

**A Prospectus for a  
Better Deal for  
South Yorkshire  
from HS2 and NPR**

**Sheffield  
City Region**

## FOREWORD



Poor rail connections limit the flow of people, ideas and businesses both within our City Region and between other parts of the north of England. We need a clear plan of action, one that draws together planned national, pan-regional projects such as HS2 and Northern Powerhouse Rail (NPR) and local investment in community rail stations and transport interchanges to ensure we build a transport system that is fit for the 21st century.

We welcome the fact that the National Infrastructure Commission (NIC), on behalf of the Government, is preparing an Integrated Rail Plan for the Midlands and the North (IRPMN), aimed at better integration of planned major investment in HS2 and NPR, and aligning them more closely with local proposals.

We also welcome the opportunity to influence the IRPMN and set out clearly how we see it shaping the development of the rail network serving Sheffield City Region over the next 20 years. Our City Region sits on the boundary between the North and the Midlands and also at a key juncture between HS2 and NPR. We therefore want to ensure we secure a more integrated approach to the design and delivery of these two major rail projects as well as services linking the North and Midlands. We believe the IRPMN provides a real opportunity to accelerate aspects of HS2 and NPR and to deliver them in a more joined up way as part of an improved rail network for our City Region. At present, there is very little in the HS2 scheme that provides direct benefit for the SCR – this is an anomaly that the IRPMN has the chance to address.

I am therefore pleased to present this Prospectus setting out the Sheffield City Region Mayoral Combined Authority's priorities and a suggested integrated delivery programme for inclusion within the IRPMN. The document builds on our own Integrated Rail Plan and our response to the NIC's Rail Needs Assessment that we submitted in May 2020.

Of course, we need a firm commitment from the Government to the HS2 Phase 2b eastern leg and NPR, building on the recent funding commitment to the TransPennine Route Upgrade. This should be complemented by much needed shorter term upgrades to the rail network such as the Hope Valley Line capacity scheme and capacity improvements around Sheffield Midland station. This investment is vital to support the economic recovery from the COVID-19 pandemic and the 'levelling up' of the North, providing certainty to the market and supporting rail jobs and supply chains.

In particular, we are calling for early delivery of aspects of both HS2 and NPR programmes on the Sheffield spur and 'northern loop', including early electrification of the full Midland Mainline from Market Harborough to Sheffield and then north towards Doncaster and Leeds. This should be coupled with the line speed and capacity upgrades required to enable HS2 and NPR trains to run alongside local and regional trains. As part of this we would expect to see early delivery of the tram-train extension to Doncaster to enable the additional NPR/HS2 services on the corridor, and the construction of the new stations at Barnsley Dearne Valley and Rotherham. Completion of this package of improvements would deliver a HS2 and NPR-ready section of the network within the next 10 years.

We have been working closely with TfN, Network Rail and our neighbouring regions in the North and Midlands to set out this programme of interventions, one that secures the optimum future rail services across our areas and beyond. It is vital that Sheffield City Region is not 'left behind' by investment focussed on other regions and lines, and that it is front and centre of the IRPMN. The IRPMN should also address the needs of our whole City Region including areas served by the East Coast Main Line as well as the Midland Mainline and those that may not get any direct benefit from HS2 and NPR but may suffer adversely from the HS2 main line going through them.

I look forward to continued engagement on the IRPMN and to seeing some early wins announced soon.

**Mayor Dan Jarvis MBE MP.**

## INTRODUCTION

The National Infrastructure Commission (NIC), on behalf of the Government, is preparing an Integrated Rail Plan for the Midlands and the North (IRPMN), aimed at better integration of planned major investment in HS2 and Northern Powerhouse Rail (NPR) and aligning them more closely with each other and with local proposals. The Sheffield City Region Mayoral Combined Authority (SCR MCA) is seeking a Better Deal for South Yorkshire from HS2 and NPR through this process, and this Prospectus outlines a series of 'asks' from SCR designed to inform the final IRPMN.

Given the city-to-city connectivity provided by both HS2 and NPR, this Prospectus concentrates on what SCR wishes to see in terms of connectivity with some of its closest city region pairs, notably Leeds and Manchester, but also the East and West Midlands, the North East and Scotland, as well as burgeoning economic connections elsewhere across the UK. However, the Prospectus also recognises the key role that rail will play in connecting people within SCR, particularly our urban centres and identified growth zones, and so includes a number of local rail interventions that show how the IRPMN fits with the SCR Integrated Rail Plan (SCR IRP), contributing to a single integrated rail plan for the North.

Finally, the Prospectus outlines how an integrated, sequenced approach to programming rail service and infrastructure improvements to the SCR rail network and services can deliver greater benefits more quickly and support wider plans for economic development, jobs and skills. These improvements will go further and faster on decarbonisation than is currently planned, may de-risk some elements of the current HS2 proposals, and provide Government with a means of starting to deliver the NPR network within the next five years. They also show how the SCR's own ambitious agenda for transport will complement national investment, improving access to jobs, opportunities and services right across South Yorkshire, thereby securing a Better Deal for all partners.

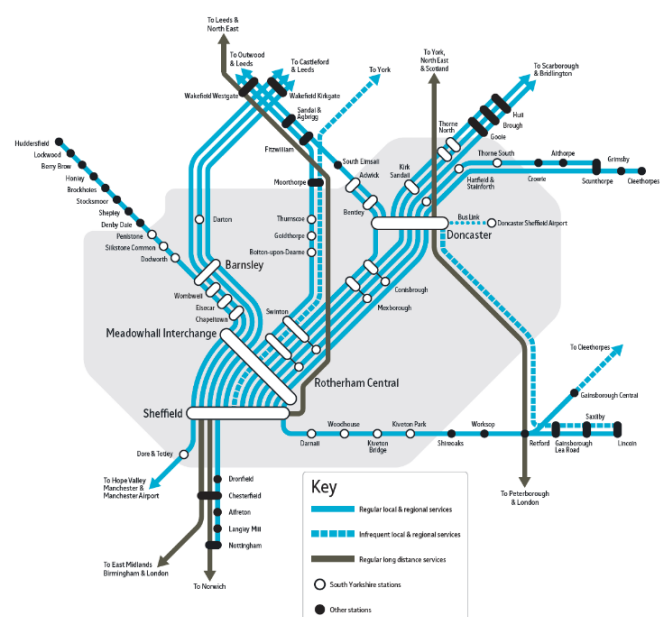
## SCR'S RAIL NETWORK TODAY

### OVERVIEW

The diagram opposite shows the existing rail network in the SCR and the key links to surrounding areas.

The East Coast Main Line (ECML) is the principal north-south rail line in the east of the SCR, linking Doncaster and Retford to London, West Yorkshire, the North East and Scotland. Doncaster is an important national railway hub on the ECML that provides links to a wide range of destinations and interchange between services. Doncaster is therefore a major transport hub for the SCR.

The Midland Mainline (MML) is the key rail link between the central and western parts of the SCR, principally Sheffield, to London and the East and West Midlands. Barnsley and Rotherham are not directly served by intercity connections at present, requiring interchange in either case at either Sheffield or Doncaster for most long distance services.



There is no direct rail connection between Barnsley and Doncaster or between Barnsley and Rotherham, that restricts access to the national rail network and travel choices within Barnsley and the Dearne Valley.

The SCR freight network supports our nationally important industries distributing goods and materials from the City Region to destinations across the UK and for exports through connections to the Humber ports. The current situation of a mixed-traffic railway across much of the North, where freight and passenger trains largely use the same lines impacts on performance and limits opportunities for more freight on rail. The two-track network with multiple flat junctions and limited passing opportunities is the single greatest connectivity constraint for rail services within, to and from SCR. There is a wide disparity in train speeds which limits available network capacity. Addressing this through providing separate infrastructure for the fastest trains reduces the gap between fastest and slowest trains which is expected to result in a release of capacity and improved capability on the existing network.

## SHEFFIELD TO LEEDS CORRIDOR

Just 30 miles apart, the cities of Sheffield and Leeds, along with their surrounding city regions, are integral parts of the future advanced manufacturing and industrial spine of the UK and have a combined population of around 1.4 million people, with almost 5 million people living in the two wider city regions. Despite their proximity, the current rail journey between the two city centres takes at least 40 minutes for the fastest trains – however, this service is generally only hourly, and is often unreliable and crowded.

The table opposite shows the current pattern of rail services provided between Leeds and Sheffield, and the mix of fast, semi-fast and stopping services that link the two cities, whilst also serving key intermediate centres of Barnsley and Rotherham.

The hourly ‘fast’ services are currently provided under the CrossCountry franchise, continuing to Derby, Birmingham and the South West beyond Sheffield to the south and to the North East and Scotland beyond Leeds. An additional CrossCountry service each hour is also routed via Doncaster.

Origin	Destination	Service Information	Daytime Frequency (trains per hour)	Journey Time (minutes)
Sheffield	Leeds	<i>Fast service</i>	1	39 – 42
		<i>Semi-fast</i>	2	55 – 60
		<i>Stopping service</i>	2	70 – 87
Barnsley	Sheffield	<i>Semi-fast</i>	2	22
		<i>Stopping service</i>	2	26 – 30
	Leeds	<i>Fast service</i>	2	35
		<i>Stopping service</i>	1	55
Rotherham	Sheffield	<i>via Meadowhall</i>	3	15
	Leeds	<i>Stopping service</i>	1	62

The ‘semi-fast’ services are currently provided by Northern Trains through directly operated railway arrangements and continue beyond Sheffield to Nottingham and Lincoln respectively. The stopping services are also provided by Northern Trains and do not continue beyond Sheffield or Leeds.

Aside from the ECML from Retford, through Doncaster to Wakefield/Leeds and north towards York, most of the network on this corridor is unelectrified at present. Much of the network is also a two-track railway with at-grade junctions, some of which, notably those between Sheffield and Swinton, are identified as critical capacity constraints by Network Rail in their Continuous Modular Strategic Planning (CMSP) work for the Sheffield area.

The capacity of platforms and the approaches at both Sheffield Midland and Leeds stations have also been identified as significant constraints on future growth, not just for the SCR but also more widely for rail services in the North and Midlands.

## SHEFFIELD TO MANCHESTER CORRIDOR

The cities of Sheffield and Manchester also have some of the poorest transport connections between major city pairs in the UK with both road and rail connections being slow and having capacity constraints, as well as being particularly susceptible to adverse weather. The current rail journey between the two city centres via the Hope Valley Line takes just over 50 minutes at best. Trains are crowded and the customer experience is poor, and this is not helped by relatively old rolling stock and a fragmented service offer. Also, the limited available train paths in this corridor have to be shared between passenger services and significant freight demand serving a number of the Peak District quarries.

The table opposite shows the current pattern of rail services provided between Sheffield and Manchester, and the mix of fast and stopping services that link the two cities – the ‘fast’ services approach Manchester via Stockport whilst the stopping services are routed via Marple.

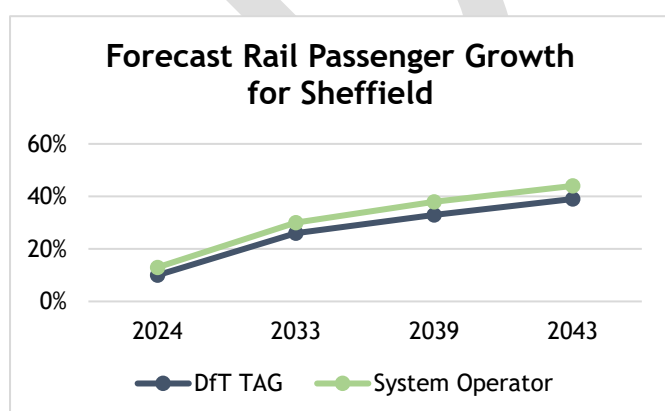
Origin	Destination	Service Information	Daytime Frequency (trains per hour)	Journey Time (minutes)
Sheffield	Manchester	<i>Fast service</i>	2	51 – 54
		<i>Stopping service</i>	1	68 – 78

The two hourly ‘fast’ services are provided by the TransPennine Express franchise, from Manchester Airport/Piccadilly and continuing to Doncaster, Scunthorpe and Cleethorpes, and the East Midlands Railway franchise, as part of the service between Liverpool Lime Street and Nottingham. Stopping services are provided by Northern Trains through directly operated railway arrangements, serving intermediate stations on a generally hourly service pattern and do not continue beyond Sheffield or Manchester.

Freight operations through the Hope Valley are extensive and complex and the desire to reduce heavy goods vehicle traffic through the Peak District National Park means that this is likely to continue. One of the corridor’s challenges is how to combine the strategic needs of longer distance passenger and freight services with those of the stopping services, providing important local connectivity and access for tourism.

The line is unelectrified and is predominantly a two-track railway with at-grade junctions. The capacity of platforms and the approaches to both Sheffield Midland and Manchester Piccadilly stations, particularly the through platforms 13 and 14 at Manchester Piccadilly and the Castlefield rail corridor, have been identified as significant constraints both today and for future rail growth, again not just for the SCR but also more widely for rail services in the North and Midlands.

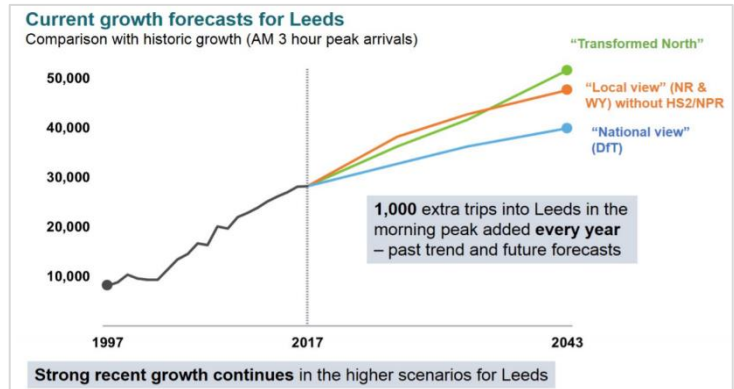
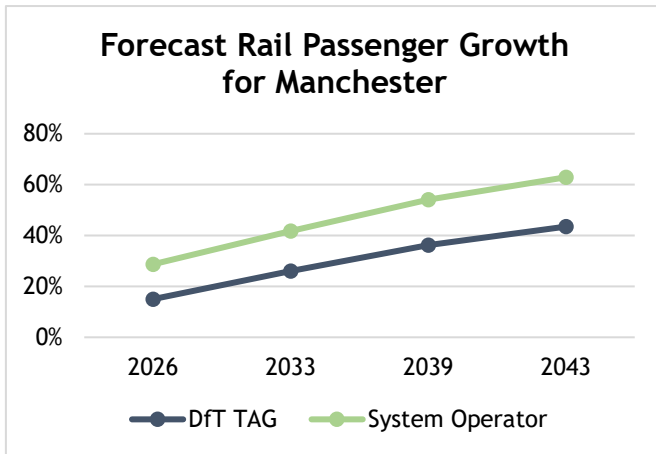
## PASSENGER DEMAND



The graphs opposite and overleaf show recent and forecast levels of growth in rail use for all services using Sheffield, Leeds and Manchester. Growth in the Yorkshire and the Humber region in particular has been stronger than elsewhere in the UK – for example, whilst the number of rail passenger journeys in 2017/18 in the UK had more than doubled since 1995/96, during the same period, rail trips in Yorkshire and the Humber almost tripled to 73.8 million journeys in 2017/18.

Source: Network Rail “CMSP: Sheffield Demand Analysis Note” (Base Year 2016)





Source: Transport for the North, "Leeds, Stourton and West Yorkshire Connectivity"

Source: Network Rail "CMSP: Sheffield Demand Analysis Note" and "Greater Manchester's South East Rail Corridor Study 2020" (Base Year 2016)

As a result of this continuous growth over the last 20 years, the proportion of crowded services has increased and both local and longer distance services are affected by significant overcrowding at peak times. The Passengers in Excess of Capacity standard, which shows the proportion of standard class passengers that is above an accepted capacity level (allowing for both seated and standing passengers) on services at their busiest point, indicates trains arriving at and departing from Sheffield in the morning peak period were over capacity by 1.2% in 2017, while in the afternoon peak the figure was 0.8%. For Leeds, the corresponding figures are 3.3% in the morning peak and 1.7% in the afternoon peak and for Manchester, 4.3% in the morning peak and 2.2% in the afternoon peak.

Whilst the potential impact of the COVID-19 pandemic on future rail demand is not yet clear, a return to even previous levels of demand within the next decade will result in that demand being in excess of the capacity available along the corridors between Sheffield and Leeds and Manchester – it is crucial that the IRPMN recognises the importance of improving service levels and that the capacity to achieve this should be a key component of any future investment.

## FUTURE RAIL INVESTMENTS

### HIGH SPEED 2

Although being developed as a new national high speed rail network, the HS2 project has been divided into three main phases for delivery:

- Phase 1 will connect London and Birmingham via a new high speed line, after which it will re-join the existing West Coast Main Line for connections to the North West and Scotland – this phase is under construction and will be opened in stages between 2028 and 2031
- Phase 2a will extend Phase 1 and connect from Fradley in the West Midlands to Crewe – the Oakervee Review recommended the merging the construction of Phase 2a with Phase 1



- Phase 2b line comprises eastern and western legs – the western leg will extend the Phase 1/Phase 2a proposals from Crewe to Manchester, Liverpool and onto the West Coast Main Line near Wigan, whereas the eastern leg will run from the West Midlands to the East Midlands, Sheffield, Leeds and York before joining the ECML at Church Fenton for onward connections to the North East and potentially Scotland, with delivery expected between 2035 and 2040.

Phase 2b includes a dedicated spur taking high speed trains off the HS2 main line south of Chesterfield and running into Sheffield city centre on existing lines, which would be electrified, with some capacity improvements required between Dore and Sheffield. There are also plans for a junction back on to the HS2 main line from the Dearne Valley Line north of Sheffield at Clayton, to allow HS2 and/or NPR services to use the HS2 main line between Clayton and Leeds/York.

However, improvements to the network between Sheffield Midland and Clayton Junction are not included within the remit of HS2 Ltd and the scope of Phase 2b at this time – they are within the remit of Transport for the North (TfN) to deliver as part of the NPR project – **this is an example of the disjointed approach that the IRPMN should look to address.**

To support SCR's submission to the IRPMN, we have assessed the extent to which the current proposed HS2 alignment through South Yorkshire could and should be revised, to mitigate impacts on property and businesses – an appendix to this document provides further details.

Whilst it has been suggested that revising the scope of HS2 in terms of maximum line speed could present opportunities to revise the alignment, speed is actually less of an issue than might appear to be the case in terms of potentially re-examining the proposed HS2 alignment. Even using a lower 140mph design speed, there is little to be gained from tightening curves and increasing gradients, and if such a review were necessary, it must consider the whole of the HS2 Phase 2b eastern leg alignment, rather than just the section through South Yorkshire.

When major strategic national infrastructure is being delivered, it is unfortunately inevitable that there will be some winners and some losers. What the review undertaken demonstrates is that the proposed HS2 main line alignment (via the M1 and M18 corridors) has taken into account, as comprehensively as possible, a wide range of potential impacts and associated mitigations.

On this basis, the SCR's requirement for the section of HS2 main line passing through South Yorkshire is that **the highest levels of mitigation of local impacts must be applied, consistent with and similar in nature to those employed for HS2 Phase 1.** SCR and local partners expect to be fully involved in discussions at the earliest stage and throughout the planning and design process in order to provide the best possible local knowledge and advice regarding potential impacts and their mitigation. In most cases, the emphasis is likely to be on minimising disruption during the construction phase – this is especially so for the section at Bramley, adjacent to the M18. Innovative construction techniques must be considered in order that detriment to residential and business properties is eliminated at this location.

The current plans for HS2 services for Sheffield Midland station are two classic compatible trains per hour (tph) between London Euston and Sheffield with a journey time of about 87 minutes, compared with 120 minutes for the current fastest train via the Midland Mainline. Provision of a new junction at Clayton alongside an upgraded 'northern loop' connection north from Sheffield Midland, would enable the two HS2 London services to continue north to Leeds and for this route to potentially also be used by Birmingham to Leeds HS2 services, adding a further two HS2 trains into Sheffield, and also helping to deliver the plans for NPR on this corridor. However, as delivery of the 'northern loop' is within the remit of TfN the through NPR project, there is currently no commitment for HS2 Ltd to extend any HS2 trains north of Sheffield to Leeds.

## NORTHERN POWERHOUSE RAIL



NPR is TfN and the Government's vision to transform the economy of the North of England by significantly improving the capacity, frequency and journey times of rail links between the main economic centres and important hubs in between. The current proposal is to provide four tph between Sheffield and Leeds with an expected journey time of just over 20 minutes and four tph between Sheffield and Manchester with a journey time of between 33 and 38 minutes for the fastest services (the original conditional output for both corridors was 6tph in 30 minutes).

The infrastructure proposals to achieve these plans between Sheffield and Leeds include an upgrade of the existing route between Sheffield Midland and the proposed Clayton Junction including track re-alignment, re-signalling and electrification, as well as the grade separation of Wincobank Junction. Two new NPR stations also form part of these plans to unlock sustainable economic growth in areas of high multiple deprivation.

The first is a new parkway station located in the Dearne Valley, adjacent to the A635 at Goldthorpe, which would provide access to HS2/NPR services for parts of Barnsley, Wakefield and Doncaster districts rather than accessing these services at Sheffield or Leeds.

Destination	Current Minimum Journey Time from Dearne Valley Towns	Indicative Journey Time from Barnsley Dearne Valley station
Leeds	40 mins	15 mins
Sheffield	27 mins	12 mins
York	83 mins	20 mins
Birmingham New Street / Curzon Street*	114 mins	56 mins
London Euston	203 mins	95 mins

Indicative journey times from the proposed new station are displayed in the table – current minimum journey times are based on the fastest journey times from the existing Dearne Valley stations (Thurnscoe, Goldthorpe and Bolton-on-Deane). It is expected that the station will attract commuters wishing to travel to Leeds and Sheffield, who may currently drive given the surrounding catchment is not directly served by a rail station at present.

The proposed new station at Barnsley Dearne Valley supports ambitious local plans for housing growth in the area, create development opportunities for investment, maximising the impact of NPR and other transformational investments such as the SCR's own plans for direct and quick bus rapid transit connections between Barnsley and Doncaster along with improvements to the A635, particularly around the villages of Hickleton and Marr, which will also enhance access to the new station.

The importance of this station, benefitting areas of South Yorkshire, but also areas to the south of the Leeds City Region, means that **the accelerated development of the station and its necessary connections should be advocated within the IRPMN.**

TfN is also proposing a new NPR station on the main line at Rotherham to support the economic regeneration of the town. This station will allow NPR trains between Sheffield and Leeds and Hull to stop there and will significantly enhance regional rail connectivity for Rotherham, enabling residents and businesses to capitalise on the benefits generated from NPR services. The Manchester Airport to Cleethorpes NPR service could also stop at the proposed station.

Furthermore, other local and regional services could potentially also call at new station, providing local connectivity to sizeable towns including Wakefield, as well as intermediate stations to Sheffield and Leeds.



A tram-train stop on the nearby branch line would link the new station to the town centre, and other local communities.

To ensure that the new station can bring much needed early economic benefits to Rotherham, **its accelerated delivery should form part of the IRPMN.**

Onward connections to the North East can be provided through the HS2 main line spur east of Leeds and thereafter the ECML from Church Fenton. Complementary upgrades to the line from Sheffield to Hull (via Doncaster) are also envisaged to deliver the plans for 2tph NPR services in this corridor, one via Selby and one via Goole.

The infrastructure proposals to achieve these plans between Sheffield and Manchester include an upgrade of the existing route beyond the committed Hope Valley Line improvements, including track re-alignment, capacity enhancements, re-signalling and potential electrification to enable 100mph running.

There are currently two options being considered for the route into Manchester Piccadilly – one would see all 4tph passenger services going via Stockport, whilst the other would see 2tph NPR services routed via Marple into the proposed HS2 station at Manchester Piccadilly and the remaining 2tph via Stockport. Given the importance and additional benefits of enhanced connections to Manchester Airport, the Liverpool City Region, North Wales and the North West, the second option is preferred NPR solution for SCR. This would allow 2tph NPR services to use the HS2 Manchester spur to carry on to Manchester Airport and Liverpool, and for the other 2tph to potentially be extended to Chester and Preston/Blackpool.

## HOPE VALLEY LINE IMPROVEMENTS

There have been plans in place for some time to improve the Hope Valley Line in order to provide the ability to run a third fast passenger service in each hour as well as providing additional freight benefits and much-needed additional resilience for trans-Pennine connections (particularly when compared to the alternative road network).

Providing a high performance, intercity style service with modern rolling stock and significantly more seats as envisaged in the NPR plans is a high priority for both SCR and Greater Manchester in order to provide much better connections between two of the UK's largest city regions. These proposals can be delivered in a phased manner to achieve benefits earlier and be integrated with wider plans for HS2, NPR and classic network services, including freight.

A Transport and Works Act Order was granted for the first phase of these plans in 2018 and includes:

- A 1km passing loop to be provided near Bamford station alongside the existing line, to allow fast passenger trains to overtake slower freight services
- Dore South Curve to be extended between West View Lane and Dore West Junction, again to allow fast passenger trains to overtake slower freight services
- Capacity of Dore and Totley station to be improved, including a second track through the station and a new platform provided, to be accessed by a new footbridge and lifts.

Network Rail has planned to deliver these improvements within the next three years (by 2023) as part its CP6 plans and they form the basis for the further improvements needed to the Sheffield to Manchester corridor to deliver the proposals for NPR. **It is vital that the third fast train per hour is planned for as part of the IRPMN.**

## LOCAL RAIL CONNECTIONS

The SCR IRP sets out the City Region's proposals to enhance local rail connections that support sustainable economic growth and the plans for decarbonisation. These comprise a mix of service, station and infrastructure improvements, including electrification, that aim to make use of and build on the HS2 and NPR proposals and to spread the benefits of national investment as widely as possible across the SCR.

In addition to a programme of station improvements and potential new stations, such as at Waverley on the Lincoln Line, service aspirations include two trains per hour between Sheffield and Huddersfield and a bid to re-open the Barrow Hill Line between Sheffield and Chesterfield.

## EXTENDING THE SUPERTRAM NETWORK AND SERVICES

In 2018 a trial of tram-train services commenced between Sheffield and Rotherham Parkgate, utilising sections of both heavy rail and light rail networks. This complements the existing stopping heavy rail service between Sheffield and Rotherham whilst providing enhanced accessibility for locations in between. TfN plans to extend tram-train services through to Swinton and then onwards to Doncaster as part of the NPR plans for the Sheffield to Leeds corridor.

Extending the tram-train service is dependent on the renewal of the Supertram network, for which a business case has recently been submitted to Government, and a study commissioned by SCR is also underway looking at extensions to that network within and beyond Sheffield to serve the future needs of the City Region.

## FUTURE CONNECTIVITY REQUIREMENTS

The SCR MCA recently published an updated Strategic Economic Plan (SEP) for consultation. The SEP sets out what needs to be done to grow the economy and transform the lives and wellbeing of people, in the city region and aims to create a stronger, greener and fairer future.

At the core of the SEP's approach is a focus on building on the SCR's existing capabilities to increase productivity and innovation in key future sectors of the economy, which are priorities in the Government's Industrial Strategy.

These include:

- Advanced Manufacturing and Engineering;
- Intelligent Mobility;
- Construction;
- Health;
- Digital.

***"Sheffield City Region will grow an economy that works for everyone. We will develop inclusive and sustainable approaches that build on our innovation strengths and embrace the UK's 4th Industrial Revolution to contribute more to UK prosperity, and enhance quality of life for all."***

To help achieve its vision, a high priority for the SEP is to improve and decarbonise transport networks to enhance access to jobs, markets, skills and supply chains, and business-to-business connectivity. Rail can effectively move very large numbers of people in and out of city centres – this produces stronger agglomeration effects and provides increased access to amenities such as entertainment and services, supporting economic growth within city centres, and the nearby towns that people commute from. Rail can

also offer faster journeys between city centres, increasing the market for firms in each city and allowing successful businesses to grow. Hence an effective and resilient rail network is key the SCR's future plans.

This approach is supported by the TfN Strategic Transport Plan, which identifies the North's prime and enabling economic activities that are already strongly performing sectors that will continue to compete nationally and internationally.

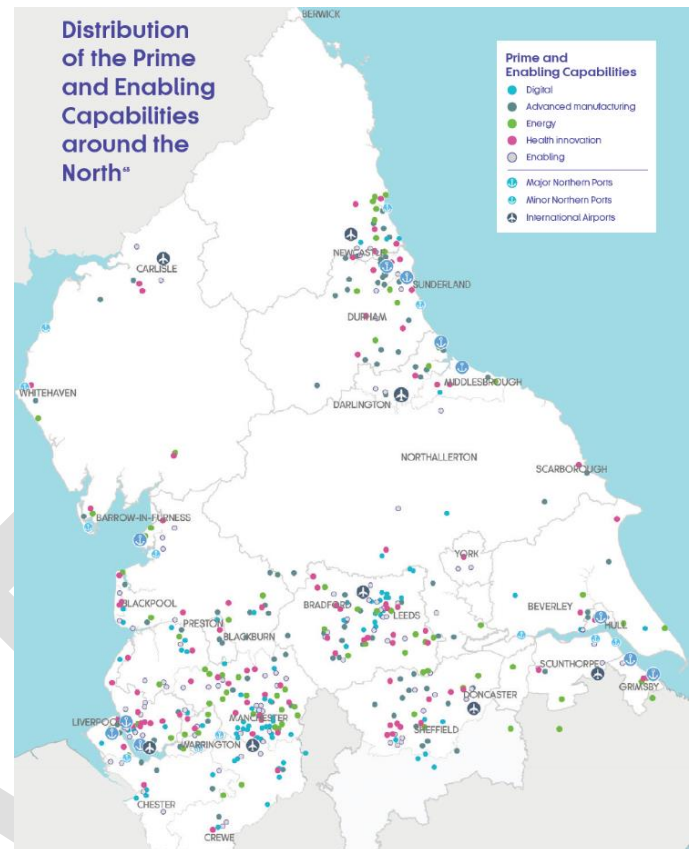
The mapping of these capabilities clearly show the importance of connectivity to the adjacent city regions of Leeds, Manchester and the East Midlands for the health and digital sectors of the SCR, both of which will benefit from the investment in HS2 and NPR. However, SCR has also identified a need for better connectivity to the internationally significant health innovation cluster around Cambridge and Peterborough.

The TfN analysis also shows important connections to North East and Lancashire for the advanced manufacturing sector, neither of which will be served particularly well by the HS2 or NPR services currently proposed. Further afield, advanced manufacturing clusters in the West Midlands and the West of England could become more attractive markets for SCR businesses as result of improved connections.

The establishment of the National College for Advanced Transport and Infrastructure in Doncaster and Birmingham is one part of the response to the changing skills needs within engineering and construction. Developing a higher skilled workforce along with the growing use of digital technology and rise of automation, will increase productivity and competitiveness. The University Technical Colleges and leading engineering departments at universities in the city region will also be fundamental to meeting these needs. The SCR's plans for rail investment set out in the SCR IRP are geared to ensuring a high level of accessibility to higher and further education, supporting the investment in HS2 and NPR.

Access to national and international markets is essential in our ever-increasing global economy. We are in an excellent position to capitalise on our existing assets to achieve this, particularly Doncaster Sheffield Airport and the proposed development around it. However, connectivity to the Airport needs to be as sustainable, efficient and effective as possible.

Finally, continued access to the North's ports will be critical for our growing logistics sector, notably towards the East Coast ports, supporting the ongoing development of rail freight terminals around Doncaster, most notably the iPort site, a 171 hectare intermodal rail terminal that is the largest rail terminal in Yorkshire. In outlining plans to improve connections to ports, we will seek to increase the use of rail for freight wherever possible.



## MAXIMISING THE OPPORTUNITIES OF HS2 AND NPR – A BETTER DEAL FOR SOUTH YORKSHIRE

Building on the current rail network, the plans for HS2 and NPR and the future connectivity needs described above, SCR has considered the opportunities for investment in services, stations and infrastructure to secure a better deal for South Yorkshire – **these should be included within the IRPMN.**

### SERVICES

Various indicative train service specifications (ITSSs) are being developed across the different projects – this is a further indication of the lack of integration that the IRPMN should look to address. Whilst these service specifications are not timetables – they are simply designed to test infrastructure requirements – they are a close indication of the potential services and station stops that are likely to operate in the future. A key recommendation of the IRPMN should be that there is **a comprehensive overview of HS2, NPR and Midlands Engine Rail proposals to establish potential synergies across ITSSs as well as conflicts and duplication.** Future service aspirations and needs should drive infrastructure investment, not the other way round.

Rail connections between Sheffield and both Leeds and Manchester are relatively poor at present for comparable city region pairs located relatively close together – this is why NPR is such a crucial investment for the SCR, but only with the right pattern of services. At present, there are some sub-optimal timings and service propositions from HS2 and NPR for SCR.

With HS2, the SCR sees the two services per hour to and from London Euston as a minimum baseline and accepts that their timings will be fixed from London. We expect to see both of these HS2 trains extended north to Leeds via the 'northern loop' and for HS2 to provide at least two of the four NPR services on that corridor. However, SCR would like to see one of these London services call at Birmingham Interchange to provide international connectivity at Birmingham Airport and also a connection for Birmingham Curzon Street.

Two HS2 Birmingham to Leeds services were also shown routed via Sheffield in earlier HS2 and NPR ITSSs, thereby providing Sheffield with high speed connectivity to Birmingham and also providing the other two of the four NPR services in the hour between Sheffield and Leeds. However, following pressure to route these two services via the HS2 main line to provide a faster journey time between Birmingham and East Midlands hub and Leeds, it now looks likely those trains will not serve Sheffield. If these services are routed via the HS2 main line, then the SCR would expect to see two NPR shuttle services provided between Sheffield and Leeds at even intervals, and for the potential to extend these south of Sheffield to the East Midlands and Birmingham using the HS2 main line considered.

In addition, SCR expects to see a direct HS2/NPR service between Sheffield and York/Newcastle via the 'northern loop' and HS2/ECML.

SCR is supportive of the NPR proposals for enhanced connections to Leeds and Hull and will work with TfN to understand how NPR and/or HS2 services can also connect the SCR to the North East and Scotland, as well as the East Midlands.

CrossCountry services provide important regional connections for a number of places that will not be served directly by HS2 or NPR and this connectivity should be maintained both pre- and post-HS2 and NPR. In addition, noting the importance identified previously of continued connections to the North East and Scotland, as well as to the West Midlands and the South West of England, SCR would seek the retention of the current 1tph CrossCountry service via Sheffield and Leeds as well as the 1tph service that is proposed to be truncated at York (or Scarborough) via Doncaster, with both CrossCountry services continuing south from Sheffield to Birmingham via Derby. Through connectivity to Oxford, Reading,

Southampton, Bristol and the South West should be retained. Early delivery of the 'northern loop' proposals should facilitate this. Whilst HS2 Ltd has not formally identified service patterns from Birmingham Curzon Street via the eastern leg of Phase 2b, SCR will seek 2tph via Chesterfield and Sheffield. These could continue to destinations north of Sheffield to meet NPR and/or HS2 service requirements.

Services on the MML should take advantage of released capacity south of Chesterfield to consider new markets and destinations that complement the SCR's economic growth ambitions. In particular, there is the desire to extend a London St Pancras MML service that currently terminates at Sheffield Midland through to Barnsley and onwards to Leeds, although the viability of this proposal may depend on the rolling stock used for such services in the future.

There is also an outstanding Northern Trains franchise commitment (under the 'Northern Connect' brand) to provide a second fast hourly service between Sheffield and Leeds, via Wakefield Westgate. In the short term at least, this remains a service that the SCR would wish to see in operation.

Taking all this into account, the **SCR's expectations for future regional and national services on the Sheffield to Leeds corridor and beyond are as follows:**

- 2tph HS2 London Euston to Sheffield, evenly spaced at Sheffield, one stopping at Chesterfield
- 4tph NPR Sheffield to Leeds, evenly spaced at Sheffield – under current proposals, these would comprise the 2tph HS2 from London being extended north to Leeds via Clayton Junction, and at least two NPR 'shuttle' services with possible extensions south to Leicester and Birmingham via HS2
- A range of services at the two new NPR stations in SCR – under current proposals, these would comprise the 2tph HS2 services from London to Leeds stopping at Barnsley Dearne Valley and the 2tph NPR 'shuttles' between Sheffield and Leeds stopping at Rotherham MML.
- 2tph, evenly spaced at Sheffield, NPR services to Hull (via Doncaster) – 1tph via Selby and 1tph via Goole, with 1tph to stop at Meadowhall and 1tph at the new Rotherham MML
- 1tph to York, the North East (and potentially Scotland) from Sheffield via Dearne Valley and HS2 and 1tph to York via Doncaster
- 1tph Midland Mainline service extended to Barnsley and Leeds
- 1tph fast CrossCountry service between Sheffield and Leeds via Wakefield, with both CrossCountry services continuing south from Sheffield to Birmingham via Derby
- 1tph Northern Connect fast service between Sheffield and Leeds, via Wakefield Westgate, at least in the short term.

These services would be complemented by the extension of tram-train services and connections between Sheffield and Doncaster. An extension of the tram-train network will also assist with some of the capacity problems at Doncaster station, which are currently being examined by Network Rail through their CMSP process. The work to date has identified future capacity constraints at the station, even in the short term with additional LNER services planned from 2021. However, the identified capacity constraints at Doncaster should not be a barrier to continuing the TransPennine Express service between Manchester Airport and Cleethorpes and the hourly service to Lincoln that is included within the East Midlands Railway franchise, as well as maintaining at least the current level of LNER service calls.

For the Sheffield to Manchester corridor, securing the third fast passenger path that the committed Hope Valley Line improvements would facilitate is an urgent requirement – **this additional service needs to serve Sheffield.**

One of the current challenges for the Hope Valley Line is the fragmentation of services between different providers and serving different customers, which includes the need to accommodate important freight demands. This is continuing with the train service options being developed for the different projects – which highlights a lack of integration that the IRPMN should look to address. Whilst it is recognised that these service specifications are not timetables, they are important in understanding the potential services and connections that can be accommodated in the future.



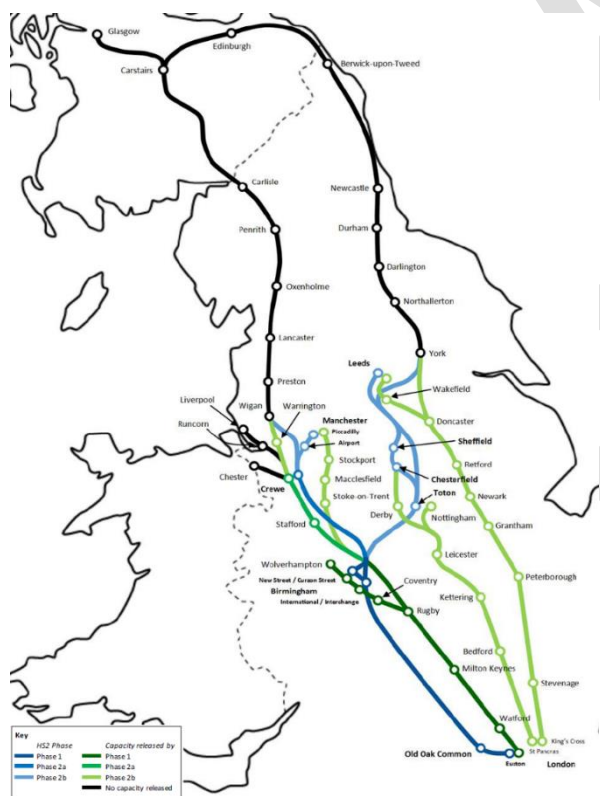
The plans for NPR would deliver a 4tph service between Sheffield and Manchester, although this does not meet the “transformational” journey time of 30 minutes and 6tph that was the original conditional output set for rail links between the two cities. Further, the initial timetabling work for both HS2 and NPR shows that the proposals do not achieve an even spread of services across a standard hour for these services to Manchester, which should be addressed as part of the NPR plans.

Taking this into account, the **SCR’s position for a range of future regional and local services on the Sheffield to Manchester corridor is as follows:**

- 4tph, NPR Sheffield to Manchester, as evenly spaced as possible at Sheffield, with 2tph running onwards to Manchester Airport/Liverpool and possible extensions to Chester and the North West for the other 2tph via Stockport. Eastwards, 2tph will continue to Hull/ Cleethorpes, 1tph to Nottingham and 1tph to Lincoln
- The fastest journey time between Sheffield and Manchester should be as close as possible to the aspiration of 30 minutes
- 1tph stopping service, but with the potential to consider two fast services per hour stopping at intermediate stations such as Hope and Dore and Totley as part of the NPR proposals.

Again, these services would be complemented by a continued improvement in other local rail services as set out in the TfN Long Term Rail Strategy, a number of which were set out in the SCR IRP and include:

- 2tph service between Sheffield and Huddersfield
- Services extended to Bradford.



The diagram opposite shows the potential capacity across the existing classic rail network released by the various phases of HS2. Whilst this initially looks advantageous to the SCR, in reality, there is likely to be very little genuine capacity release as locations not served by HS2 and NPR directly will want/need to retain existing levels of service and see little, if any, increases in journey time for existing services. This conflict means that SCR is pragmatic about how it seeks to maximise the benefits of released capacity through revised service plans.

Future services on the MML should take advantage of released capacity to consider new and existing markets and destinations that complement the SCR’s economic growth ambitions, such as Leicester.

The proposals for ECML services post-HS2 are less well-defined, but we acknowledge the ongoing constraints of the section between London King’s Cross and Peterborough and the aspirations for a 9tph service on the ECML north of the connection with HS2 at Church Fenton being developed as part of the NPR proposals.

The demand forecasts undertaken to date suggest that HS2 abstracts a large proportion of long distance demand and changes the purpose of the ECML to mainly long distance travel between larger towns and medium distance regional connectivity. This allows the role of services on the ECML to be repurposed, providing opportunities for new connections from Doncaster to places such as Cambridge as part of revised service patterns to support the SCR’s economic growth ambitions.

## STATIONS

Key pedestrian and cycle routes

Train routes and potential tram stops

Inner Relief Road and potential new junctions

Key nodes and connections

Platform lengthening at Barnsley will be required to accommodate MML services extended to the town to provide a new direct connection to the East Midlands and London, allied to the radical transformation of the town centre and the ambitious wider growth strategy which supports the delivery of 20,000 new homes and will act as a catalyst to stimulate the delivery of 220 hectares of employment land by 2033.

At Doncaster, SCR and local partners have already committed funding to recently completed improvements to the station forecourt that enhance the gateway setting of the station and its connections to the town centre, but once the scale of the track and platform improvements required are established through the CMSP work, **there is a need to consider further improvements to the station as part of a holistic future programme**. Recognising the continuing vital economic role of the ECML for north-south connectivity, a commitment to deliver a programme of improvements at Doncaster arising from the CMSP work will be vital. Production of an overarching masterplan relating to the development of the station and surrounding network is therefore important to prepare to cement the town's gateway role on the ECML.

## INFRASTRUCTURE

The approach adopted by the SCR to the IRPMN has been to identify infrastructure that is either required in advance of, or would be beneficial to deliver in advance of, HS2 and NPR, particularly where the existing rail network is operating above capacity and large parts are significantly constrained. With the proposals for HS2 and NPR, it is essential that parts of the existing rail infrastructure are improved to accommodate a mixture of new and existing services.

But how these improvements are delivered is also important, bearing in mind the decarbonisation and 'levelling up' agendas, both of which become even more critical in a post-COVID-19 pandemic recovery period. The way in which the proposals for HS2 and NPR have been developed separately miss the opportunity for more thematic and geographic development and delivery.

### Electrification required for a net-zero carbon railway

- Definite
- Possible
- Unlikely
- Never
- Battery trains

### Existing Electrification

- 25 kV AC
- 750 V DC



For example, the SCR has recently re-iterated its support for the electrification of the MML north of the current scheme to Market Harborough – this improvement has a strong business case and was dropped from previous programmes due to the programme of austerity in the early part of the last decade, but with the Government itself indicating that it needs to go further with the electrification of the UK's rail network, the MML is a prime candidate for such a programme. Indeed, Network Rail has identified full electrification of the MML as a requirement to achieve a net-zero carbon railway as shown by the diagram opposite.

The previous MML electrification proposals continue to Sheffield Midland, and will overlap with many of the HS2 infrastructure improvements planned between Stonebroom Junction and Sheffield. However, the NPR proposals between Sheffield Midland and Clayton Junction also involve electrification, bringing **forward the opportunity to consider the electrification of the whole route between Stonebroom Junction and Souty Kirkby Junction (the connection onto the ECML) as a potential opportunity that will benefit all MML and CrossCountry services using this part of the network well in advance of HS2 and NPR.**

Combining electrification with the identified linespeed improvements and resignalling between Sheffield Midland and Clayton Junction would deliver a HS2 and NPR-ready section of the network within the next 10 years. This should include a phased approach for improving capacity through Wincobank Junction, addressing some of the existing capacity constraints early, whilst recognising that the larger, more costly grade separated intervention would support longer term growth and new services and be delivered later in the programme, along with capacity improvements between Aldwarke Junction and Swinton and the remodelling of Masborough Junction.

In addition, **the capacity improvements identified between Dore and Sheffield as part of the HS2 proposals could be also accelerated** (either in isolation or as part of the wholesale improvement of the

line between Stonebroom Junction and Sheffield Midland proposed for HS2) well in advance of HS2 Phase 2b to complement the committed Hope Valley Line improvements and assist with journey times and resilience on the Sheffield to Manchester corridor.

When designing the connections between HS2 and NPR with the existing rail network, it will be important to provide flexibility for future growth and connectivity – for example, a 4tph connection at Stonebroom Junction should be provided and the suggestion from the Leeds City Region that an all-moves junction be provided at Clayton has some merit.

This is also why the configuration of Manchester Piccadilly station is important to the SCR, as this will impact on the choices, phasing and future flexibility of services between Sheffield and Manchester, and beyond.

**A commitment to the extension of the tram-train network through to at least Doncaster** will also start to prepare this part of the SCR's rail network in supporting the plans for HS2 and NPR by creating better access from across the City Region to these national interventions, but also freeing up capacity on the classic network and at Sheffield Midland for regional and national rail services.

The infrastructure upgrades on the line between Sheffield and Swinton will also benefit the NPR route between Sheffield and Hull, as will the tram-train proposals. The line between Swinton and Doncaster will also be electrified for tram-train, and NPR services to Hull via Selby can take advantage of this, as well as potentially other services.

SCR supports the planned capacity improvements on the ECML north of York being developed by TfN and the relevant local and combined authorities to accommodate a mix of HS2, NPR and other services. There are already capacity constraints on the ECML north of York and the HS2/NPR proposals will not resolve these and will probably require choices on how the available capacity (even with enhancements) is used – this could impact on the service choices for the SCR to the North East and Scotland.

It is therefore vital that an integrated solution is developed for the ECML. This should consider options for re-opening the Leamside Line for freight and potentially local passenger services to free up the ECML for express services. This would allow then allow the development of a freight priority route from Doncaster to Newcastle (connecting with the GN/GE Line), which could also potentially release capacity for NPR services from Sheffield to Hull. Where possible enhancement schemes should be delivered early as enabling works for HS2/NPR, such as a series of line speed improvements to allow 140mph running and early wins at York and Darlington.

The ECML Route Study identified a mixture of infrastructure, signalling and rolling stock improvements between Doncaster and Leeds and the potential for additional platforms on the west of Doncaster station to allow more capacity for connecting trains from Sheffield and Leeds.

For the ECML and MML south of the SCR, future infrastructure needs will be driven by the service patterns post-HS2, but the SCR considers that there are clear opportunities for new connections by rail using the existing infrastructure more efficiently in the first instance, particularly how any released capacity can support economic growth in Doncaster and at Doncaster Sheffield Airport. Capacity released on the southern section ECML could also be used to serve intermodal freight flows from East Anglia and the Thames Gateway to Yorkshire and the North East as well as a revised passenger service pattern serving more of the intermediate stops and potentially new destinations such as Cambridge.

There is already the opportunity to free up additional capacity on ECML through a small number of incremental schemes south of York, including improving freight capacity – in the shorter term this would address some of the current timetabling issues on the ECML and maintain the current level of station calls at Doncaster in advance of HS2.

To complement HS2 and NPR, we will develop future infrastructure requirements across the local SCR network as necessary to support the service and journey time aspirations set out in the TfN Long Term Rail Strategy. Journey time improvements on the Hallam Line between Sheffield, Barnsley and Leeds will be



promoted as one of TfN's first packages of improvements to achieve the journey time standards between major centres set out in the Strategy.

To affect the modal shift contained within the SCR's Transport Strategy may require a minimum of 4tph frequency, which is not achievable in all locations, and so **effective connections and interchanges become even more important** to achieve the Mayor's Vision for Transport.

Beyond the proposals to re-open the Barrow Hill Line between Sheffield and Chesterfield, we will investigate opportunities to re-open other disused rail lines and stations and establish new services on existing non-passenger lines, including the Don Valley Line (Sheffield Victoria to Penistone) and the Barnsley to Wakefield Line (via Royston), and Askern Line between Doncaster and Knottingley. These may involve the re-opening of Sheffield Victoria as a second station within the City Centre, and we will also develop options to build new stations where there is likely to be increased demand, such as Waverley and Askern. To support this, **it will be important to ensure that Network Rail does not dispose of existing assets that may be needed in the future.**

## AN INTEGRATED DELIVERY PROGRAMME

Drawing together the analysis undertaken, the SCR has developed a suggested integrated delivery programme, based on three categories and timeframes used in the SCR IRP – **this programme is offered for inclusion in the IRPMN**. This programme is aligned with emerging plans of adjacent authorities and with Network Rail and TfN.

### *Delivery in the Next Five Years (up to 2025)*

- Additional Sheffield to Leeds fast service as part of the Northern Connect proposals
- Committed Hope Valley Line improvements and the provision of a third fast passenger service each hour, serving Sheffield
- Electrification of the MML from Market Harborough to Sheffield
- First phase capacity improvements at Wincobank Junction
- Renewal of Sheffield Supertram system
- Linespeed and capacity improvements from Sheffield to Hull for the two NPR services planned
- Examining the feasibility of extending an hourly MML service to Leeds via Barnsley, with platform lengthening at Barnsley to facilitate this
- Journey time improvements on the Hallam Line between Sheffield, Barnsley and Leeds.

### *Development in the Next Five Years (up to 2025), Delivery between 2025 and 2030*

- New stations at Barnsley Dearne Valley and Rotherham Mainline, with a range of existing CrossCountry, TransPennine Express and Northern Trains services calling there
- Platform lengthening at Sheffield Midland station and first phase of masterplan delivery
- Platform lengthening at intermediate stations on the Hope Valley Line to accommodate longer trains
- Capacity improvements between Dore and Sheffield
- Electrification and linespeed improvements between Sheffield and South Kirkby Junction and grade separation of Wincobank Junction, enhancing journey times for CrossCountry services
- HS2 mainline between Clayton Junction and Leeds, facilitating the opportunity for the two NPR 'shuttle' services between Sheffield and Leeds to commence
- Conversion of Rotherham Parkgate to Swinton and Doncaster local rail services to tram-train operation with enhanced local connections/new stops along the route
- Doncaster Station Masterplan
- Enhanced rail access to Doncaster Sheffield Airport
- Re-opening of the Barrow Hill Line between Sheffield and Chesterfield
- First phase of improvements on the ECML north of Church Fenton.



*Further Investigation in the Next Five Years (up to 2025), Development between 2025 and 2030, Delivery post-2030*

- Full delivery of the Sheffield Midland Station Masterplan, including extensions to the Sheffield Supertram network and further tram-train conversions
- Completion of the HS2 mainline, facilitating the 2tph HS2 services to London and further HS2 or NPR connections to the West and East Midlands
- Completion of the HS2 station and connection at Manchester Piccadilly, providing the ability for services from Sheffield to access a greater range of destinations beyond Manchester
- Completion of the NPR infrastructure improvements for the Sheffield to Manchester corridor
- Enhanced rail access to Doncaster Sheffield Airport
- Further improvements on the ECML north of Church Fenton
- Capacity and service improvements between Sheffield and Huddersfield.

A rolling stock strategy also needs to be developed that is in step with the consideration of infrastructure options for coherent traction/capacity/performance/connectivity reasons – there are recent examples of where there has been a mis-match between rolling stock and infrastructure, particularly around electrification, which should not be repeated as more of the network is electrified.

Implementing this programme will show what can be achieved in practice by a fully integrated approach, including delivering benefits early, providing enabling infrastructure, gaining efficiency in costs and delivery, reducing disruption and complementing the SCR's own transport, spatial and economic plans. It also provides a clearer link to the required investment in skills and supply chains, with greater opportunities for locally-based suppliers to become involved in the delivery of smaller scale, linked projects within a rolling pipeline rather than one large project.

Through its commitment to develop the city regional transport network as part of the recently signed Devolution Deal, in addition to its net-zero targets, the SCR has signalled what it will do to reap the benefits of the planned investment in HS2 and NPR within the SCR. The IRPMN offers the chance to build on this and set out a clear plan as to how rail can play its full role in building back better.

