

What is the case for improved connectivity between Manchester and Sheffield? - literature review July 2015

The Trans-Pennine Strategic Tunnel Study (2015 -16) is exploring the feasibility of a high performance road corridor between Sheffield and Manchester - which would require the construction of what would apparently be one of the longest road tunnels in the world - in order to improve economic growth in the north and contribute to the projected extra 44bn¹ that could be added to national Gross Value Added (GVA) per annum if there was one strong northern economy - the Northern Powerhouse.

To date (July 2015) the Tunnel study has not provided robust and quantified evidence to the Stakeholder Working Group of the need for this mode of connectivity (a road tunnel) on this particular corridor - which crosses the Peak District National Park - or its impact on either the economy or environment. To fill this gap this literature search - by environmental stakeholders on the working group - explores the evidence in the public domain around a range of issues that the study needs to consider. As a literature search it is only intended to act as a starting point for subsequent investigation.

This an ancillary document to the submission *Trans-Pennine Tunnel Study: Testing the fundamental feasibility of the project* made to DfT and Transport for the North by Campaign to Protect Rural England, Friends of the Earth, and Friends of the Peak District.

1. Where is the strategic spatial plan for the Northern Powerhouse?

1.1 Transport of itself cannot create economic growth - it needs to underpin a strategic spatial plan which can align housing, economic and transport development across travel-to-work areas² and in a sustainable way.³ However at the moment the Northern Powerhouse does not have a demonstrated spatial geography. It is instead a broad concept that is attempting to unify what are at present separately and partially developed investment programmes. In the absence of a proper spatial plan, it is essential that public investment programmes should demonstrably address the full range of public policy concerns - so connectivity, carbon reduction, air quality, land use, for example - rather than just one aspect of public policy (in this case transport), on one corridor and by one mode.

1.2 Meanwhile TfN's (Transport for the North) 'One North'⁴ and Greater Manchester's 'Transport Strategy Our Vision for 2040'⁵ have pre-empted spatial planning by presenting

1 At the Trans-Pennine Strategic Study Stakeholder meeting on 20 July 2015 Jon Lamonte, CEO TfGM, spoke of creating one economy that could generate an addition £44bn. Lewis Atter, KPMG, in his presentation spoke of increasing the economy by £19bn - is that just the transport contribution or the cost of the tunnel??

2 Greater Manchester is planning for 67,000 new homes and 120,000 new jobs and Sheffield is planning for 43,700 new homes and 80,000 new jobs - Highways Agency South Pennines Route Strategy Evidence Report 2014

³ [Addendum October 2015] We welcome recent statements in IPPR [State of the North](#) report that training, skills and democratic engagement will be essential ingredients for the success of the Northern Powerhouse. For IPPR's four tests see <http://www.ippr.org/publications/the-state-of-the-north-2015>

4 The Northern Powerhouse: One Agenda One Economy One North, TfN, March 2015

5 GM Transport Strategy 2040 Our Vision, GMCA & GMLEP, 2015

transport proposals before there is a spatial framework. Compounding this approach is DfT's (Department for Transport) strategic road building programme which will increase dependence on the private car leading to dispersed development, increased carbon emissions and air pollution, and physical inactivity. The programme is being progressed by Highways England through Route Strategies which manage traffic on the strategic network and facilitate economic growth.

1.3 The Route Strategy for the M62 is based upon improved management of the existing route using Smart Motorway technology, with some junction improvements⁶. Assessment of the impact of smart motorway measures on the M62 is awaited. DfT and Highways England are currently pursuing options to improve transport capacity at the western end of the M62 through the Manchester North West Quadrant Strategic Study.

1.4 The Route Strategy for the South Pennines⁷ has led to proposals for major improvements to the A628 trunk road corridor⁸ - Mottram Moor dual carriageway link between the M67 and the A57T, a link between the A57T and the A57 at Glossop, crawler lanes on the east bound carriageway east of Woodhead reservoir in the National Park, safety and maintenance measures and technology improvements. The dualling of the A616 in South Yorkshire would also be completed. Funding is assured for all these upgrades through the Road Investment Strategy⁹. Furthermore, consultation on a bypass extending east beyond Tintwistle is promised. All this is a radical departure from the past management of the route by the Highways Agency. Previously it had promoted the M62 as the Trans-Pennine route for HGVs and actively discouraged the A682T from becoming attractive to through traffic with safety being the number one priority, even if it worsened journey times¹⁰.

1.5 The Tunnel Study itself is an outcome of same Trans-Pennine Routes Feasibility Study which failed to follow national transport appraisal guidance and began with a road solution rather than first identifying the problem. Investment opportunities focused on the trunk route and excluded all local authority roads, including the A57, but recommended a new strategic study to explore the costs and feasibility of a high performance road link between Manchester and Sheffield through a purpose built tunnel. What role will the Tunnel Study have with respect to the proposed upgrades of the A628T corridor? Will its examination of the wider economic impacts be relevant to the work undertaken on the A628T improvements? And if the Tunnel is deemed of benefit, what will happen to the above ground improvements to the A628T?

1.6 Two further planning points of relevance (a) The London model for economic growth which has benefitted the surrounding areas has not worked in the north - the success of Manchester, Newcastle and Leeds has not spread to neighbouring areas¹¹ (why not?). Any assessment of wider economic impacts in the north cannot therefore assume the southern 'trickle down' planning approach. (b) Public bodies have a duty to cooperate on planning issues that cross administrative boundaries, particularly on strategic issues¹². Manchester and

6 M62 Route based strategy J18-J29 Highways Agency 2013

7 South Pennines Route Strategy, Highways Agency, 2015

8 Trans-Pennine Routes Feasibility Study, DfT, March 2015

9 Road Investment Strategy for the 2015/16 to 2019/20 road period, DfT, presented to Parliament Dec 2014

10 A57/A628/A616 Strategy Summary, Annex A, Highways Agency, 2009

11 City relationships: Economic linkages in northern city regions - Manchester City Region Northern Way 2009

12 National Planning Policy Framework, 2012, para 178

Sheffield are not immediate neighbours for planning purposes. Between them the Peak District National Park Authority must also be engaged.

2. What's the evidence that increasing connectivity leads to economic growth?

2.1 In summary, theoretical estimates abound, but convincing evidence proving connectivity leads to economic growth is limited; new approaches (see para 3 below) may improve the evidence base. Recent work undertaken on behalf of DfT¹³ (TIEP) recommended improvements to transport appraisal to better capture rates of return on particular transport investments. The examples quoted in this paragraph predate this work.

2.2 In developing countries connectivity may increase economic growth but in mature economies such as that in the UK with established transport networks, benefits from improved transport are likely to be from relief of congestion and bottlenecks. How infrastructure is used is as important as overall level of investment. Transport's key economic role is likely to be supporting the success of the UK's highly productive urban areas in the global market, and enabling efficient freight distribution¹⁴.

2.3 There is no simple, unambiguous link between transport provision and local regeneration¹⁵. Benefits might not be evenly distributed across the population, with increased employment in some areas and equivalent reduction in others.

2.4 Eddington¹⁶ estimated that a 5% reduction in business and freight road travel could save businesses up to £2.5bn pa.

2.5 There is plenty of robust research from the UK and around the world showing that investment in road capacity induces demand and creates congestion¹⁷. The costs of congestion to the economy are enormous. Between 2013 and 2030, the total cumulative cost of congestion to the UK economy is estimated to be £307 billion, with the annual cost of congestion set to rise by 63 percent to £21.4 billion over the same period, mainly as a result of population growth and increasing GDP per capita¹⁸. However, arguments about whether congestion is good or bad for the economy continue, with the latest finding that a delay greater than 4.5 minutes on any one-way journey, compared to free flowing traffic, is likely to be bad but it depends on the location¹⁹.

2.6 A twenty minute reduction in travel times in Northern England could provide £6.7million of benefits. In Leeds and Manchester average wages would then increase by between 1.06% and 2.7%²⁰. However, securing these benefits also requires change to the industrial structure and skills-mix.

13 Transport Investment and Economic Appraisal (TIEP): Implications for Project Appraisal, Oct 2014, Venables AJ et al commissioned by DfT

14 The Eddington Transport Study 2006 Exec Summary

15 Standing Advisory Committee on Trunk Roads Assessment, 'Transport Investment, Transport Intensity and Economic Growth' 1999, press release

16 The Eddington Transport Study, 2006

17 'Trunk Roads and the Generation of Traffic', SACTRA, 1994; House of Commons Transport Select Committee Strategic River Crossings Tenth Report 2014-15 sessions, March 2015

18 <http://inrix.com/press/traffic-congestion-to-cost-the-uk-economy-more-than-300-billion-over-the-next-16-years/> This estimate is below that of Phil Goodwin's estimate of £30bn pa by 2010, based on congestion costs of £20bn in 2004

19 <http://www.citylab.com/commute/2013/10/how-traffic-congestion-impacts-economic-growth/7310/>

20 www.centreforcities.org.uk; Spatial Economic Research Centre

2.7 HS1 was predicted, over 60 years, to provide £3.8bn in journey time savings and congestion relief and £3.8bn in wider economic benefits (£1.8bn in agglomeration benefits, £1.7bn in move-to-more-productive-jobs benefit, and £50m in labour force participation and £250m in imperfect competition)²¹. Three years after it opened the National Audit Office²² and local people²³ were providing substantial challenges to these predictions which at present appear exaggerated.²⁴

2.8 One year after opening the New Tyne crossing provided economic impacts but the majority was 'slightly positive rather than significantly positive'²⁵. Only 7% of businesses (the study was skewed to large ones) saw impacts of greater than £10,000pa. Two thirds of businesses believed they had experienced improved vehicle operating costs and travel time reliability but only a minority (5%) of businesses had identified an increase in market share. None considered that the opening of the crossing had been significant enough to already have had an impact on employee numbers.

2.9 Others believe that there is little hard evidence that investment in strategic roads or river crossings help genuine regeneration or create long term jobs rather than just extra traffic²⁶ and have provided substantial evidence of this²⁷.

2.10 'Ultimately the most that can probably be said is improving connectivity and developing services that maintain a city's position as a leading connectivity node will improve its chance of being amongst the winners in terms of future economic growth'²⁸. But of course that 'improved connectivity' can be by all sorts of modes.

3. Do current assessments capture the wider economic benefits of a transport scheme?

3.1 Steps are being taken by Government and others to improve appraisal to capture the wider local and national context. Evaluating the wider economic benefits of Highways Agency schemes has been anecdotal²⁹.

3.2 DfT's webTAG (3.5.14 and A.2) is the standard transport appraisal method. It uses a 'welfare' approach which looks at the direct benefits to users of the transport scheme (drivers and businesses journey time savings). Wider economic impacts are characterized as 'agglomeration, output change in imperfectly competitive markets and labour market impacts - more/less people working and the move to more/less productive jobs'. This process is considered to capture impacts on transport users and businesses well but not the wider economic impacts. Currently the projected economic benefits for road schemes rely on

21 Economic Impact of HS1, Colin Buchanan, 2009

22 The completion and sale of HS1 National Audit Office, 2012;

<http://www.telegraph.co.uk/news/uknews/road-and-rail-transport/8423638/High-speed-rail-Britains-first-link-hasnt-worked-as-planned-say-critics.html>

23 <http://www.telegraph.co.uk/news/uknews/road-and-rail-transport/8423638/High-speed-rail-Britains-first-link-hasnt-worked-as-planned-say-critics.html>

24 This may have been confirmed by a recent Atkins/Aecom/Frontier Economics report: see <http://www.thetimes.co.uk/tto/business/industries/transport/article4587120.ece>

25 The New Tyne Crossing An Economic Impact Assessment, prepared for Tyne & Wear ITA by Newcastle University and CURDS, Nov 2012

26 House of Commons Transport Select Committee Strategic River Crossings 10th Report 2014-15 sessions, March 2015, para 6

27 Investing in road building: The Highway's Agency's million pound traffic gamble, CfBT, 2009

28 The economic value of Connectivity, Oxford Economics and York Aviation April 2013

29 Post Opening Project Evaluation of Major Schemes Highways Agency Meta Analysis 2013 Main Report, 3.3.4, 3.3.4

traffic forecasts that do not reflect the actual changes in traffic flows in recent years and would grossly exaggerate the benefits of time savings when used for long term calculations³⁰.

3.3 In order to address the flaws in the appraisal process DfT commissioned research (TIEP)³¹ which showed that:

- Applying the same formula to all circumstances will not capture the economic benefits of all projects;
- Large projects may impact on private investment and employment which are not captured by the appraisal;
- Transport changes can impact on the spatial pattern of investment so land use changes should be reflected in the appraisal;
- Risks and uncertainties mean a wide range of future scenarios should be considered;
- The strategic and economic cases should be better integrated.

In recognition of these shortfalls in the appraisal HM Treasury has issued supplementary guidance to its Green Book³².

3.4 Alternative methods to capture the full economic impacts of a transport scheme are of four types (a) a survey based approach which estimates how changes in transport provision may impact on local businesses and economic performance; (b) modelling changes in land use that follow from the scheme (LUTI); (c) consideration of the impacts on connectivity which according to some evidence correlates with productivity and increased employment density; (d) Spatial Compatible General Equilibrium (S-CGE model) which attempts to provide a comprehensive coverage of the economy from firms and employees to households as consumers, suppliers of labour and providers of land and capital³³. All these methods have strengths and weaknesses and need to be further adapted and developed. The choice of which method to use depends on the specific questions that need to be addressed. Recent examples of these alternatives methods are below. They are complex and will require expert input to make them accessible to those not familiar with the assumptions and techniques.

3.5 The Airports Commission³⁴ used a dual approach applying both the webTAG 'welfare' assessment as the baseline and an additional Spatial Compatible General Equilibrium model which 'considers the impact from a GDP / GVA perspective at a macroeconomic level'. Critical experts³⁵ advised that building the economic case in this way was conceptually demanding. They welcomed the dual approach as logical and legitimate but queried whether it captured the final impact on the UK economy - the model itself had been well tested but increased capacity had been converted into an increase in trip making, trade, tourism and productivity. They counselled against attaching significant weight to the results. They also specifically challenged the credibility of the Treasury's economic growth forecast of 2.75% when the OECD in its latest Economic Outlook projected the growth of the UK GDP between 2014 and 2060 as no more than 2% pa.

30 <http://www.bettertransport.org.uk/campaigns/roads-to-nowhere/ltt-130412>

31 Transport Investment and economic performance, implications for project appraisal, Venables AJ et al, paper commissioned by DfT, 2014; Understanding and Valuing the Impacts of Transport Investment, Progress Report, DfT Dec 2014;

32 Valuing Infrastructure Spend: supplementary guidance to the Green Book, HMT, March 2015

33 Assessment of Methods for Modelling and Appraisal of Sub-national, Regional and Local Economy Impacts of Transport, DfT, 2013

34 Airports Commission Economy: Wider Economic Impacts Assessment

35 Airports Commission expert advisor note May 2015

3.6 In order to better understand the impacts that the Lower Thames Crossing between Chadwell and Gravesham could have on local communities and development Kent County Council developed a methodology based on how changes in connectivity to businesses and labour are related to productivity and business location decisions. The analysis separately modelled impacts of changes in connectivity on productivity and on employment and expressed the results using GVA. Using this methodology the Crossing is predicted to create 6,000 new jobs in North Kent and East Sussex, productivity benefits from agglomeration of ~£15million pa in 2021 and an overall GVA of around £334 million pa by 2021³⁶.

3.7 The proposed Lower Thames Crossing is also being used as a case study to explore the interdependencies between it and other local, regional and national infrastructure (both existing and planned)³⁷. An 'Interdependency Planning and Management Framework' is under development but there is insufficient evidence at this stage of the study to provide meaningful insights. However the study notes that the Lower Thames Crossing has been perceived as a transport problem which in itself influences the way in which the infrastructure is developed and the way in which interdependencies with other infrastructure are identified and valued. It begins to look at the impacts of the crossing on society, regeneration and environment in a holistic way and within a wider geography. Potential valuable interdependencies identified include using the crossing for energy generation, to carry utilities and for flood defence.

3.8 Even without all these new approaches, we have serious concerns about the appraisal of the Trans-Pennine tunnel using the standard WebTAG, due to the lack of up-to-date data and appropriate traffic and land use models for the Trans-Pennine Corridor. More evidence is required on who/what is travelling between Manchester and Sheffield. The Highways Agency's work on the Mottram Tintwistle Bypass in 2007 and more recently on the Trans-Pennine Routes Feasibility Study (2015) failed to provide up to date information for originations and destinations of travellers using these routes³⁸. Hence the nature of the traffic using the A628 corridor is unknown and cannot inform potential management of the Trans-Pennine routes. The importance of this is shown by the change in logistics use of the A628T. HGV numbers on the A628T have fallen from 2,347 AADT³⁹ (24% of the flow) in 2000 to 1,483 AADT (11% of the flow) in 2014. However, whilst overall traffic flows have remained the same vans have replaced the HGVs, increasing from 1,427 AADT (14% of the flow) in 2001 to 2,644 AADT (20% of the flow) in 2014. It is essential that the Tunnel Study understands the nature of the traffic using the A628T corridor. In addition traffic models which cover the full geographical area of the Trans-Pennine Corridor are required. The models used for both the Mottram Tintwistle Bypass and the Trans-Pennine Routes Feasibility Study only covered the western end of the corridor comprehensively. In the case of the Mottram Tintwistle bypass the modelling anomalies led to the collapse of the Highways Agency's case at the 2007 public inquiry. It is unacceptable for the Tunnel Study to adopt the same approach.

4. Where is employment situated?

4.1 The geography of jobs in the UK is changing. Employment, and particularly employment in high skilled, high paying occupations, is increasingly concentrated in the city centres of

36 The Lower Thames Crossing, 2010, KPMG

37 Identification of high level infrastructure interdependencies for the Lower Thames Crossing, commissioned by HMT and Infrastructure UK, ICIF, 2014

38 Friends of the Peak District Proof of Evidence 2 Mottram Tintwistle Bypass; Final Report for the 2014 Trans-Pennine Routes Feasibility Study, incorporating the Interim Note of 31st July 2014 Prepared by Keith Buchan, Director of MTRU, on behalf of the Friends of the Peak District

39 Annual Average Daily Traffic

our larger cities⁴⁰. This is true for both Manchester and Sheffield and has big implications for the role of transport in their economies. In order to support agglomeration in these cities, transport links within them must be improved in order to reduce the costs of commuting into their city centres⁴¹. Public transport is much less well developed in these cities compared to London, and given the shifting geography of jobs, this should be seen as a priority by both local and national government. Improvement of the existing rail links between Manchester and Leeds is also considered a priority, a recommendation based on the economic scale of these cities and the performance of the rail line that links them. Despite the number of knowledge-intensive business services (KIBS) jobs connected by this rail line, train speeds fall well short of the National Rail aspiration for such lines of at least 60 miles per hour.

5. Do people in the north want to commute long distances by car to work?

5.1 Travel to work distances depend on level of skills⁴². Unskilled workers in elementary and personal service occupations travel an average of 3km to work whilst their managers/senior officials travel an average of 7km. By contrast those in higher skilled occupations travel an average of 7km and their managers/senior officials travel an average of 18km to work. Thus any travel intervention to encourage long distance commuting would be likely to have the greatest benefit for those employed in Knowledge Intensive Business Services (KIBS).

5.2 Car desire lines in the Trans-Pennine Corridor showed that few made the journey from Sheffield (or Leeds) to Manchester⁴³. Recent traffic flows on the trans-Pennine roads in the table above indicate there continues to be little incentive (some would call it suppression) to travel across the Pennines by road, except on the M62, or rail. Rail improvements would improve speeds for travel-to-work distances. However even with road improvements commuting times would still be prolonged due to congestion and parking issues in the conurbations. Sheffield City Region anticipates severe delays on the radial strategic route networks into its urban centres with severe congestion by 2026⁴⁴.

5.3 Within South (and West) Yorkshire car commuting follows a dispersed pattern with only small numbers of trips ending in town or city centre, making it difficult to replace journeys with the current public transport system⁴⁵. In order to reverse this unsustainable self-reinforcing trend towards decentralized residential and employment locations use of the car would need to be substantially curtailed. This may be happening already through market forces e.g. the cost of owning and insuring a car has put it beyond the reach of many young people. The percentage of 17 to 20-year-olds with driving licences fell from 48% in the early 1990s to 36% in 2012⁴⁶. Road demand management measures and investment in alternatives to the car should be the priorities, with increasing road capacity the last resort.

5.4 Increased connectivity by road will be of little value to a significant proportion of residents in both cities who cannot commute by car - 31% of households in Greater Manchester and 33% of households in Sheffield do not have access to a car⁴⁷.

5.5 Both Manchester and Sheffield have a high degree of containment. Only 15% of people

40 Northern Powerhouse Fact Sheet, Centre for Cities, 2015

41 Fast Track to Growth, Centre for Cities, 2014

42 Fast Track to Growth, Centre for Cities, 2014

43 SEA of the TPC Fig 5.1, 1999; South and West Yorkshire Box Multimodal Study, MVA, 2002

44 Sheffield City Region Transport Strategy 2011-2026 BMBC, DMBC, RMBC, SCC, SYITA, SYPTE, SCR 2011

45 South and West Yorkshire Motorway Box Multi-Modal Study, MVA, 2002 working paper 7.3b

46 Statistical Release National Travel Survey 2012, DfT, revised 2013

47 GM Transport Strategy 2040 Our Vision, GMCA & GMLEP, 2015; 2011 Census

working in Manchester City Region travel in from elsewhere and in Sheffield 85% of residents live and work in the city taking 72% of its jobs⁴⁸.

5.6 Home working is increasing - 11.5% of people in employment in Yorkshire and the Humber and 12.1% of people in employment in the North West work from home⁴⁹. These figures have increased 0.9% and 1.8% respectively since 2008.

5.7 In line with some of the above, trip rates per person and distances travelled per trip have fallen over the long term⁵⁰. Trips made by private car have fallen 14% since 1995/97 whilst those made by public transport have risen by 2%. Walking trips have fallen by 27%.

6. How well connected are Manchester & Sheffield at present?

6.1 The most direct links are via the A57 and the Hope Valley rail line (see table below), followed by the A628, all of which cross the Peak District National Park. The road links are all compromised by their elevated topography, hazardous winter weather conditions, poor safety record (except the M62) and slow journey times. For rail the average speed line from Sheffield to Manchester is only 35mph while to Leeds and Nottingham it is 40mph. These links appear slow when compared with European examples of super-cities (see para above). However, since the journey by rail is already much quicker than that by road, and when improved⁵¹ would still be less than road journey times with a modelled 30 minute tunnel reduction, it would make sense to improve the rail corridor instead.

Route	Distance Km (Miles) between town halls (Google)	Time in mins (Google)	Annual Average Daily Traffic in Pennine section - (DfT)
A62/M62	123 km (77)	120	120,000
A628T ⁵² Woodhead	80km (50)	107	13,007
A57 Snake Pass	63km (39)	75	4,178
A635 Saddleworth	88km (55)	129	3,239
Hope Valley Rail		55	4,900 passengers/day

7. Is this tunnel only about connecting Manchester and Sheffield?

7.1 A fast all-weather route across the Pennines within a tunnel has long been promoted by Barnsley and Tameside, rather than Sheffield and Manchester City Regions. How such a link would help connectivity between Sheffield and Manchester depends on where the tunnel is created and where its portals lie. However, such a link could be envisaged to have much wider economic benefits by connecting two major UK ports - the Port of Liverpool and the Humber Ports - thereby impacting on trade benefits through imports and exports. The Trans-Pennine Corridor was considered one of the North European Trade Axes (NETA) fifteen years

48 City relationships: economic relationships in Northern city regions - Sheffield City region, Northern Way 2009; City relationships: economic relationships in Northern city regions - Manchester City region, Northern Way 2009

49 Home worker rates and levels by regions and countries of Great Britain Jan-Dec 2013 Office of National Statistics

50 Statistical Release National Travel Survey 2012, DfT, revised 2013

51 The Network Rail (Hope Valley Capacity) Order, Draft submitted to the SoSfT, 25th September 2015

52 None of the A roads featured in the top ten least reliable routes in the South Pennines (Route Based Strategy South Pennines Evidence Base Table 2.2)

ago but more recent maps do not show it - the north south routes from London now appear favoured.

8. What are Manchester City Region's connectivity aspirations?

8.1 Greater Manchester generates £48bn GVA, a 3.7% share of the national economy⁵³. However it is a cost centre to the UK requiring £22bn of public spending but only generating £17bn in taxes. It aims to close the £5bn gap and become a net contributor to the national economy. A quarter of the productivity gap between Greater Manchester and the UK is caused by higher than average levels of worklessness and low levels of economic activity. The other three quarters is caused by lower levels of economic outputs due to low skills levels⁵⁴. Investment in inter-city transport does not appear to be the solution to these ills. Nevertheless in order to address them, alongside other measures, Greater Manchester intends to improve connectivity nationally and internationally with the £560m Northern Hub rail scheme, the rail electrification programme, HS2 phase 2 and investment in Manchester Airport. It anticipated maximizing the efficiency of the highway network and establishing strategic freight interventions across all modes but it is now, through its vision for transport in 2040, actively promoting investment in Trans-Pennine motorways including smart motorways, new links to the M62J19, and 'improved routes'⁵⁵.

8.2 These aspirations create anomalies in Greater Manchester's Transport Strategy 2040 - the principles of sustainable travel and make best use of existing infrastructure are up against the aim to increase global connections and city-to-city links with new infrastructure. It recognises the detrimental impacts of road transport, but wants to increase commuting flows locally, regionally and across the north, and to increase road freight. High expectations now surround the Trans-Pennine route - global connectivity to three airports and the ports; city-to-city connectivity; and improved connectivity between local communities and to enable them to access jobs and services⁵⁶. The Vision relies on low emission technology and sustainable travel to reduce the impacts of traffic and increased travel. Environmental protection is addressed only through carbon emissions and air quality.

8.3 The map⁵⁷ below shows that if Manchester's commuters travelled the same average distance as those in London (indicated by the circle on the map) businesses in the city would have access to 1.5million graduates. But it also shows that:

- Those with highest qualifications (darker green) are not travelling city-to-city but rural-to-urban making radial not orbital journeys;
- Those with highest qualifications live in the highest quality rural environments & green belts - Cheshire, PDNP, south west Sheffield, west of Bradford, south Huddersfield, Penistone... They will not want them spoilt or built on... The same conflict is occurring between the Rondstad and its Green Heart;
- Cities in the Northern Powerhouse have significant 'white areas' of low qualified residents which need to be addressed - better inter-city connectivity could undermine the opportunities for these less well qualified residents;
- There are small concentrations of well-qualified residents in both Manchester & Sheffield city centres.

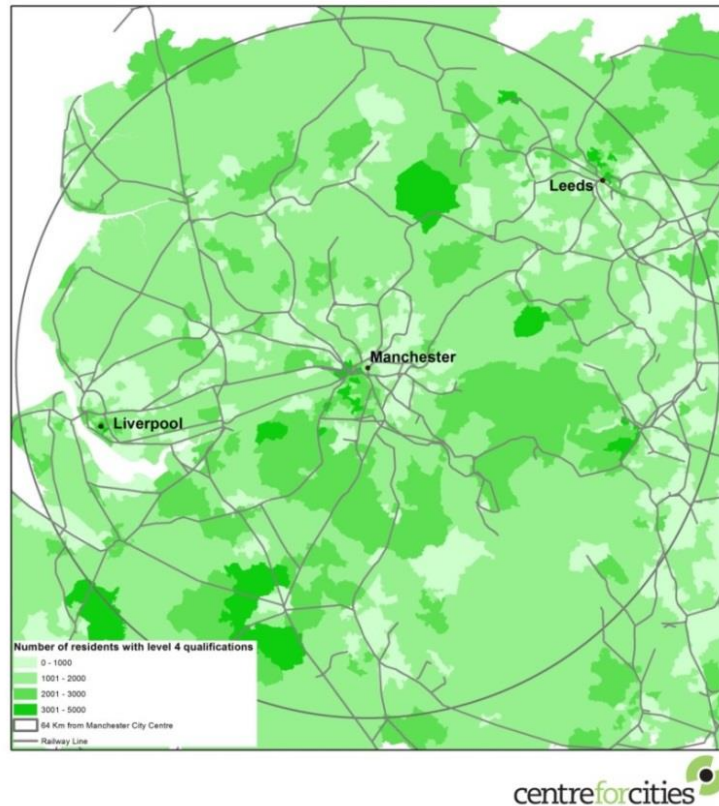
53 Northern Powerhouse Fact Sheet, Centre for Cities, 2015

54 Stronger Together Greater Manchester Economic Strategy, GMCA, AGMA, 2013

55 Greater Manchester Transport Strategy 2040 Our Vision, GMCA, GMLEP, 2015

56 Presentation to Trans-Pennine Study Stakeholder Group, Nicola Kane, TfGM, July 2015

57 <http://www.centreforcities.org/blog/how-to-build-a-northern-powerhouse/>



9. What are Sheffield's connectivity aspirations?

9.1 Sheffield City Region generates £20bn GVA, a 1.5% share of the national economy, but with a prosperity gap of £1.6bn⁵⁸ and similar productivity issues to Manchester. Improving connectivity is one of the measures proposed to close this prosperity gap. Sheffield aims to improve both intra-city region linkages and inter-city connections and key interchanges such as motorways, rail stations, airports and ports in a sustainable way. HS2 will reduce journey times between Sheffield, London and Leeds. The Northern Hub will bring faster journey times between Sheffield and Manchester.

9.2 In its transport strategy 2011-2026, also South Yorkshire's Third Local Transport Plan⁵⁹, Sheffield City Region's main Trans-Pennines aspiration focuses on rail - improved links to Manchester and access to Manchester Airport, improved speed, schedules, reliability and frequency of trains, and integrated ticketing. There is no mention of specific improved road links - only of reducing the productive time lost on, and improving the reliability and resilience of, the generally 'mature and comprehensive' strategic road network. With respect to the A628/A616 the aspiration is to work with the Highways England to keep the route open during extreme weather.

9.3 Sheffield, the Northern Way⁶⁰ suggested, could strengthen its relationship with Manchester and Leeds in order to improve business links and offer a larger pool of career

58 Bigger Economy Better Business Faster Growth, Sheffield City Region Economic Strategy, 2020 Vision, 2013

59 Sheffield City Region Transport Strategy 2011-2026 & South Yorkshire Local Transport Plan 3 Implementation Plan 2011-2015, BMBC, DMBC, RMBC, SCC, SYITA, SYPTE, SCR 2011

60 City relationships: Economic linkages in northern city regions - Sheffield City Region Northern Way 2009

opportunities to help attract and retain highly skilled workers. However improving transport links to Manchester and Leeds is only one of achieving this; improving the quality of life and the housing offer for graduates is another. By contrast the independent economy of Manchester did not, nor was it advised to, look east across the Pennines to make better links with Sheffield⁶¹.

10. Are there agglomeration and other employment benefits to be gained by improving connectivity between Manchester and Sheffield?

10.1 Links between businesses increase trade, allow sharing of ideas and reduce costs. However, the strength of agglomeration diminishes with distance⁶² and there needs to be an effective density in both cities of the relevant industry - the higher the effective density the higher the output of the two economies.

10.2 Currently there are limited labour markets *between* the two cities with negligible levels of commuting between them⁶³ - only 0.4% of Sheffield residents commute to work in Manchester. The table below shows the industrial structure of the two cities on a percentage basis⁶⁴. Sheffield remains dominated by the public services sector and lags behind Manchester in the KIBS. With a higher proportion of its workforce employed in finance, IT and business services Manchester is apparently more sensitive to agglomeration impacts than Sheffield⁶⁵.

Sector	Manchester	Sheffield
KIBS	17.78%	13.61%
Manufacturing	7.43%	10.19%
Other private services	42.84%	38%
Other sectors	5.6%	5.24%
Public services	26.35%	32.96%
	100%	100%

10.3 The wider economic benefits of the Mottram Tintwistle Bypass (2007) were assessed based on a regeneration area covering South Yorkshire, part of High Peak, Tameside, Manchester, Oldham and Stockport. A total of 2,800 new jobs was predicted which was considered to be 'a very small proportion of job numbers in the wider area'⁶⁶. A more recent economic study (2012)⁶⁷ to determine the potential economic impact and hence increased GVA of an improved Trans-Pennine link found that if journey times between Manchester and Sheffield were reduced by 15 minutes the combined economic benefits would be £47.7million one year after opening (Transport Economy Efficiency benefits - £37.46million; Agglomeration benefits - £9.05million; Imperfect Competition Impact - £1.19 million). The total 60 year benefits would be £1.1bn.

10.4 At present the A628 corridor links Tameside and Barnsley rather than Manchester and Sheffield. What has Barnsley got to offer Manchester, or Tameside and Barnsley to offer each other? With strong economic links to West Yorkshire Barnsley instead forms part of both the Leeds and Sheffield City Regions; if measures to support economic activity in Barnsley are

61 City relationships: Economic linkages in northern city regions - Manchester City Region Northern Way 2009

62 webTAG 3.5.14; 7.4

63 Northern Powerhouse Fact Sheet, Centre for Cities, 2015

64 <http://www.centreforcities.org/city/>

65 Trans-Pennine Connectivity, prepared by URS for Derbyshire County Council 2012

66 A57/A628 Mottram Tintwistle Bypass A628/A616 Route Restraint Measures, Proof of evidence HA/TSE/10/2A Traffic Safety and Economics, Highways Agency 2007

67 Trans-Pennine Connectivity, prepared by URS for Derbyshire County Council 2012

desirable then that suggests the alternative of testing the benefits of improving a Leeds-Sheffield connectivity corridor.

11. Could the Northern Powerhouse mimic the success of the Randstad and the Rhine-Rhur Metropolitan region⁶⁸?

11.1 The Randstad consists of four Dutch cities - Amsterdam, Rotterdam, The Hague and Utrecht - with 8 million people arranged in a square of 8,287 km² around the Green Heart (peat lowlands). Intercity distances vary from 23km (The Hague to Rotterdam) to 75km (Amsterdam to The Hague), with no more than 30-50 minute journeys by rail and 35-64 minute journeys by road between them. By contrast the spatial characteristics of the Transport for North area are considerably different - see paragraph 11.3 below. For all the cycling that the Dutch do, the motorways between the cities have recently been improved from 2-3 lanes to 6-8 and in some situations 10 lanes!

11.2 The Rhine-Rhur Metropolitan region consists of 5 major German cities - Koln, Dusseldorf, Duisberg, Essen and Dortmund - clustered in a lowland crescent along the Rhine and the Rhur. The region has a population of 11 million and covers 9,759km². The area spans 130km (81 miles) from north to south with distances between cities varying from 44km (Koln to Dusseldorf) to 94 km (Koln to Dortmund), and has the densest network of autobahns (6 lanes) in Germany. It has two international airports and two large industrial inland ports. Although the region provides 15% of Germany's GDP it lacks international competitiveness - it fails to present itself as a unified region. Cities and urban areas pursue separate investment policies and compete against each other. More recently (2010) there was a substantial rise in unemployment in the region to 8.7%.

11.3 The Northern Powerhouse consists of six cities (Liverpool, Manchester, Leeds, Sheffield, Hull and the Humber, and Newcastle) with a population of 10.7 million. By contrast to the Randstad these cities are widely spaced within the Trans-Pennine Corridor stretching coast to coast over a distance of 230km (144 miles), with Newcastle geographically quite separate from them. Distances between cities in the Northern Powerhouse are all longer than those in the Randstad and vary from 54km (Liverpool to Manchester) to 284km (Liverpool to Newcastle). Furthermore, the Randstad does not have a separate capital city like London with which to compete - although Amsterdam is the constitutional capital The Hague is the seat of government - and Germany is a polycentric economy with the Rhine-Rhur region only one of several economic centres. Although the Pennines and in particular the Peak District act as an equivalent green space to the Dutch Green Heart, they are peat uplands with adverse weather and present challenging travel conditions between each of the cities.

11.4 Finally, it is not clear that the benefits of a more economically integrated Northern Powerhouse will be evenly distributed. At present Manchester is steaming ahead to become the first devolved combined authority with substantial new powers leaving the other five cities behind, and its recent spatial and transport strategies reflect a spatial ambition which are not matched to the east of the Pennines. Co-operation between regional players and between them and national Government has diminished since the abolition of the Regional Development Agencies and their partial replacement with Local Enterprise Partnerships⁶⁹.

68 All facts from Wikipedia

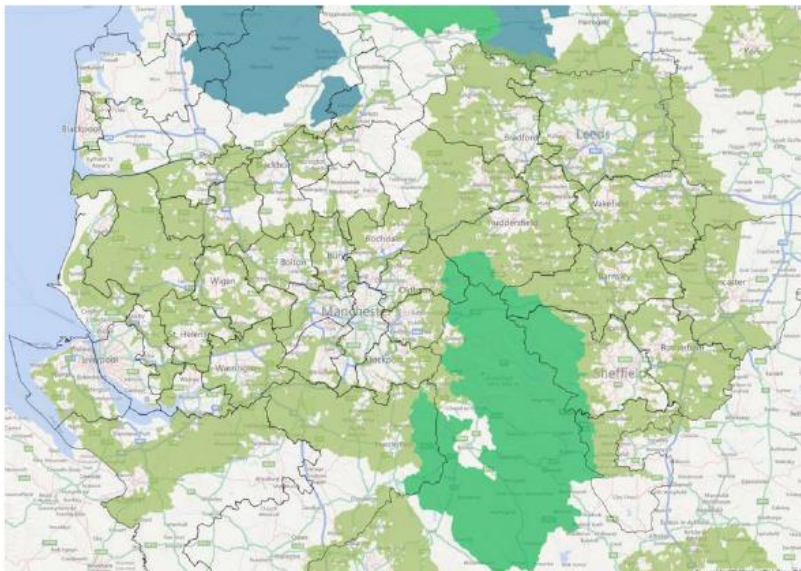
69 House of Commons Transport Select Committee Strategic River Crossings 10th Report 2014-15 sessions, para 27, March 2015

12. What is the economic value of the high quality most protected countryside between Manchester and Sheffield?

12.1 All of the National Parks and AONBs in England have a combined GVA worth more than £20bn, similar to that of Birmingham⁷⁰. Two hundred and sixty million people visit them annually spending in excess of £6bn and supporting thousands of jobs and businesses. The Northern Powerhouse has five National Parks - Peak District, Yorkshire Dales, Lake District, North York Moors and Northumberland - and seven AONBs - Solway Coast, Northumberland Coast, North Pennines, Arnside and Silverdale, Forest of Bowland, Nidderdale and the Howardian Hills - within its geography and they cover a substantial area.

12.2 Yorkshire and Humber, the English region with the highest proportion of its land designated as National Park, has three National Parks - Yorkshire Dales, North York Moors and part of the Peak District. Together they sustain sales by businesses in the Parks worth £1.8 billion annually, supporting over 34,000 jobs and generating visitor expenditure estimated to be almost £1 billion and supporting a further 12,000 jobs outside the Parks⁷¹. In between Manchester and Sheffield the Peak District National Park alone has an economy whose businesses in 2012 generated a turnover of £1.1bn with a GVA of between £406-568million. The majority of businesses in the Parks believe that the quality of the landscape and environment is important to their business performance.

12.3 The focus of the Northern Powerhouse is on city-to-city links without recognition of the economic value of the high quality environments in the north, not only the National Parks and AONBs but also the wider countryside and green belts, which are locally important and distinctive. The direct financial benefits quoted above take no account of the Parks' full 'economic' value through the ecosystem services that they provide such as clean water, carbon storage and flood defence to residents of the Greater Manchester, Leeds and Sheffield city regions. These landscapes also provide qualitative benefits that are not valued using conventional GVA methods. How will the Tunnel Study capture these benefits and the wider economic impacts of the North's countryside? In order to promote these issues to the Northern Powerhouse CPRE is proposing the concept of the 'Northern Metropolitan Countryside' (see diagram below).



70 So much more than the view, NAAONBs and National Parks England 2015

71 Prosperity and Protection, 2006, CNP

13. What are the wider environmental impacts of connectivity?

13.1 At present, the environmental costs of the adverse traffic impacts (congestion, air pollution, carbon emissions) between Greater Manchester and South Yorkshire are not being paid for at source. Proposed capacity increases to the highway infrastructure would permit, indeed encourage, traffic growth that would increase the existing environmental costs to the economy. Either the costs of these transport impacts have to be paid for through pricing mechanisms or, if that is not politically possible, the impacts themselves must be mitigated through traffic restraint measures, as was shown by a Strategic Environmental Assessment (SEA) of the Trans-Pennine Corridor⁷².

13.2 The SEA of the Trans-Pennine Corridor extending from coast to coast across the whole of the north of England was commissioned to assess all routes, road and rail, in a braided approach, and to consider present and future problems, and alternative strategies and their potential impacts. The agreed objectives were to protect and enhance the environment; to promote safety; to promote adequate accessibility; and to promote the economic efficiency of transport and the efficiency of economic activities. It concluded that across the Trans-Pennine Corridor investing in public transport, road traffic reduction measures and centralisation of land use development would give a protected and enhanced environment, improved safety and accessibility whilst producing economic and financial benefits. Considering the scope of the Northern Powerhouse, the results of the SEA of the Trans-Pennine Corridor are extremely relevant.

14. What about climate change?

14.1 Under the Climate Change Act 2008 targets were set to reduce UK greenhouse gas emissions by at least 80% below 1990 levels by 2050. Currently the UK appears on track to achieve its 2020 target to reduce carbon emissions and the transport sector has contributed to this over recent years⁷³ - transport emissions fell by 1.1% in 2013 due to falling carbon intensity of cars and vans⁷⁴ although fuel sales imply that emissions are likely to increase by around 1% in 2014, as rising demand outweighs carbon intensity improvements. However, transport's overall contribution to carbon emissions continues to rise, from 22% in 2000 to 25% in 2013, as other sectors prove more effective in reducing their contribution. Projected emissions reductions from current policies fall short of the UK's cost-effective trajectory and further measures will be needed to meet future carbon budgets, including continued improvement in fuel efficiency for conventional vehicles, switching to alternatively fuelled vehicles and changing travel behaviour.

14.2 The Trans-Pennine Corridor is an air pollution corridor and both Greater Manchester and Sheffield experience poor air quality⁷⁵. There is an urgent need to cut NOx and particulates emissions in order to meet EU limits and stop the well-evidenced serious detrimental impacts on health in both cities.

14.3 Greater Manchester is committed to a 48% reduction in carbon by 2020 from 1990 levels⁷⁶. Transport currently accounts for 30% of these emissions and of these 95% are from road vehicles. It is relying on low emission vehicles to reduce these and air pollution, with zero emission vehicles the norm by 2040.

72 SEA of the TPC Summary of Options Report, July 1999

73 2013 UK Greenhouse Gas Emissions Provisional Figures, DECC, 2014

74 <https://www.theccc.org.uk/charts-data/ukemissions-by-sector/transport/>

75 2015 Air Quality Action Plan Progress Report for Barnsley Metropolitan Council;

<http://www.tameside.gov.uk/airquality/assessment> ;

<https://www.sheffield.gov.uk/environment/air-quality/management.html> ;

76 Greater Manchester Transport Strategy 2040 Our Vision, GMCA, GMLEP, 2015

14.4 Sheffield City Region aims to reduce carbon emissions by 30% below 2010 levels by 2020 and by 60% below by 2050⁷⁷. The main contributor to carbon emissions and air pollution from transport is the trunk road network. To address these Sheffield aims to reduce vehicles on the road and the total distance travelled by locating new development close to existing services and public transport corridors. As well as ensuring people can make informed travel choices, it will rely on improved vehicle efficiency and using energy from renewable sources.

14.5 Given these targets the Trans-Pennine Tunnel study will need to explain in detail how the project will remain compatible with these targets.

15. What about freight?

15.1 Improvements to the North's freight network are to be investigated by TfN through a multi-modal Northern Freight Strategy⁷⁸, due to be published in 2016. To ensure that the North's road network supports effective movement of freight, TfN is seeking a number of road upgrades including to the M62, M60, A160/A180 to Immingham and the A1M near Doncaster, Trans-Pennine tunnelling and dualling of the A66 or the A69. (DfT and Highways England are currently considering improvements to A66 and/or A69 between A1 and M6 through the Northern Trans-Pennine Strategic Study.) On the railway it is seeking longer trains, strategic rail freight interchanges where there are gaps, and the right gauge in the right place, particularly to enable transport of deep sea containers.

Anne Robinson
CPRE South Yorkshire & Friends of the Peak District
July 2015
with contributions from Anthony Rae, FOE

77 Sheffield City Region Transport Strategy 2011-2026 & South Yorkshire Local Transport Plan 3 Implementation Plan 2011-2015, BMBC, DMBC, RMBC, SCC, SYITA, SYPTE, SCR 2011

78 The Northern Powerhouse: One Agenda One Economy One North, TfN, March 2015