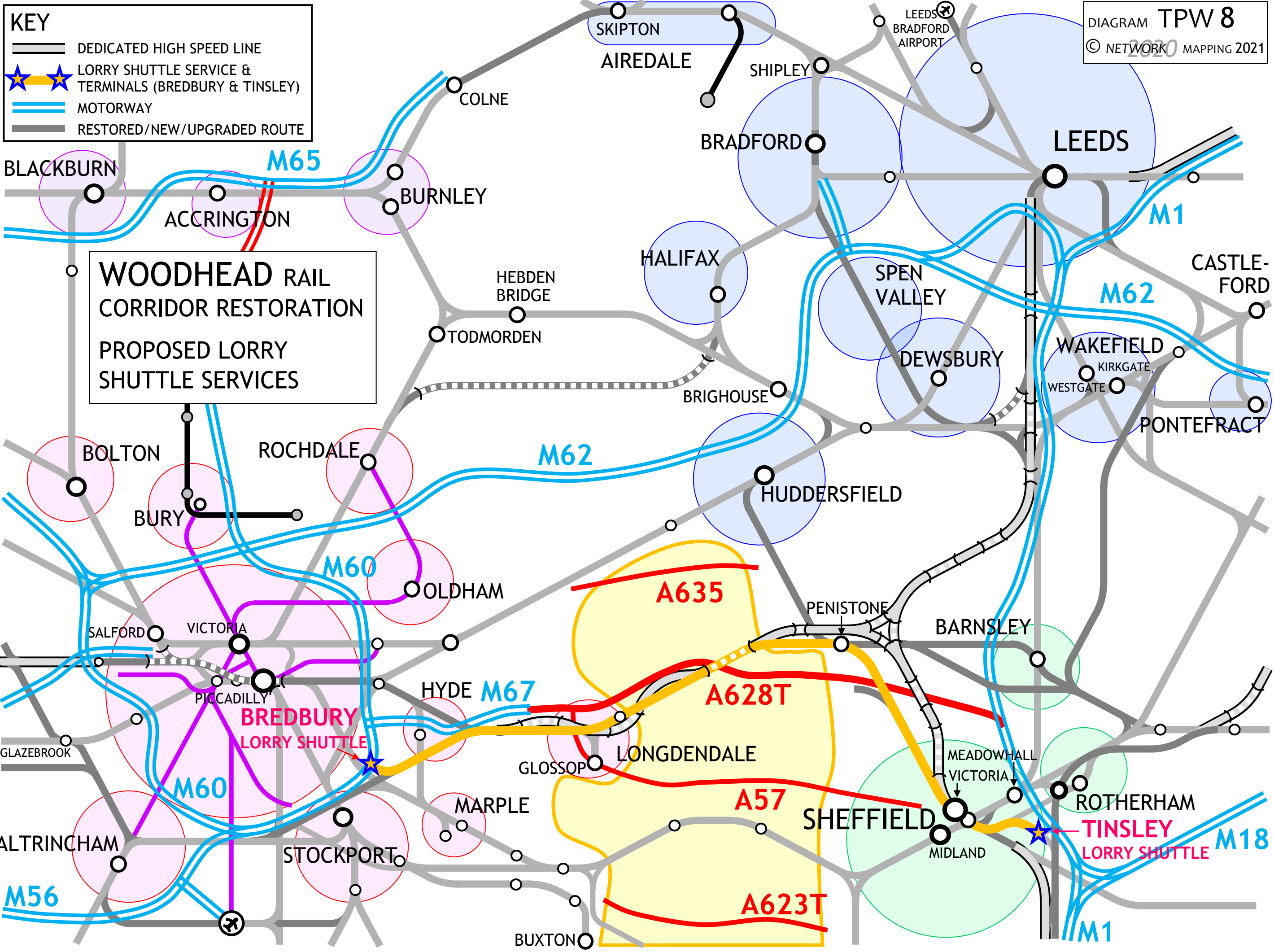
DIAGRAM **TPW 10**
 © NETWORK 2020 MAPPING 2021



KEY

- DEDICATED HIGH SPEED LINE
- ★ LORRY SHUTTLE SERVICE & TERMINALS (BREDBURY & TINSLEY)
- MOTORWAY
- RESTORED/NEW/UPGRADED ROUTE

DIAGRAM **TPW 8**
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WOODHEAD RAIL CORRIDOR RESTORATION
PROPOSED LORRY SHUTTLE SERVICES

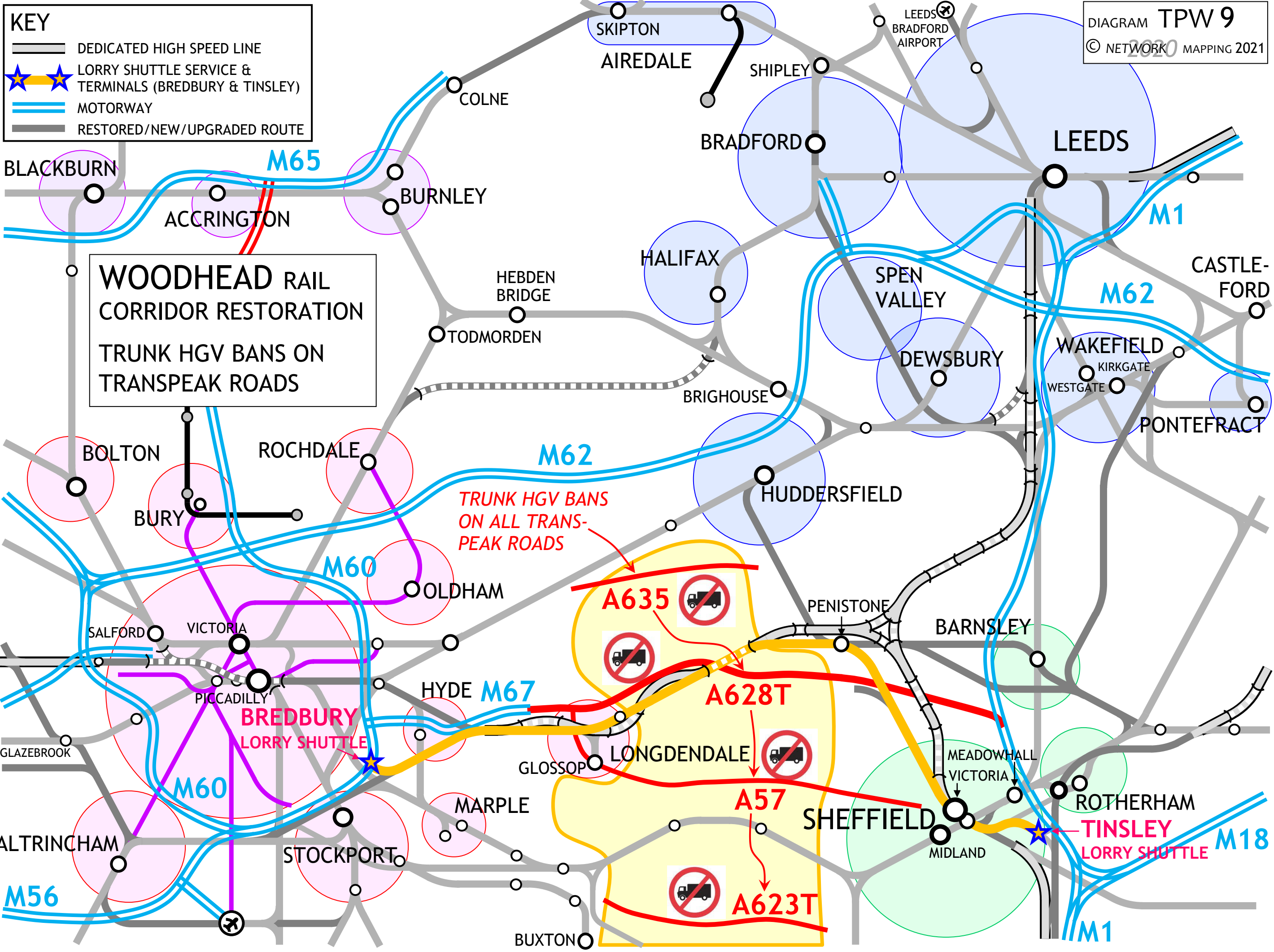
BREDBURY LORRY SHUTTLE

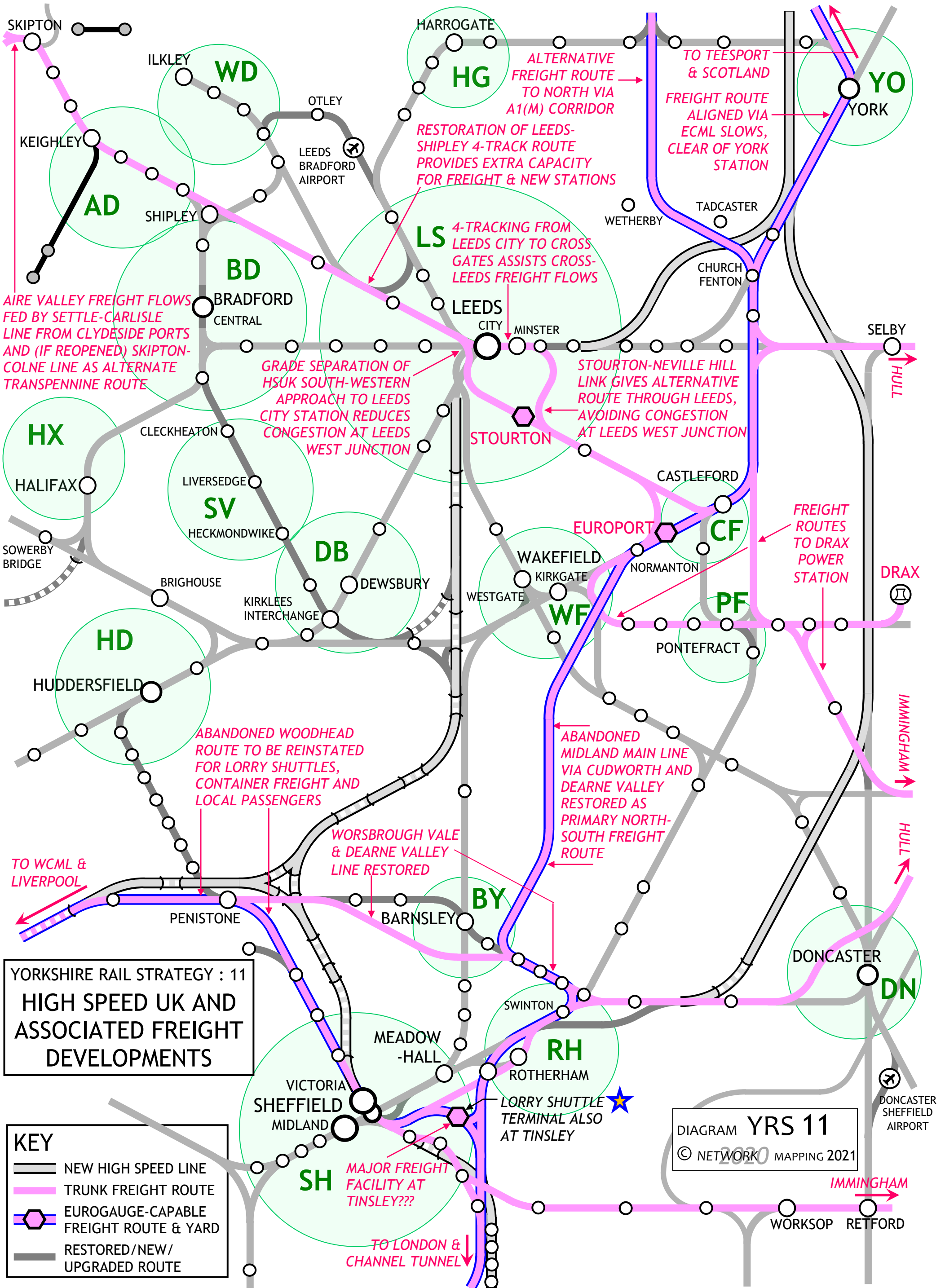
TINSLEY LORRY SHUTTLE

KEY

- DEDICATED HIGH SPEED LINE
- LORRY SHUTTLE SERVICE & TERMINALS (BREDBURY & TINSLEY)
- MOTORWAY
- RESTORED/NEW/UPGRADED ROUTE

DIAGRAM TPW 9
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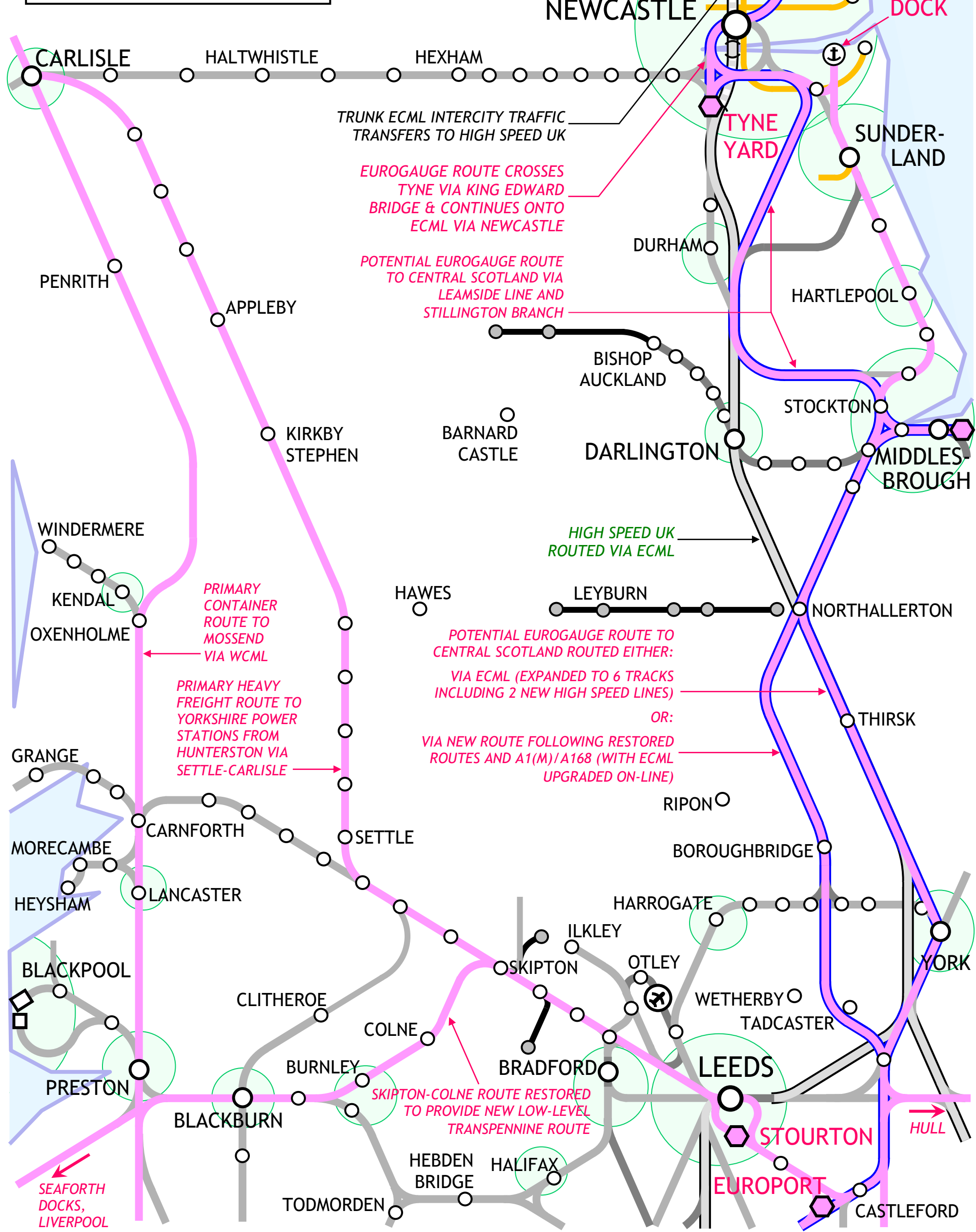


KEY

- DEDICATED HIGH SPEED LINE
- TRUNK FREIGHT ROUTE & YARD
- FREIGHT ROUTE CAPABLE OF UP-GRADE TO CONTINENTAL GAUGE
- GAUGE

NORTH COUNTRY RAIL NETWORK : 7
HIGH SPEED UK AND ASSOCIATED FREIGHT DEVELOPMENTS

DIAGRAM **NCN 7**
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TRUNK ECML INTERCITY TRAFFIC TRANSFERS TO HIGH SPEED UK

EUROGAUGE ROUTE CROSSES TYNE VIA KING EDWARD BRIDGE & CONTINUES ONTO ECML VIA NEWCASTLE

POTENTIAL EUROGAUGE ROUTE TO CENTRAL SCOTLAND VIA LEAMSIDE LINE AND STILLINGTON BRANCH

HIGH SPEED UK ROUTED VIA ECML

POTENTIAL EUROGAUGE ROUTE TO CENTRAL SCOTLAND ROUTED EITHER:
 VIA ECML (EXPANDED TO 6 TRACKS INCLUDING 2 NEW HIGH SPEED LINES)
 OR:
 VIA NEW ROUTE FOLLOWING RESTORED ROUTES AND A1(M)/A168 (WITH ECML UPGRADED ON-LINE)

PRIMARY CONTAINER ROUTE TO MOSSEND VIA WCML

PRIMARY HEAVY FREIGHT ROUTE TO YORKSHIRE POWER STATIONS FROM HUNTERSTON VIA SETTLE-CARLISLE

SKIPTON-COLNE ROUTE RESTORED TO PROVIDE NEW LOW-LEVEL TRANSPENNINE ROUTE

SEAFORTH DOCKS, LIVERPOOL

SCOTTISH RAIL SYSTEM : 9
HIGH SPEED UK AND ASSOCIATED FREIGHT DEVELOPMENTS

DIAGRAM **SRS 9**
 © NETWORK MAPPING 2021

KEY

-  DEDICATED HIGH SPEED LINE
-  KEY FREIGHT ROUTE & YARD
-  FREIGHT ROUTE CAPABLE OF UP-GRADE TO CONTINENTAL GAUGE
-  RESTORED/NEW/UPGRADED ROUTE

