

## WHY WOULD HS2 BE GOOD FOR BRITAIN?

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# WHAT ARE THE LIKELY ECONOMIC AND SOCIETAL IMPACTS OF HS2?



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**Without a transport system an economy cannot function. Accessibility increases both the density of employment and of population. The Eddington report for the UK government supported this proposition and it has been the basis for the decision to invest in Crossrail.**

Success in a globalised economy relies on cities and their infrastructure. Cities are by far the most important source of economic activity and growth in the UK economy. Nearly 80% of people in the UK live in an urban area and cities, even though urban areas only cover 9% of the UK's land mass .

Successful city economies require high volumes and densities of face-to-face contacts between firms, and access to wide pools of skilled labour. Good transport links, particularly rail, are essential in supporting this agglomeration. Additionally, high levels of physical accessibility nationally and internationally are needed for cities to be economically competitive.

Cities generate economic growth by creating business opportunities. Agglomeration (or clustering) is the process by

which this density of economic activity raises productivity. It does this by facilitating knowledge transfer and fostering innovation between firms and other knowledge producers such as universities and high-level government functions.

Considerable research has been conducted to back this up both in theory and practice. Paul Krugman, the Nobel laureate economist, has been central to this work . This manifests itself in high densities of employment in advanced sectors such as financial and business services, design, science and creative industries, which also support advanced manufacturing sectors across city regions. Skilled labour is vital in supporting this economic activity. Workers need to be able to access main city employment locations from across a wide area.

The UK lags behind its competitors in infrastructure investment: the globalising economy is characterised by innovation and new opportunities. The agglomeration offered by cities is one of the main reasons why they have become a key delivery mechanism for growth. The UK

ranks only 34th in the world for its infrastructure, sixth in the G8 countries , and only spends 1.5% of GDP on infrastructure compared with 6% in Japan and 3% in France .

Better transport results in stronger local economies and jobs growth: history shows a compelling link between transport and economic prosperity, and analysis has shown that a location with 10% higher rail connectivity has an employment density that is 14% higher. An additional 400,000 jobs in Core Cities and a total 1 million in their wider urban areas will be underpinned by HSR.

Investment in a full HSR network and electrification will allow the creation of 35,000 jobs in Core Cities, and 1 million jobs in total across their wider urban areas (specifically the geography covered by their Local Economic Partnerships).

To support these jobs, weekly rail volumes into the Core Cities stations (and therefore the infrastructure required) will need to increase by around 70% over the next 20 years, supporting 150,000 new arrivals per day. This represents around 80,000

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additional trips per day on a High Speed line. This is likely to be an underestimate. This represents an increase over twenty years of 17 per cent in employment. The relationship illustrated here suggests that as much as a doubling of rail passenger growth will take place.

The UK's cities drive economic growth and can help invigorate the economy. The Core Cities urban areas already deliver 27% of GDP. Economic growth outside London and the South East is dependent on improved transport capacity and infrastructure between the Core Cities and London, and between

### ... Better transport results in stronger local economies ...

the Core Cities themselves to create more coherent and powerful economic zones. There will be wider positive regeneration and economic benefits from HS2 and a full HSR network, contributing to reshaping and rebalancing the economy.

More rail capacity will benefit wider economic areas: the agglomeration potential of cities and their surrounding areas requires better transport networks. Improving connectivity makes labour markets more effective, facilitates competition, and fosters innovation.

The economic benefits of HSR and HS2 are likely to exceed the DfT estimates: Although DfT has made a strong economic case for investment in HSR and HS2. Based on analysis of previous HSR schemes this estimate of jobs created is likely to be exceeded significantly. The new services bring Birmingham within one hour of London, and the full scheme reduces times for Manchester, Leeds, Sheffield and Newcastle to between 73 and

80 minutes. International evidence shows that such schemes create significant economic benefits, achieve some direct financial returns, more demand than was forecast, and reduce demand for road and air trips. Such benefits are based on trip generation rather than the value of time savings.

The need for HSR is fundamentally centred on the need for additional capacity on the rail network and better connectivity between Core Cities; the West Coast Main Line (WCML), Midland Main Line (MML) and East Coast Main Line (ECML) are forecast to be at or

approaching capacity in the 2020s and this will require a step change in capacity. Upgrading existing lines will not provide the step change in capacity required on the main lines and would be expensive and disruptive. Meanwhile,

### ... More rail capacity will benefit wider economic areas ...

creating a new classic line represents poorer value for money than does a high speed line.

A new approach is needed to assessing the economic benefits of long distance rail projects in the UK. The real benefits of this investment for the economy are not captured by the current analytical approaches used for evaluating transport projects. They do not capture the transformational and regeneration impacts that it can have, or the additional benefits of releasing capacity on existing lines for commuter and freight uses.

Maximising the benefits of HSR will also require investment in existing lines, this is not an 'either or' investment case. Investment in city region transport networks, and strategic inter-urban rail improvements on

existing lines (including electrification) between some cities, and with London are vital to support economic growth and the rebalancing of the UK economy. It is essential therefore that plans for HSR are part of a wider, integrated, national strategy for rail or transport.

Plans for high speed and other transport investments need to be more closely aligned with economic development and land use planning strategies. Transport is only a means to an end and creating a vibrant economy will require other policies. However, without connectivity, economic expansion will not take place.

#### References

- 1 Eddington Transport Study 1 December 2006 to support 2006 pre-Budget report
- 2 ONS The UKs Major Urban Areas
- 3 Fujita, Krugman and Venables, (2001) The Spatial Economy, Cities, Regions and International Trade, MIT
- 4 World Economic Forum's Global Competitiveness Report
- 5 Association for Consultancy and Engineering, Avoiding the Infrastructure Crunch

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## WHY WOULD HS2 BE GOOD FOR BRITAIN?

# HSR FOR BRITAIN – SOME ROUTE AND ENGINEERING ASPECTS



Professor Andrew McNaughton  
FREng  
Technical Director, High Speed Two Ltd

Professor Andrew McNaughton  
FREng

Andrew McNaughton has been engaged in railway construction, operation and management since 1973. He is Special Professor of Rail Engineering at Nottingham University and a Visiting Professor of Engineering at both Imperial College London and Southampton University.

Since 2009 Andrew has been Chief Engineer and Technical Director of High Speed Two Ltd, developing the principles, network and specific route design for high speed rail in Great Britain. Prior to that, from 2001 he was Chief Engineer of Network Rail responsible for the specification and development of the GB rail network, investment authorisation and overall system safety management.

Andrew is Vice Chair of the EU Transport Advisory Group, Chair of the European Rail Research Advisory Council and Special Advisor on rail to the Australian Government. He has lectured on the transport, land use and economic planning effects of regional, freight and long distance rail development in North America, Asia and Australia as well as Europe.

Getting the green light from Transport Secretary Justine Greening in January to develop plans for a high speed rail network that will connect London and the West Midlands in Phase 1 and then the North West through the East Midlands and Yorkshire – plus a link to Heathrow – in Phase 2 by the early 2030s was a significant political achievement.

The idea of such an ambitious project was far from the conventional thinking back in 2009 when HS2 Ltd was set up to examine the case for high speed rail by Andrew Adonis. At that time a third runway at Heathrow was being hotly debated but, unlike now, there was relatively little public discussion on the case for and against a new railway. So why do we want to build a complete new line rather than just improving what we already have?

Britain's rail system is becoming increasingly stretched, particularly in the South East, and between London and our great cities of the Midlands and North. Our population is growing – in England alone it is forecast to be around 60m by 2033 and 70m by 2050 – and passengers numbers continue to rise. Figures show that the number of long distance rail journeys has grown by an average of five per cent a year since 1995. Long distance rail travel has grown strongest of all, even during the

recent economic downturn.

Rail industry projections show that the West Coast Main Line will be full by the mid-2020s so it is vital that we bring on extra capacity.

Upgrading the existing line cannot provide the level we need in the long term. An attempt to do this was made a few years ago and it cost billions of pounds without really addressing the looming capacity crunch. So the choice is between new conventional lines or new high speed lines. The far higher benefits and only marginally higher cost of a high speed line make a compelling case for high speed rail, just as in other countries around the world.

High speed rail as a transport system is not new. The world's first, the Tokaido Shinkansen line, opened in Japan in 1964 and demonstrated the capacity, connectivity, reliability and safety breakthrough possible with a modern, well engineered, dedicated new line between today's major cities of population.

The technology has developed greatly in the last half century, and continues to do so. Quieter and more energy efficient trains capable of 225mph are now entering service in Europe and designs for yet higher speed are under development.

Developing a new high speed network that can connect

up our biggest cities will also stimulate and rebalance our economy, generate jobs as well as developing our skills set.

HS2 is supported by all the major conurbations that it will serve as they recognise the key economic benefits that it will bring. The network is expected to deliver up to £45 billion of business benefits alone.

Detailed assessments of jobs expectations have been undertaken for Phase 1 and we estimate around 40,000 will be generated. We expect that Phase 2 of the Y will also lead to a further substantial number of jobs being created in the major northern conurbations that it serves.

The Phase 2 'Y' network line is due to open in 2032 and it will be the core of the national long distance passenger network. While the route will join Birmingham, Manchester and Leeds new trains will be designed to continue onto the current network, providing direct services to and from Newcastle, Liverpool and Glasgow and Edinburgh. By moving a significant proportion of our current inter-city services from the existing railway onto new HS2 lines, there will be space for additional commuter, regional and freight services, benefiting many others across Britain.

Stretching for roughly 140 miles (225km), the first phase will reduce the travel time



between London and Birmingham to 49 minutes from the current 1h 24mins. The journey between London and Manchester comes down from 2h 8mins to 1h 40mins. The trip to Glasgow will take 4hrs rather than the 4h 20mins it takes now. There will be similar savings to Liverpool. Those living around Birmingham who want to take a trip to Paris will find they can get there in 3hrs compared to roughly 4.5hrs on the current timetable.

With Phase 2 in operation, not only would there be further time savings to the North West and Scotland, but also transformational challenges to the East Midlands, South Yorkshire and Leeds. Direct services from the North and Mainland Europe will be possible into Heathrow.

There will eventually be 18 trains an hour in each direction once the 'Y' network to Leeds and Manchester is up and running. For the Phase 1 route running between London and the West Midlands there would be up to 14 trains per hour running each way on the high-speed line and then on to the

classic network. The dedicated high speed trains could carry up to 1100 passengers each.

The route between London and the West Midlands, which was published when Justine Greening made her announcement in January this year, was one of several that HS2 Ltd has explored over the last three years.

Refining the various route options to one that we were confident to take to public consultation was achieved by balancing the benefits of better connectivity and journey time savings against the environmental impacts and costs. We divided each route into shorter sections and compared them in pairs. The

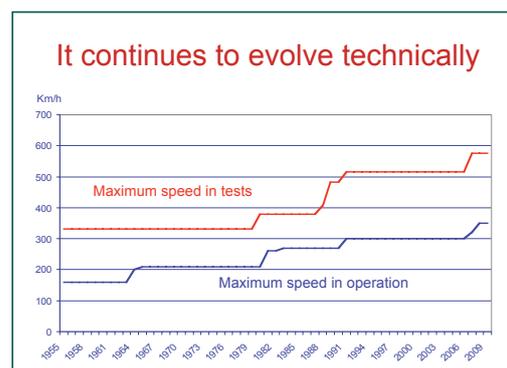
route that was eventually consulted on between February and July last year was the best – in terms of journey times and cost, whilst being comparable to any of the others in its environmental impact.

The public consultation was one of the largest ever held. We visited 31 cities, towns and villages along the line of the route from London to the West Midlands over 40 days. Almost 55,000 responses from organisations and individuals were received and a series of mitigation treatments and route refinements, such as increased tunnelling in North West London and the Chilterns, were agreed by the Secretary of State based on careful consideration of the views expressed.

Great care has been taken to use best practice developed on other high speed lines, especially HS1, to design the proposed route into the landscape and use natural cuttings, and tunnels, to reduce the visual and noise effects.

The route we have today has been extensively consulted on, as well as being reviewed and refined by three successive Transport Secretaries – Andrew Adonis, Philip Hammond, and Justine Greening.

The biggest challenge we face now is to set out in the hybrid bill, which will be laid before Parliament at the end of 2013, how we are going to build the new line on time and within the £16.3bn budget.



It is a challenging timetable that has been set and to help us with the engineering and environmental assessment work we have brought in considerable expertise in the shape of our development partner CH2M Hill, as well as a range of professional service contractors such as Arup, Atkins and Parsons Brinkerhoff to work on stations and systems designs.

To inform this process we are also running an extensive engagement programme with key stakeholders, local authority planners and the local communities along the route. In the summer we will run the second round of our 25 community forums, which will see HS2 Ltd engineering and environmental staff meeting with representatives of those directly

affected by our proposals to hear their views and to explain our thinking and plans.

There will also be a series of formal consultations on property compensation, the parcels of land that need to be safeguarded along the proposed line between London and the West Midlands, as well as the environmental impact assessment.

All this work will take place in tandem with the development of proposals for the Phase 2 Y network – which will spread the benefits of high speed rail further across the country.

At the end of March this year HS2 Ltd submitted a report with route and station advice to the Secretary of State. She is considering this advice while

taking soundings from potential delivery partners in the cities where new stations could be located. The Government has announced that it will publish its response setting out initial preferred route and station options in the autumn.

There is much to be done in the weeks and months ahead.

Doing nothing is not an option and the mooted alternatives can not bring the necessary long term capacity and connectivity benefits HS2 offers. The rail network needs more space and HS2 when built will be the backbone of a new transport system for the 21st century.



## WHY WOULD HS2 BE GOOD FOR BRITAIN?

# WHY THE UK NEEDS HSR TO MANCHESTER?



Sir Richard Leese  
Leader of Manchester City Council

**Manchester has always been at the centre of Britain's Rail network; in 1830 Manchester witnessed the inauguration of the world's first inter-city passenger railway, creating the foundations of a comprehensive national network which has since spread to over 150 countries, encompassing almost a million miles of track.**

On the back of the connectivity and new found opportunities which the railway created, Manchester became the world's original modern city, with an economy encompassing the textile and engineering trades and key scientific breakthroughs. Today's Manchester is just as pioneering. Over the past two decades Greater Manchester has reinvented itself, with an

economic base that has diversified into new knowledge intensive and hi-tech industries. Manchester is home to 65 of the FTSE 100 companies and is a focus for businesses which serve local, regional and

international markets in areas such as legal and financial services as well as e-commerce.

Cities like Manchester are the drivers of our future economy. With over 92,000 businesses

**. . . Manchester became the world's original modern city . . .**

generating nearly £47billion of GVA per annum, the Manchester city region is the fastest-growing economy outside London, and the economic powerhouse of Northern England.

In response to these changes rail has seen its popularity grow as Greater Manchester's Journey to Work Area (already the largest in the country after London and the south east) has continued to expand. As a result peak-time patronage into the centre of Manchester has increased by 30% over the last decade. Furthermore, forecasts as well as experience suggest that this is not a temporary blip, and that as a result of structural changes in

continue to rely on incremental improvements to our existing rail infrastructure to provide this.

Despite £9bn of upgrades, the West Coast Mainline is set again to exceed capacity by mid-2020. The West Coast is the only direct link between Manchester and London, and will see passenger demand grow by as much as 61% by 2025 according to the West Coast Rail Utilisation Strategy. Further upgrades to the line would be short sighted when set against the option to develop a new dedicated high-speed inter-urban network, which will provide unparalleled economic benefits.

placed city in Europe. Similarly the Government recognises that Manchester has the most potential in the UK to establish itself as a major economic centre to complement London and the South East.

However, the introduction of HS2 would bring significant economic benefits which spread far beyond the Greater Manchester area. Analysis suggests that almost 10,000 jobs would be generated across the Northern Way region, boosting productivity and growing the output across the area by £967 million per year. This demonstrates the substantial benefits HS2 will

At the same time, the HSR programme should not be viewed as an alternate to more pressing investment needs in the existing network, but as an addition, in order to future-proof the national rail network. The effectiveness of the HSR programme is reliant upon the efficient running of the conventional network. It is critical that HSR stations and infrastructure are well integrated into existing local rail and tram networks, as the immediate area surrounding the HSR station is unlikely to be the ultimate origin or destination of any journey. Investment must be made to existing facilities or new connections created to allow passengers to transfer quickly to and from their ultimate origin and destination.

## ... the introduction of HS2 would bring significant economic benefits ...

the local economy, growth is expected to continue, despite the recent economic downturn.

Despite this success story, our local economy, and that of the nation, is not as productive as it should be, and poor connectivity to wider markets is partly responsible for this. Journey times of over two hours to London and over one and a half hours to Birmingham are unimpressive when compared with our European competitors. The expansion of knowledge intensive industries is dependent on fast inter-city transport links, and while Manchester is a city fit for the 21st Century, its rail network, which still includes that original 1830 line linking Manchester and Liverpool, is out-dated and not fit for purpose.

There is little spare capacity on the network around Greater Manchester, and we cannot

Just as in 1830 when the railways were originally planned, we now need strong, focused planning to bring our railways up to the best modern standards. A new high-speed line will deliver a quantum gain in connectivity and capacity, while also freeing up space on the existing network for important local travel, freight services, and increased services to intermediate cities.

Manchester is uniquely placed to attract further investment from the extra capacity HS2 would deliver. According to the European Cities Monitor 2010, Manchester was ranked the second-best city in the UK in which to locate a business, and the twelfth-best

offer the whole of the North of England, rebalancing the national economy and help to reduce the £38bn annual North/South productivity gap which is preventing the UK from reaching its full potential.

The alternatives to HS2 generate much lower cost benefits and crucially do not provide the long term capacity increases needed, while further upgrades and investment would suffer from the law of diminishing returns. Similarly investing in a new conventional rail line will only cost nine per cent less than a high-speed line, yet would not provide the required capacity improvements, and, significantly, none of the journey time savings which deliver huge economic benefits.

Just as the original railway boom in Manchester helped to revolutionise Britain into the economic capital of the world, it is essential for current national economic growth that a new HSR line links Manchester and the other major cities of the UK to address the imbalances in our economy. The Northern and Midland regions contributed £415bn, or 34% of total GVA to the UK economy in 2009. Failing to provide extra capacity on the already congested classic rail network will not only constrain economic growth and limit job creation in Manchester, but across the whole of the UK.

We are now half way – most of the rest is OK and I'll send it later – but I wanted to get something to you so I could get on with other things for a bit.

## ... It is critical that HSR stations are well integrated into existing local networks ...