Rail Needs (HS2) Assessment for the Midlands and the North
National Infrastructure Commission Call for Evidence

Submission by the East Midlands HS2 Executive Board

May 2020

Core Messages

- **Deliver in Full:** The Eastern Leg of HS2 is critical to the long term economic success of the East Midlands and UK plc and must be delivered in full. This must include the East Midlands Hub Station at Toton (with provision for city centre HS2 services via a conventional compatible connection), HS2 connectivity for Chesterfield and Sheffield, the Infrastructure Maintenance Depot at Staveley, and a fully upgraded HS2 Station in Leeds.
- **Deliver Early:** There are credible options for the incremental construction of the Eastern leg of HS2 which would deliver wider network and local economic benefits much earlier than would otherwise be the case**.** These options should be developed further in close collaboration with regional and local stakeholders.
- **Invest Now**: Implement a '10 Year Plan' of investment that will improve local transport, support early development of key sites and prepare the way for HS2. This must include the full electrification of the Midland Main Line, removal of the Low Level Rail Line in Long Eaton and delivery of the Phase 1 Package of the East Midlands Gateways Connectivity Study**.**

Summary Response

1. The Eastern Leg of HS2 will run from Birmingham Curzon Street to Leeds, via the East Midlands Hub at Toton, Chesterfield and Sheffield. After Leeds, HS2 trains will be able to continue along the East Coast Main Line to York, Darlington, Durham and Newcastle, with potential to extend up to Edinburgh, the Scottish capital. It will transform connectivity for an area of 13 million people, nearly 6 million jobs and 20% of the UK economy, with key strengths in advanced manufacturing, financial services, construction, biotechnology and higher education.

2. The delivery of the Eastern leg of HS2 is critical to the long term economic prosperity of UK plc and the East Midlands, which is poorly served by the existing rail network. The East Midlands HS2 Growth Strategy sets out proposals to use HS2 connectivity to deliver an additional 74,000 jobs and £4 billion GVA - shifting the Region's long term growth rate from just below to above the UK average.

3. The Hub Station at Toton will drive growth across the region and become a unique destination in its own right. With support from MHCLG and the Midlands Engine, regional partners have submitted a business case to Government to establish an innovative 'locally led urban development corporation' comprising land around the Hub Station and Chetwynd Barracks, East Midlands Airport and the Ratcliffe Power station site. This will further enhance the economic impact of HS2 across the East Midlands.

4. In Chesterfield and Staveley, the prospect of HS2 connectivity and the establishment of an Infrastructure Maintenance Depot is already driving new development and investment that will benefit large areas of northern Derbyshire and Nottinghamshire that have suffered from industrial decline over many years, Early investments include the decision of Spanish train-maker Talgo to locate in the town, and the imminent construction of a multi-million pound office development adjacent to the station.

5. But this economic potential can only be fully realised through integration of HS2 with national, regional and sub-regional transport networks. The decision to integrate the delivery of Phase 2b of HS2 with investment on the conventional rail network is fully supported and consistent with the approach advocated by regional partners since 2013.

6. Treasury (PESA) statistics have consistently shown the East Midlands receiving the lowest level of transport investment per head of any UK region or nation, which in 2017/18 (the latest figures available) stood at just 51% of the UK average. If the East Midlands was funded at the same level as the UK average, the region would have an extra £1 billion a year to spend on transport. 'Levelling up' the UK economy will first of all require a levelling up of infrastructure investment.

7. The Hub Station at Toton will comprise both HS2 and conventional rail platforms and is thus ideally equipped to drive network integration. In addition to new regional conventional rail services, local partners working with Midlands Connect and DfT have developed a strong business case for a conventional compatible junction at the Hub Station which, if configured correctly, would enable conventional compatible HS2 services to run between Bedford, Leicester and Leeds (also supported by TfN) and between Nottingham and Birmingham Curzon Street. These services would require further electrification of the Midland Main Line (MML).

8. Irrespective of the HS2, there is a strong practical, economic and environmental case for electrifying the whole of the MML within this decade – and this remains a shared regional priority. It expected that the line as a far as Market Harborough will be electrified under the current upgrade programme (53% of the MML). The plan to serve Sheffield and Chesterfield via conventional compatible HS2 trains (up to two per hour) will require the line north of Clay Cross to be electrified (62% of the MML). Failure to deliver the complete electrification of the MML over the next decade would represent a huge missed opportunity.

9. Long Eaton already suffers from severance from two existing rail lines. HS2 is likely to increase conventional rail traffic through the Low Level Line and two town centre level crossings. In addition, HS2 itself will require a new 15m high viaduct through the town. However, there is a strong business case for routing all conventional rail traffic through the High Level Line and closing the Low Level alignment in advance of HS2. This could provide the opportunity for the height of HS2 viaduct to be lowered by up to 5m and reduce the number of demolitions.

10. Public transport networks in the East Midlands are generally limited and in need of major investment. With support from Midlands Connect, local partners have developed a prioritised package of multi-modal interventions to link local communities and employment opportunities with the Hub Station. The East Midlands Gateways Connectivity Study 'Phase 1 Package' has a very strong transport business case and will benefit up to half a million local people many of whom live in areas of multiple deprivation, and which could be delivered in advance of HS2 over the next 10 years. There are also emerging proposals to address rail capacity constraints in the Leicester area and to improve local rail connectivity into Chesterfield through the re-opening of the Barrow Hill Line for passenger services.

11. Currently DfT/HS2 Ltd have assumed that no HS2 services will run on the Eastern Leg until the whole line is fully operational. Based in initial work carried out for the East Midlands HS2 Growth Strategy, Midlands Connect has undertaken further analysis on a number of options for incrementally constructing the line, which would allow interim HS2 conventional compatible services to run between London, Birmingham and the Hub Station, with some trains running on to Chesterfield, Sheffield and Leeds. As a result, significant network benefits could be delivered much earlier than might otherwise be the case. This analysis has been shared and discussed with TfN.

12. Even the early delivery of the HS2 Eastern Leg on an incremental basis will not address the current transport deficit in the East Midlands or maintain investor confidence. There is a need to develop a '10 Year Plan' for investment in the East Midlands that will improve local transport connectivity and capacity during the period up to 2030, support early development of key sites and prepare the way for HS2. This plan should include the full electrification of the Midland Main Line, removal of the Low Level Rail Line in Long Eaton and delivery of Phase 1 Package of the East Midlands Gateways Connectivity Study.

1. Introduction

1.1 The East Midlands HS2 Executive Board oversees collective work on HS2 in the region and the delivery of the East Midlands HS2 Growth Strategy on a cross party and cross sector basis. The Executive Board comprises the following member organisations:

- Derby City Council
- Derbyshire County Council
- Leicestershire County Council
- Nottingham City Council
- Nottinghamshire County Council
- Broxtowe Borough Council
- Chesterfield Borough Council
- Erewash Borough Council
- NW Leicestershire District Council
- East Midlands Airport
- East Midlands Chamber of Commerce
- D2N2 LEP
- Leicester & Leicestershire LEP

1.2 The Chair of the Executive Board is Cllr Kay Cutts MBE, the Leader of Nottinghamshire County Council, the Vice Chair is Cllr Simon Spencer, Deputy Leader of Derbyshire County Council. The Executive Board is supported by a number of Delivery Boards:

- Toton Delivery Board: Chaired by Cllr Kay Cutts MBE
- Chesterfield & Staveley Delivery Board: Chaired by Cllr Tricia Gilby
- Skills & Supply Chain Delivery Board: Chaired by Ian Greenaway
- Mitigation Board: Chaired by Cllr Simon Spencer

1.3 This response was agreed by the HS2 Executive Board on the 11th May 2020. It is consistent with wider strategic responses made by Midlands Connect (in particular the proposed 'Package East') and the HS2 East Partnership and supported by submissions made by individual local authorities that are members of the Executive Board.

1.4 It has also been endorsed by the Transport for the East Midlands (TfEM) chaired by the Mayor of Leicester Sir Peter Soulsby, which leads of rail franchise matters and wider strategic priorities for road and rail investment for the East Midlands.

1.5 This response seeks to address the issues highlighted in the NICs call for evidence, but inevitably much the technical detail behind our proposals, such as impact on carbon emissions or economic impacts, sits in the supporting annexes.

2. HS2 Eastern Leg: Bringing the Midlands, the North & Scotland together

2.1 The Eastern Leg of HS2 will run from Birmingham Curzon Street to Leeds, via the East Midlands Hub at Toton, Chesterfield and Sheffield. After Leeds, HS2 trains will be able to continue along the East Coast Main Line to York, Darlington Durham and Newcastle, with potential to extend up to Edinburgh, the Scottish capital.

2.2 HS2 Eastern Leg will transform connectivity for an area of 13 million people, almost 6 million jobs and 20% of the UK economy, with key strengths in advanced manufacturing, financial services, construction, biotechnology and higher education[1].

2.3 The transformative connectivity improvements resulting from HS2 Eastern Leg will help to integrate the local economies of the Midlands, the North and Scotland and provide the basis for a rebalancing of the UK economy away from over-reliance on London and the south east of England – as highlighted by the recent UK2070 Report[2]:

2.4 Independent analysis undertaken for the HS2 East Partnership has indicated that over 60% of the economic benefits of HS2 Phase 2 will arise on the Eastern Leg.[3] De-scoping or delaying the Eastern Leg of HS2 will at best massively reduce the positive impacts of the Government's investment in HS2, and at worst jeopardise the viability of the whole project. It would also seriously undermine local efforts to improve east-west connectivity by conventional rail in both the Midlands and the North through Midlands Engine Rail and Northern Powerhouse Rail.

3. East Midlands Growth Strategy: 'World Class, Locally Led'

3.1 In September 2017, we published our East Midlands HS2 Growth Strategy, setting out proposals to use HS2 connectivity to drive our long term economic growth rate above the UK average equivalent to an additional 74,000 jobs and £4 billion GVA by 2043[4].

3.2 We undertook a comprehensive 'Economic Opportunities Assessment', underpinned by independent analysis from Cambridge Econometrics, to determine the best approach for maximising local growth opportunities - focussing on the D2N2 and Leicester & Leicestershire LEP areas[5]. This combined area already comprises 3.15 million people, over 100,000 businesses and £65 billion of GVA.

3.3 We went back to first principles and looked at the drivers that are likely to shape economic growth over the coming decades. Our analysis suggested that by targeting some of our key sectors that we know can benefit from HS2 connectivity, in particular manufacturing, technology and high value business services, we can massively boost employment growth and help to close the gaps in our economy post Brexit. This approach is consistent with and complementary to the Government's Industrial Strategy and Midlands Engine Strategy.

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[1] The Case for an integrated new rail network serving the the Eastern Leg, Volterra for HS2East, May 2020 available at: http://www.hs2east.co.uk/

[2] UK2020 Final Report: Make No Little Plans, February 2020, available at: http://uk2070.org.uk/wp-content/uploads/2020/02/UK2070-EXEC-SUMMARY-FINAL-REPORT.pdf

[3] HS2 East Economic Benefits, Systra, October 2017, submitted to NIC and available at: https://www.hs2east.co.uk/data/ckeditor/brochure/hs2_east_economic_benefits_study_2017.pdf

[4] East Midlands HS2 Growth Strategy, September 2017, submitted to NIC and available at: https://www.emcouncils.gov.uk/write/East_Midlands_HS2_Growth_Strategy_-_September_2017.pdf

[5] HS2 in the East Midlands Assessment of the Economic Opportunities: Final Report, Ekosgen & Fore Consulting, September 2016, available at: https://www.emcouncils.gov.uk/write/HS2_station_at_Toton_-_an_Assessment_of_the_Economic_Opportunities_Final_Report.pdf

3.4 Whilst the development adjacent to the East Midlands Hub Station will be crucial, our work suggested that a large proportion of the economic benefits of HS2 in the East Midlands will be realised in surrounding localities, in particular:

- **Derby:** a city of world class automotive, rail and aerospace technology sectors. Home to Rolls Royce, Bombardier and Toyota and a thriving network of highly specialised manufacturing SMEs.
- **Leicester:** a vibrant, diverse city with a strong record of SME formation and major growth potential. Home to the National Space Centre and a burgeoning space technology sector.
- **Nottingham:** a city of thriving business services, biotech and leisure sectors with flagship companies like Experian and Boots, underpinned by world class public transport and local energy systems.
- **East Midlands Airport and Freight Interchange:** the biggest freight airport outside of London and home to DHL. The new East Midlands Gateway Freight Interchange includes a direct rail connection opened in 2020 and is already generating thousands of new jobs.
- **Ratcliffe-on-Soar:** The Power Station is due to be decommissioned in 2025 and has site has the potential for re-use as a centre for innovative low carbon development.
- **Loughborough:** a national centre for sport and sports science. The Loughborough University Science and Enterprise Park forms part of a successful Enterprise Zone.
- **Peak District National Park and Derwent Valley Mills World Heritage Site:** the most visited national park in England, adjacent to the cradle of the industrial revolution.
- **Mansfield/Ashfield:** key regional service centres with strengths in manufacturing, logistics and construction.
- **Chesterfield:** an historic and well connected railway town with a strong engineering economy, both a visitor destination and gateway to the Peak District, and with huge latent development potential.

3.5 In addition, there are a range of growth and regeneration opportunities along **the A52 corridor between Derby and Nottingham:** Castle Ward, Pride Park and Raynesway on the Derby side and the Nottingham Enterprise Zones sites - Alliance Boots in Beeston, Beeston Business Park and the Nottingham Science Park.

3.6 The construction of HS2 also has the potential to drive local SME growth in the region in the short term. The East Midlands is the centre of a world class rail sector supply chain focussed around Derby[6] and already over 125 local businesses are benefiting directly from HS2 investment[7].

4. Proposals for a 'Locally Led Urban Development Corporation': Project Alchemy

4.1 The area adjacent to the East Midlands Hub Station at Toton in Nottinghamshire represents a 'once in a lifetime' development opportunity. To capitalise on the location's 'super-connectivity' and unique potential local partners have exciting proposals for a high quality 'Innovation Campus' linked to the region's powerful university sector.

4.2 The development principles underpinning the Innovation Campus have been incorporated into statutory planning policy through the recent review of the Broxtowe Local Plan, and the

[6] http://midlandsenginerail.co.uk/wp-content/uploads/2018/06/Midlands-Engine-Rail-Brochure.pdf
[7] https://www.emcouncils.gov.uk/write/HS2_EAST_MIDLANDS_SINGLES.pdf

relevant parties are now working together on a detailed masterplan to provide a framework for investment.

4.3 The 'Innovation Campus' will sit at the heart of a number of major development opportunities that will include the nearby Chetwynd Barracks 'garden village'; the Ratcliffe-on-Soar Power Station site and the area around East Midlands Airport. Together these sites have the potential to deliver thousands of high quality new jobs and homes.

4.4 Given the collective scale of these opportunities, the Growth Strategy identified the need for a powerful local delivery body to be established. Subsequently, the Government made available funding via the Midlands Engine to explore the establishment of a new form of 'Locally Led Development Corporation', with the objective of accelerating development and maximising growth potential.

1. **Toton & Chetwynd**
A new destination for knowledge-driven jobs and next generation living, with a new HS2 station offering high-speed transport.

2. **Ratcliffe-on-Soar**
A power station ready for redevelopment into a next generation site of industry and innovation.

3. **East Midlands Airport Area**
Home to the UK's largest dedicated air-cargo operation, a global centre for trade and logistics and the entry point to our inland freeport. Plans and infrastructure are in place for immediate delivery.

Figure 1: Development Corporation Priority Areas

4.5 A Summary Business Case[8] has been agreed by the relevant local authority Leaders and LEP Chairs and submitted to the MHCLG Secretary of State in March 2020. It is supported by an emerging proposal led by the D2N2 LEP for an 'Inland Freeport' based around East Midlands Airport.[9]

4.6 The Summary Business Case proposes the creation of an 'Interim Delivery Body' by the end of 2020 to drive forward early site preparation and infrastructure development work, which could then evolve into an exciting new form of Development Corporation once the necessary legislation is put in place by Government.

[8] Summary Business Case, Midlands Engine, March 2020 (submitted to NIC)
[9] Proposal for an Inland Freeport at East Midlands Airport, D2N2 LEP, March 2020 (submitted to NIC)

5. Chesterfield, Staveley and the northern Derbyshire HS2 Growth Zone.

5.1 The prospect of a HS2 connection at Chesterfield Station has led to the establishment by County and Borough councils of a 'Joint Growth Board' which is already driving major regeneration of the town centre and adjacent commercial areas. The potential benefits of HS2 for the Chesterfield area include:

- Better connectivity for the one million people already living within 30 minutes of the station;
- 4,740 new homes and 10,220 new jobs;
- £270m net additional GVA; and 176 ha of brownfield land brought back into use; and
- Establishing an international gateway into the Peak District National Park.

5.2 A comprehensive Chesterfield HS2 station master-plan[10] has been developed to provide a framework for public and private investment which will be given statutory weight through incorporation into the adopted Local Plan in 2020. The D2N2 LEP has already agreed investment of £2.4m towards the development of a new office facility and master planning works within Chesterfield station area. A further £3.8 million has recently been agreed which will support the creation of a new link road from the south of the town to the station and unlock 1.26Ha of new commercial floor-space generating around £95m GVA over a 30 year period.

5.3 A new HS2 Infrastructure Maintenance Depot (IMD) at Staveley will help generate hundreds of new high quality engineering jobs within some of the most deprived communities in England. In the short term, the Depot could also provide a construction base for HS2 to align with the current plans to make the nearby Barrow Hill Roundhouse a rail industry 'centre of excellence' linked to the High Speed Rail College and the research and development capabilities of the Universities of Newcastle and Derby. Spanish train manufacturer Talgo has also chosen to base their UK HQ within the development.

5.4 The prospect of HS2 co-investing in Staveley is already helping to energise landowners to bring forward a 150 hectare brownfield site, with planning applications submitted for a new mixed-use housing and employment zone comprising around 1,500 homes and new leisure and commercial development around a revitalised Chesterfield canal.

5.5 Derbyshire County Council has submitted proposals for a new road known as the 'Chesterfield-Staveley Regeneration Route', which will enable this major development to proceed in parallel with HS2's investment in the IMD. The road scheme is one of just four that have been prioritised by Midlands Connect in July 2019 for 'Large Local Majors' funding from the Department for Transport for the period 2020-25, and received development funding from Government in the March 2020 budget.

6. Trends in Regional Transport Spending

6.1 Treasury Statistics have consistently shown the East Midlands to have the lowest level of transport spending per head of any UK region or nation.

[10] Chesterfield Station Masterplan, Chesterfield Borough Council, 2019
https://www.chesterfield.co.uk/developments/hs2-chesterfield/

Table 1: Identifiable expenditure on Transport
(2013-14 to 2017-18, £ per head, in descending order - excludes inflation[11])

Transport Spending per head					
	2013-14 Outturn £	**2014-15 Outturn £**	**2015-16 Outturn £**	**2016-17 Outturn £**	**2017-18 Outturn £**
London	652	677	859	944	1,019
North West	246	264	382	370	528
UK	319	332	417	435	483
England	297	316	409	425	475
West Midlands	213	251	329	314	412
East	237	256	333	333	402
South East	250	255	329	370	370
North East	213	236	280	291	320
Yorks & Humber	284	279	371	335	315
South West	177	203	263	305	290
East Midlands	**200**	**222**	**255**	**220**	**245**

6.2 Whilst league tables can tell a story, it is the size of the range between the highest and the lowest which is perhaps more relevant.

6.3 The graph below (Figure 2) looks at the position of the East Midlands relative to the UK average spend per head over the last 20 years and compared to the West Midlands and the North West. It shows how transport spending in the East Midlands has declined from around 75% of the UK average at the beginning of the millennium to 50% in 2017/18 (the latest figures available). Whilst spending in the North West and West Midlands has also generally been below the UK average over this period, the situation in these regions has improved markedly since 2015.

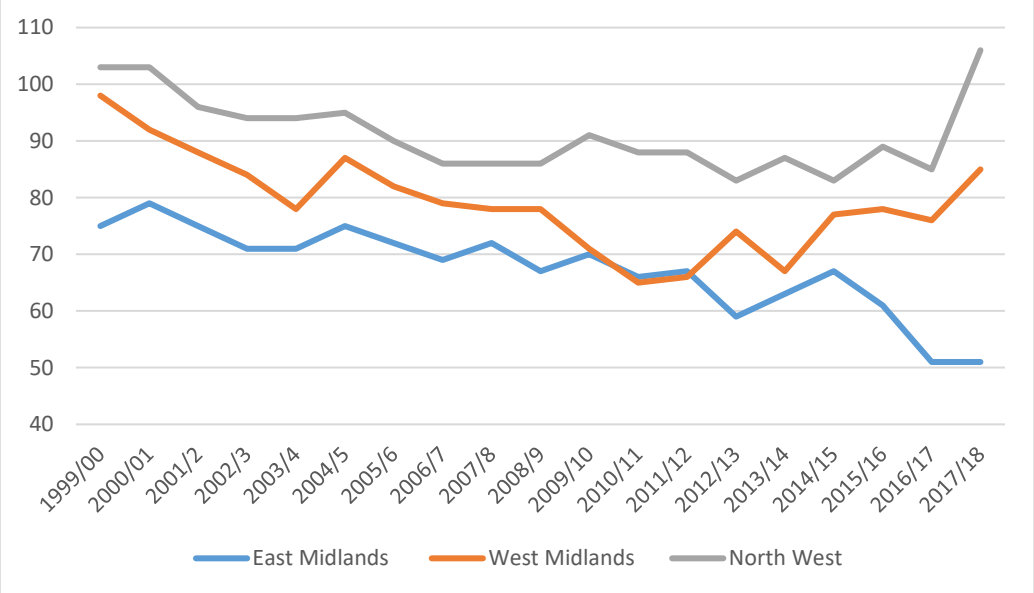

Figure 2: Transport spend per head compared to UK average time series (UK = 100). Source: PESA

[11] PESA Statistics, HMT 2019 https://www.gov.uk/government/statistics/public-expenditure-statistical-analyses-2019

6.4 The analysis suggests that there has been a trend towards rebalancing (or levelling up) transport investment within some regions over recent years - but not in the East Midlands. **If the East Midlands was funded to the same level as the UK average, transport spending in the region would increase by over £1 billion per year.**

7. Rail Services in the East Midlands

7.1 The East Midlands does not have an extensive rail network compared to London or other provincial metropolitan areas like the West Midlands or Greater Manchester.

7.2 Although rail patronage in the East Midlands has shown strong consistent growth over the last 20 years, this has been from a low base. In 2018, 36 million journeys were made by rail in the East Midlands, compared to 94 million in the West Midlands and 134 million in the North West[12]

7.3 The main north-south connectivity to the region's largest urban areas is provided by the Midland Main Line which links Sheffield and London. Although Network Rail are nearing the completion of a major upgrade of the route, it will now only be electrified as far north as Corby and possibly Market Harborough – approximately 53% of the line. Nottingham, the region's largest conurbation and busiest rail station (over 8 million passengers in 2018-19)[13], is served by a spur from the MML. The East Coast Main Line is quicker and cheaper for many journeys to London, Leeds, Newcastle and Scotland, but only directly serves the towns of Grantham, Newark and Retford in the East Midlands.

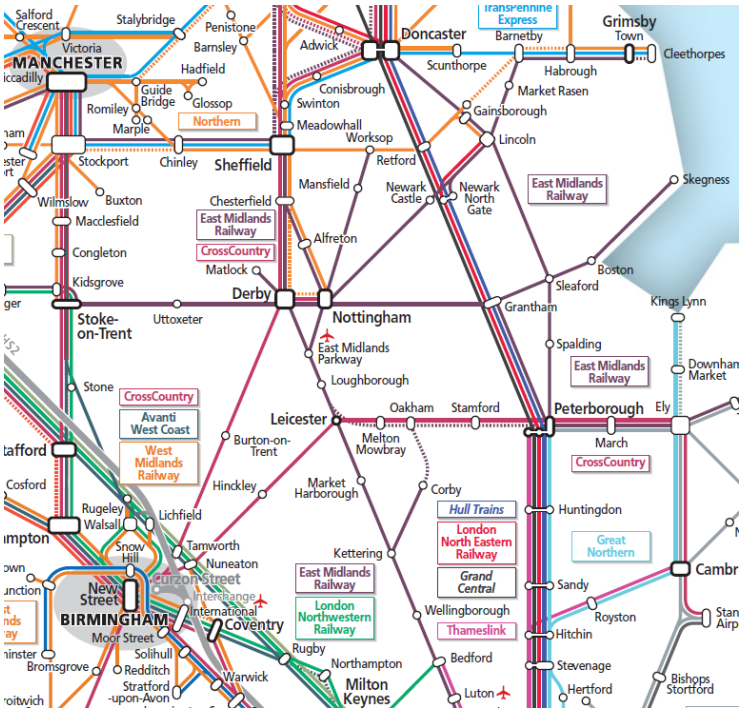

Figure 3: Extract from Train Operator Route Map 2019: https://www.nationalrail.co.uk/stations_destinations/maps.aspx

[12] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/851082/rail-factsheet-2019.pdf

[13] https://dataportal.orr.gov.uk/statistics/usage/estimates-of-station-usage/

7.4 East - west regional services are limited and generally slow, although the new EMR franchise includes commitments to increase service frequencies, particularly in the evenings and on Sundays. There is little in the way of a suburban rail network. The Robin Hood Line between Nottingham, Mansfield and Worksop opened in phases between 1993 and 1998 fulfils this role for north Nottinghamshire and represents the last significant extension of the region's railway. East Midlands Parkway (2009), Corby (2009) and Ilkeston on the Erewash Valley Line (2017) are the only new stations opened during the last 20 years.

7.5 Consequently, rail travel is not an attractive option for many journeys within the East Midlands and across the Midlands and the North. Rail is particularly uncompetitive for journeys between Nottingham and Birmingham, Nottingham and Leeds, Derby and Manchester, and between Leicester and Leeds and Leicester and Coventry (where there is no direct rail service despite the cities being less than 30 miles apart). This lack of connectivity limits labour markets and reduces business efficiency and results in an over-reliance on the private car. In addition, assessments undertaken by Network Rail to inform its long term planning process[14] have concluded that despite recent investment, many of the routes serving the East Midlands will become increasingly overcrowded and congested in the 2020s without the addition of new capacity.

7.6 The Eastern Leg of HS2 will transform connectivity between the East and West Midlands and with Leeds and the North East of England, in a way that simply cannot be achieved by the existing rail network alone, however it is enhanced. The East Midlands Hub Station will less than 20 minutes from Birmingham and just under half an hour from Leeds.

7.7 HS2 will also release capacity from existing lines that will benefit places not served by HS2 trains and ease overcrowding on existing services.[15] For example capacity released on the East Coast Main Line by HS2 would enable Lincoln to London services to be increased to hourly. Network Rail and Midlands Connect are currently developing proposals to increase line speeds between Lincoln and Newark (where Lincoln to London Azuma services join the ECML) from 50pmh to 75pmh, although Lincoln to Nottingham services will remain constrained until the 'flat crossing' at Newark over the ECML is replaced by a grade separated junction.

8. Integrating HS2 into the Conventional Rail Network

8.1 The East Midlands Hub Station at Toton will have both HS2 and conventional rail connectivity and is thus ideally equipped to drive network integration. The current station design incorporates two HS2 platforms and two conventional rail platform in a parallel alignment. The published HS2 specification envisages seven HS2 trains per hour (in both directions) stopping at the Hub Station. The Department for Transport's base case includes

[14] East Midlands Route Study, Network Rail, 2016 https://cdn.networkrail.co.uk/wp-content/uploads/2016/11/East-Midlands-Route-Study.pdf

[15] Midlands Connect HS2 Released Capacity Map, 2019 https://www.midlandsconnect.uk/media/1596/hs2-released-capacity-map-and-table.pdf

provision for conventional rail shuttle services linking the Hub Station with Derby (two per hour), Leicester (two per hour) and Nottingham (three per hour).

8.2 Working with Midlands Connect, local partners have set out plans in the East Midlands Gateways Connectivity Study (see below) to establish a more comprehensive pattern of local services serving the Hub Station comprising:

- A minimum of four direct rail services per hour linking the HS2 East Midlands Hub station to Derby, Nottingham and Leicester stations, as well as Loughborough, Matlock, Mansfield, Newark, Alfreton and Grantham, made possible by the building of a new piece of infrastructure, the Trowell Chord; and

- A new rail service between Mansfield, Derby and Leicester with stops at Ilkeston, Langley Mill, Kirkby, Sutton and HS2 East Midlands Hub utilising part of the Kirkby Freight Line (known as the 'Maid Marion Line').

8.3 In Chesterfield it is envisaged that the HS2 conventional compatible trains serving Sheffield will stop at the existing Chesterfield Station. Currently, just one of the two trains per hour serving Sheffield will also call at Chesterfield. However, there is evidence of strong local economic case for two services per hour and for additional Cross-Country services, which could increase station patronage from just under 2 million to 3 million pa.[16]. This may require some additional infrastructure enhancements, including the provision of a 4th platform[17]. An updated infrastructure assessment is nearing completion and will be submitted by Chesterfield BC. This will confirm the requirement for planned improvements to Dore Junction, three tracks between Dore and Sheffield, and four tracks at the HS2 Spur junction at Clay Cross.[18]

9. Conventional Compatible Services

9.1 The close physical proximity of the HS2 and conventional rail lines at the Hub Station presents the opportunity to extend HS2 connectivity to city centre stations within the East Midlands through the provision of HS2 conventional compatible services.

9.2 Local partners undertook an initial study in 2013 which concluded that provision of a junction at the Hub Station to allow direct city centre connectivity, including direct Leicester-Leeds and Nottingham-Birmingham services, was feasible.[19] Further analysis commissioned by local partners in 2016 concluded that if the Leicester-Leeds service started at Bedford it would have a better business case[20].

9.3 In October 2017, the then Chancellor announced £300m to develop proposals for a number of 'touchpoints' between the conventional rail network and HS2 Phase 2b. The junction at

[16] Chesterfield HS2 Demand Analysis, Aecom for Chesterfield Borough Council 2017 (submitted to NIC)
[17] Chesterfield HS2 Connectivity Capability & Capacity Analysis, Network Rail, 2019)
[18] East Midlands Northern Growth Zone Rail Needs Assessment, SNC Lavalin for Chesterfield Borough Council, May 2020
[19] HS2 Direct Connections Study, Arup for EMC, December 2013 https://www.emcouncils.gov.uk/write/2013-12-20-HS2-Direct-Connections-Study-Outline-Business-Case.pdf
[20] Toton HS2 Classic Connectivity, SLC Rail Ltd for EMC and Leicestershire County Council, August 2016 https://www.emcouncils.gov.uk/write/Item_3,_Appendix_3_-_Draft_Classic_Compatible_Report.pdf

the Hub Station at Toton remains the only such touchpoint under consideration in the Midlands.

9.4 Working closely with HS2 Ltd, Midlands Connect have since undertaken further detailed analysis on demand, junction design and service planning. A revised Strategic Outline Business Case (SOBC) for a junction at the Hub Station was submitted to the Department for Transport in 2019[21]. The SOBC makes the case for two new conventional compatible services, which also form part of the wider 'Midlands Engine Rail Initiative'[22] .

Bedford / Leicester to Leeds

9.5 The value for money case for an additional service between Bedford and Leeds, via Leicester and East Midlands Hub is strong, with a BCR in **excess of 2.0**, including nearly £300m of Wider Economic Benefits. Though the necessary electrification of the MML would reduce the BCR to 1.54, the whole scheme would still represent value for money. This proposed service is also supported by TfN.

Birmingham to Nottingham

9.6 A service between Birmingham and Nottingham via the East Midlands Hub Station is also shown to have a strong case. This service and the Bedford-Leicester-Leeds service have a combined estimated BCR of between **1.44 and 2.03**. However, it would require a re-design of the junction developed initially by HS2 Ltd for the Phase 2b Hybrid Bill – which is now being investigated by HS2 Ltd following instruction from the Department for Transport. A re-design of the junction may also save costs, reduce demolitions and provide more flexibility for future service provision.

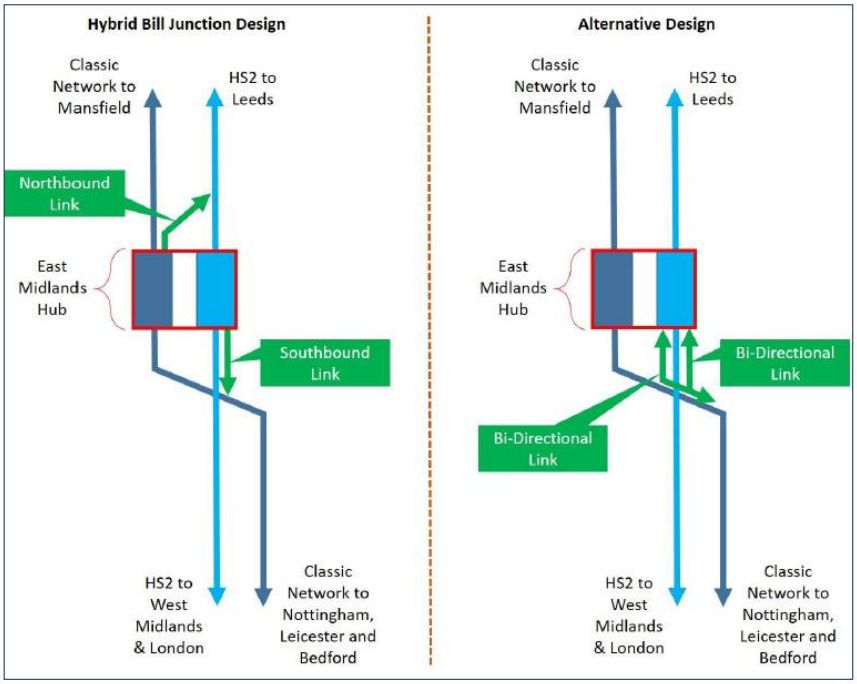

Figure 4: East Midlands HS2 Hub Station: Alternative Junction Designs, Midlands Connect SOBC

[21] Midlands Connect HS2 Classic Compatible Services SOBC, August 2019 (submitted to NIC)
[22] Midlands Engine Rail, Midlands Connect, 2019 (submitted to NIC)
https://www.midlandsconnect.uk/publications/midlands-engine-rail-summary/

10. Completing the Electrification of the Midland Main Line

10.1 Complete electrification of the Midland Main Line (MML) remains a shared priority for the East Midlands. The MML is only currently electrified between London and Bedford – just under 30% of the route to Sheffield.

10.2 The Government is committed to electrification from Bedford to Kettering (Key Output 1) and to ensuring that the whole route between London and Kettering can run at 125 mph (Key Output 1a). This will mean that 47% of the MML will be electrified by 2023.

10.3 The Government cancelled Key Output 2: the electrification of the Midland Main Line between Kettering and Sheffield in 2017 and decided to procure a fleet of diesel/electric bi-mode trains instead. However, in order to electrify as far Corby/Kettering, it will be necessary to connect a power supply located at Market Harborough. There is therefore an opportunity to electrify the section between Market Harborough and Kettering (8.4 miles) rather than running an underground cable. Network Rail is currently developing the full business case to do this – which would increase electrification to 53% of the MML by 2023.

10.4 The Government has already committed to electrifying the MML between Clay Cross in Derbyshire and Sheffield (15.5 miles) to enable HS2 Classic Compatible trains to serve Sheffield by 2033. This will increase electrification to 62% of the MML**.**

10.5 The power supply at Market Harborough will be sufficient to electrify at least to Leicester (a further 16.2 miles). This would increase electrification to 71% of the MML. If at least one platform could be electrified. This would enable re-instatement of the direct Leicester to Bedford peak services lost from the recent revision of the Thameslink timetable.

10.6 Electrifying from Leicester to Nottingham via Toton (24.4 miles) would require an additional power supply but would increase the electrification to over 85% of the MML **-** and also enable the HS2 Classic Compatible services proposed as part of Midlands Engine Rail to operate. Electrifying the remaining 15% between Leicester, Clay Cross and Derby would enable the full network benefits to be realised.

10.7 Analysis of information publicly available in the House of Commons Library suggests that the cost of operating bi-mode trains is around 50% less per mile in electric mode than in diesel mode, due to lower fuel costs and reduced engine/track maintenance costs. As a result, the evidence suggests that if the capital costs can be kept below £3 million per mile (2010 prices), the BCR for incremental electrification of the MML with bi-mode trains would be at least 2 to 1.

10.8 Electrifying just the 'easy' sections of the MML on this basis would significantly reduce the running costs of the line, and may ultimately enable the diesel units to be replaced by battery technology for difficult to electrify sections (such as through stations and tunnels) - eliminating diesel emissions in the Air Quality Management Areas (AQMAs) in Derby, Leicester and Nottingham.

10.9 Fully electrifying the MML would enable bi-mode trains to be converted to all-electric, or to be re-deployed elsewhere on the network and replaced by purpose built electric trains. All electric traction would release a further dividend in running/maintenance costs and based

on experience on the southern section of the MML, make possible additional line speed improvements not viable with the heavier bi-mode trains. The electrification benefits for conventional rail services would be in addition to those which would be realised through the ability to run conventional compatible HS2 services.

10.10 Electrification of the Great Western Line was poorly conceived and subject to substantial cost over-runs due to a combination of poor project management, the scale of the scheme and unfamiliarity with the new technology procured to deliver the works. However the Rail Industry Association (RIA) has set out a series of proposals learning from this experience that should in future enable electrification to be delivered for between 33%-50% of the costs of some recent projects using examples from around the UK and internationally[23].

10.11 In particular, RIA recommends the establishment of a permanent, dedicated electrification team (similar to that which exists in Germany), which could deliver a program of incremental electrification works as opportunities and funding became available. Those currently working on the electrification to Corby, Kettering and Market Harborough could form the basis of this permanent team.

11. Mitigating the Environmental Impacts of the Railway in Long Eaton

11.1 There are two parallel conventional rail corridors running between the Trent Junctions area, west of Nottingham, and the site of East Midlands Hub Station, where interchange will be available in the future between conventional services and HS2 services: the Low and High Level Lines, which both pass through the town of Long Eaton. The Low Level Line has two level crossings within the town, at Main Street and Station Street. There are no level crossings on the High Level Line.

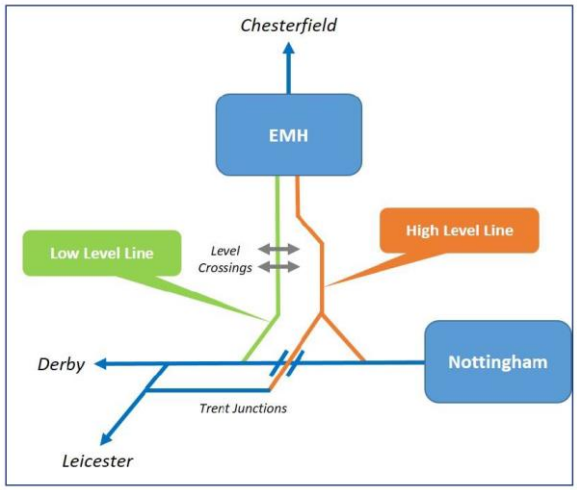

Figure 5: Existing Rail Alignments through Long Eaton

11.2 Usage of the two lines is currently limited to freight services, typically at no more than one train per hour per direction per line. However, the Low Level line causes extreme severance within the town, particularly when the level crossing barriers are down, as well as noise and air pollution.

[23] Electrification Cost Challenge, RIA, 2019 https://www.nsar.co.uk/wp-content/uploads/2019/03/RIAECC.pdf

Figure 6: Low Level Line through Long Eaton

11.3 With the arrival of HS2, the number of services using both lines is forecast to increase considerably. The existing layout at Trent Junctions is complex, and means that without intervention, any future services from Derby to the Hub Station would have to use the Low Level Line. Nottingham services would have to use the High Level Line, while services from Leicester could use either the Low Level or High Level Line. As a result, potentially up to five trains per hour could be passing through the level crossings.

11.4 In addition, the proposed alignment of the HS2 line into the Hub Station requires the construction of a new 15 metre high viaduct through the town. Consequently, Long Eaton is in danger of being bisected by three heavily used railway lines:

11.5 Local partners therefore asked Midlands Connect to investigate a number of options to enable closure of the two level crossings on the Low Level Line, either through closing the level crossings themselves, meaning traffic has to divert, or through closing the Low Level Line, allowing the crossings to be removed[24].

11.6 The preferred option is provision of a new chord onto the High Level Line, which would mean that services from Derby, Leicester and Nottingham could all use the High Level Line to access the Hub Station, rather than being spread across the two routes. This would allow the Low Level Line to be closed, the two level crossings removed and the land redeveloped.

11.7 Closing the low level line also provides an opportunity to realign HS2 in the town, leading to a substantial saving in cost. The HS2 viaduct is currently designed through Long Eaton approximately 15m above ground level in order to clear the A6005 Nottingham Road Bridge over the Low Level Line. If the Low Level Line is closed, the A6005 Nottingham Road Bridge could also be removed, enabling the viaduct to be reduced in height (by around 5m). This would require the additional expense of removing the road bridge, but would still generate a significant reduction to the build costs of the viaduct.

11.8 Similarly, the current HS2 trace is located 15m east of the Low Level Line to avoid a risk to its operation as a railway. Closure of the Low Level Line would allow the trace to be moved at least 15m west, and possibly more as the land released by the Low Level Line could be available as the construction corridor. This would avoid the need to demolish commercial

[24] Long Eaton Low Level Line Study, Jacobs for Midlands Connect, 2019 (submitted to NIC)

and residential property, generating a further cost saving. As a result, closing the Low Level Line is likely to have an overall BCR of between **1.4** and **2.3**.

11.9 A further piece of analysis was undertaken to assess if the High Level Line could accommodate all the anticipated conventional rail traffic. From a high-level review, a 4-minute headway assumption provides sufficient capacity for the Midlands Connect higher service level scenario (including Trowell Chord services) and supports the proposal for a new chord linking to the High-Level line[25].

12. Local Connectivity to maximise the impact of HS2

Access to East Midlands Hub Station

12.1 The East Midlands Gateways Connectivity Study[26] was established to determine the most effective package of interventions to widen access to the Hub Station at Toton in order to boost the regional economic impact of HS2. The study has been jointly funded by the four local transport authorities in the D2N2 area (Derby, Derbyshire, Nottingham, Nottinghamshire), DfT (HS2 Growth Strategy funding), Highways England and Midlands Connect, with an in-kind contributions from HS2 Ltd, East Midlands Airport and Leicestershire County Council.

12.2 The package of recommended interventions is based around three phases: a package of well-defined measures that are operational for when the Hub Station opens ('day 1'), and a package of longer term measures (split into 2 phases), to be deliverable after HS2 opens, which can respond to changing patterns of travel demand and which as a result are generally less well defined at present.

12.3 The Phase 1 package of 'day 1' measures comprise the following interventions, which are in addition to the Government's HS2 Reference Case, Midlands Connect Conventional Compatible services and the proposed Strategic Housing Infrastructure Fund (SHIF) funded access road into Toton site:

- Local NET extensions to Long Eaton (Asda);
- Enhanced local and sub-regional bus strategy;
- Local Road Access from Long Eaton via A6005;
- Part segregated Bus Rapid Transit (BRT) from Derby to the Hub Station;
- Minimum of four conventional trains per hour from the Hub Station to Derby, Leicester & Nottingham via the Hub Station (requiring the proposed Trowell Curve); and
- New rail services between Mansfield and Derby/Leicester via the Hub Station, Ilkeston and Langley Mill (the Maid Marian Line), with enhanced local bus services to both these stations.

12.4 Taken together, the **Phase 1** package of interventions has an estimated capital cost of 454m (2018 costs plus a 66% allowance for 'optimism bias') and an estimated Benefit to Cost Ratio (BCR) of **4.2** – which represents 'very high value for money'. The BCR assessment has been undertaken using appraisal methodology consistent with the Treasury's Green Book, and

[25] Long Eaton High Level Line Capacity, Jacobs for Midlands Connect, 2019 (submitted to NIC)
[26] East Midlands Gateways Connectivity Study Strategic Case & Economic Case, Systra for local partners, 2020 (submitted to NIC). Summary document available at: https://www.emcouncils.gov.uk/write/Access_to_Toton,_the_HS2_East_Midlands_Hub.pdf

therefore only considers 'transport user benefits', with no allowance made at this stage for wider economic benefits such as land value uplift.

12.5 The package of potential longer term measures to be delivered after HS2 is operational is split into two phases:

Phase 2 - which would build on the growth in public transport patronage delivered through Phase 1:

- Conventional rail connectivity to East Midlands Airport/Freight Interchange from the Midland Main Line and East Midlands Parkway Station enabling services linking to Derby and Nottingham;
- Conventional rail connectivity to East Midlands Airport/Freight Interchange from Leicester; and
- Fully segregated mass transit (assumed to be a NET extension for modelling purposes) from Derby to the Hub Station;

Phase 3 - which would also be dependent on significant levels of new development around East Midlands Airport and at Ratcliffe Power Station:

- Conventional rail connectivity to East Midlands Airport/Freight Interchange from Derby via Rolls Royce/Sinfin; and
- Tram-Train connectivity to the East Midlands Airport/Freight interchange from the Hub Station.

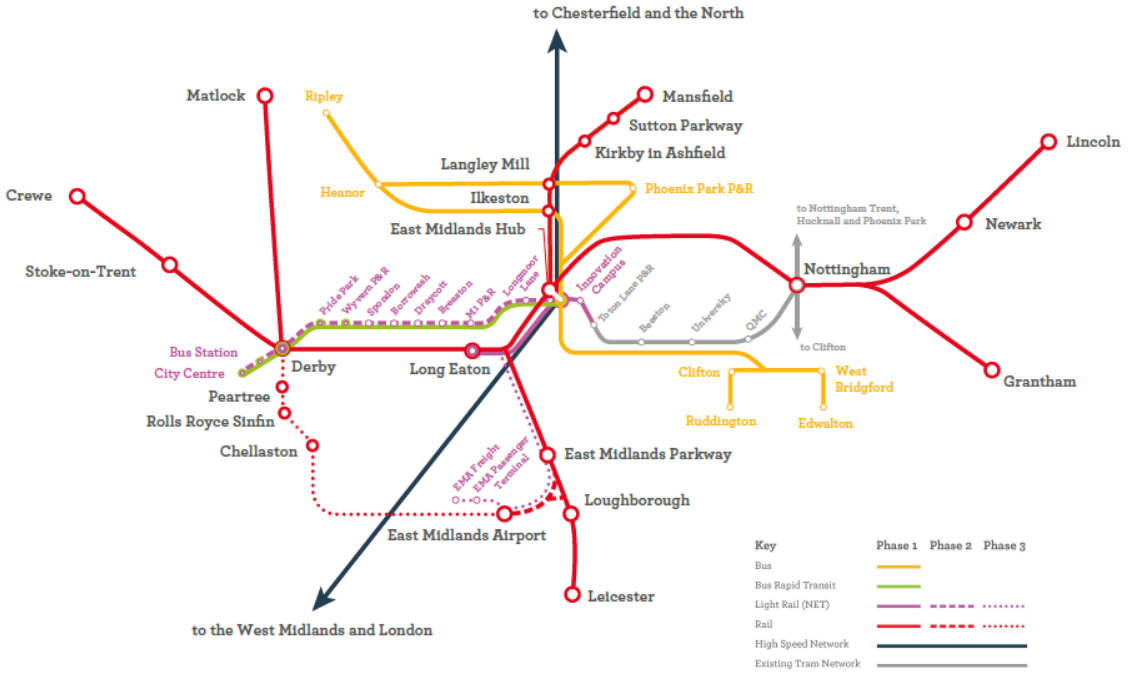

Figure 6: Gateways Study Summary Diagram

12.6 The estimated capital cost of Phase 2a is £822m and for Phase 2b £1,052m (2018 costs plus a 66% allowance for 'optimism bias'). Further work will be required to develop and understand the full benefits of both these packages. At present, the available evidence suggests a combined BCR for the Phase 1, Phase 2a and Phase 2b packages of **1.76** - which still represents 'medium value for money', but which is a significant reduction on the Phase 1 Package alone.

12.7 The impact of the three packages will be to progressively extend the economic impact of HS2 to key centres of population across the East Midlands, in particular to areas of multiple deprivation - as illustrated below.

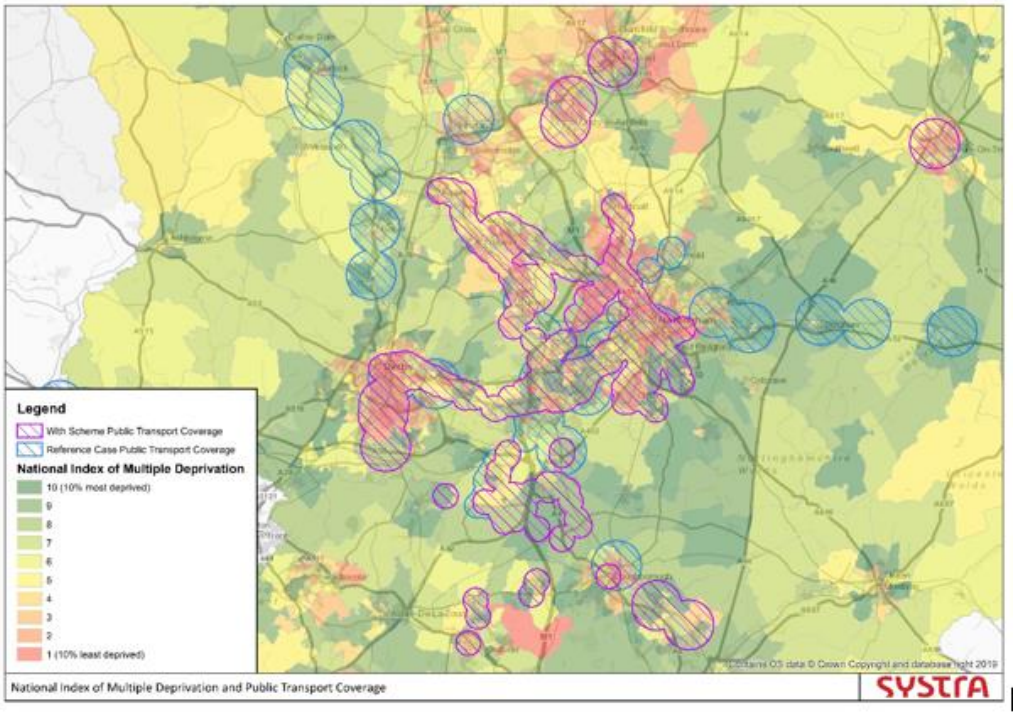

Figure 7: Impact of package interventions on Areas of Multiple Deprivation

Leicester Area Constraints & Opportunities

12.8 Network Rail and Midlands connect have highlighted the potential for future capacity constraints in the Leicester area for both passenger and freight services. As a result Network Rail is leading a study under the Continuous Modular Strategic Planning (CMSP) process. The work is ongoing but is likely to confirm that in order to achieve the train services proposed under the Midlands Rail Hub and HS2, an enhancement scheme between Wigston Junction and the north end of Leicester station will be required. Analysis undertaken for Midlands Connect suggests a direct Nottingham - Leicester – Coventry service would have an estimated **BCR of 2.8.** [27]

12.9 In the short term, there is a major opportunity to improve the functionality and attractiveness of Leicester Station. Leicester City Council, East Midlands Railway and Network Rail have developed a masterplan for the station and the area around it[28]. The masterplan seeks to make the station a high-quality gateway to the City, support regeneration of the area around it, and make it a destination in its own right. The project has a **BCR of 2.7** and a scheme to develop a first phase was the subject of an unsuccessful Transforming Cities Fund bid in late 2019, but remains a priority.

Access to Chesterfield Station

12.10 In addition to making the case for a second HS2 conventional compatible service per hour calling at Chesterfield, Derbyshire County Council and Chesterfield Borough Council are

[27] Midlands Rail Hub SOBC, Midlands Connect, June 2019, available at: https://www.midlandsconnect.uk/media/1571/midlands-rail-hub-summary-report-final-june-2019.pdf

[28] Leicester Rail Station SOBC, Leicester City Council, November 2019

working to improve local connectivity to Chesterfield Station. The Chesterfield master plan includes provision for much improved access by bus, walking and cycling to the station, town centre and regeneration areas.

12.11 Sheffield City Region has also made a successful bid to the Government's 'Restoring your Railway Fund' to reopen the Barrow Hill Line between Chesterfield and Sheffield for local passenger services[29]. This would upgrade the current freight line and re-open local stations in a number of communities in areas of deprivation which currently lack public transport. From an engineering perspective the project looks feasible and it would widen local access to the HS2 network in both Sheffield and Chesterfield. However, demand modelling and economic analysis has yet to be completed.

13 An Incremental Approach to the Delivering the Eastern Leg

13.1 Whilst the Eastern Leg of HS2 must be delivered in full for all the economic benefits to be realised, the East Midlands HS2 Growth Strategy highlighted the potential to at least partially open the Hub Station at Toton in advance of the full completion of the Eastern Leg to Leeds, following the precedent set by Crewe on the Western Leg.

13.2 Since then the Chair of HS2 Ltd's 'stocktake' report and the Oakervee Review have both confirmed that the delivery of HS2, including the Eastern Leg, is likely to be delayed beyond the original times frames set by Government.

13.3 In the light if this, Midlands Connect have undertaken further work on practical options for the incremental delivery of the Eastern Leg in ways which will deliver some outcomes earlier but not require any abortive investment or undermine the completion the line in full[30]. This work has been shared and discussed with officers from Transport for the North (TfN).

13.4 The analysis examined a range of different options and recommended three for further development which have the potential deliver early benefits and should be considered in more detail by the NIC with Midlands Connect, TfN and local partners.

Options 2a

13.5 Construct the railway as far north as East Midlands Hub and operate two trains per hour between London Euston and East Midlands Hub and 2 trains per hour between Birmingham Curzon Street and EMH. This has the potential to deliver substantial journey time reductions for the East Midlands. It requires no incremental classic network infrastructure other than for the associated introduction of classic network shuttles to East Midlands Hub which already form part of the plans of Government and Midlands Connect.

Option 2b

13.6 As option 2a, but with the extension of services over the classic network, with associated electrification, to provide 2 trains per hour between London Euston – Chesterfield/Sheffield and two trains per hour between Birmingham Curzon Street – Nottingham. This delivers further benefits, including a halving of the journey time between these Midlands cities, but also a journey time between London and South Yorkshire 30 minutes faster than today. To achieve this option, some additional infrastructure is required at East Midlands Hub to link

[29] Restoring Your Railway Fund: Sheffield-Chesterfield via Barrow Hill, Sheffield City Region, March 2020

[30] HS2 Phase 2 Eastern Leg Phasing Options Technical Report, Midlands Connect, April 2020 (submitted to NIC)

the HS2 and classic networks together, and 41 miles of infill electrification on the classic network, of which 22 is of required for the full 'Y' network.

Option 4

13.7 Construct the railway as far as Crofton in West Yorkshire and operate two trains per hour between Euston and Leeds (potentially splitting at East Midland Hub for Chesterfield/Sheffield) and two trains per hour between Birmingham Curzon Street and Nottingham. This brings all the benefits of option 2b, but with the addition of fast services between London and Leeds, reducing today's journey time by 35 minutes, and bringing benefits for West Yorkshire in advance of the completion of the complex HS2 works in central Leeds.

13.8 Option 4 secures the widest range of the benefits for the East Midlands short of completing the whole line, but in theory all three options could be delivered in sequence – and in parallel with work to complete the full scheme.

13.9 In terms of timescales for these options, the Government's revised Full Business Case for HS2 Phase 1 published in April 2020[31] suggests that HS2 services will not be able to access Euston until 2031. This therefore represents the earliest date at which the first interim HS2 services could start running to the East Midlands Hub Station.

14. An Initial 10 Year Investment Plan for the East Midlands

14.1 Enabling some interim HS2 services to reach the East Midlands Hub Station by 2031 would represent a significant improvement on the current expected timescales for the full delivery of HS2 Phase 2b and the Eastern Leg in particular.

14.2 However, even this timescale is unlikely to give sufficient comfort to businesses or investors, nor start to address the current transport deficit in the East Midlands. There is an opportunity to focus on measures that can delivered over the next 10 years which will have local economic and community benefits, and which will also prepare the way for HS2.

14.3 The technical work undertaken to date provides a strong evidential basis for such an approach. As a result, an East Midlands 10 Year Investment Plan (2020-2030) should include the following:

- Complete electrification of the Midland Main Line.
- Closure of the Low Level Line in Long Eaton and removal of the two level crossings; and
- The delivery of the Phase 1 package of the East Midlands Gateways Connectivity Study, including the 'Maid Marian Line' and the Trowell Chord;

14.4 These investments would support the work of 'Project Alchemy' and help to secure the initial phases of development in all three priority areas and boost the East Midlands rail sector supply chain. They would also help to close the region's transport funding gap with the UK average in advance of the delivery of HS2 Phase 2b.

[31]Full Business Case, High Speed two Phase 1, Department for Transport, April 2020 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/879445/full-business-case-hs2-phase-one.pdf