



HS3

A More Socially and Economically Inclusive Alternative to HS2:

Bridging the North-South divide through increased connectivity of Northern cities

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Methodology

The Justification of Secondary Data Usage

In this report, the use of secondary research and data sources was prominent. This is primarily a result of our project being based upon hypothetical developmental models and theory, a lack therefore of tangible empirical data that can be gathered and quantified, we instead drew upon reliable secondary data, derived from case study material, that had already been obtained by professional researchers in the field. There were also concerns that primary data, attained through surveys, may be tainted in its reliability due to a small quantity of participants of whom would have a limited knowledge of complex theorised developmental models. Therefore, a survey may not be accurate nor statistically representative of the impacted population, which in turn may result in a high percentage of statistical errors. Thus, relying on already existing data and theories from scholars in the field seemed like the most appropriate way of building this report's theoretical argument.

Introduction

Transportation has inevitable consequences on the social, economic and environmental aspects of one society. In fact, although useful in many circumstances, transport could actually lead to social and economic exclusion in certain contexts. HS2, the most prominent form of transport in the UK in current debates, acts as a case study that proves the importance of transport in socio-economic debates. While some might argue that HS2 will improve connectivity and is a step forward in pursuing economic development, others would argue that risks of gentrification will possibly arise, and that they hold within them serious threats to social equalities in one society. Therefore the Northern Powerhouse is another form of potential transport in the literature, claiming that connecting the North is the most essential form of transport when trying to rectify the North-South socio-economic divides. In other words, introducing HS3, which primarily focuses on connecting the North with the South through transportation as a means of better economic and social equality, thus; leading to an overall economic development in the UK.

Social and Economic Exclusion as a Result of Transport

Levitas et al. (2007) have identified social exclusion as:

'... the lack or denial of resources, rights, goods and services, and the inability to participate in the normal relationships and activities, available to the majority of people in a society, whether in economic, social, cultural or political arenas. It affects both the quality of life of individuals and the equity and cohesion of society as a whole' (...).

The problem of social exclusion in transport is multi-dimensional as it is either as a result of the circumstances of the individual, or the institutions and structures within the wider society, which makes social exclusion in transport a particularly hard problem to address. With the individual, social and economic exclusion as a result of transport can affect their ability to interact and participate in the society. This results in social exclusion being very dynamic in nature; meaning that in policy terms, the concept requires a focus on the socio-economic outcomes, as well as the experience of disadvantage itself (Lucas 2012). Therefore, when considering transport and high speed rail it is important to understand that it is the abilities, skills, resources, capacities, and past experiences of effected individuals that should be considered when trying to address social exclusion. Documents written on the research of the phenomenon (Wachs and Kumagai, 1973) show that it is not the fact that there is no transport available, and not necessarily the speed or capacity of the trains, but rather the consequences of this in terms of their inability to access key life-enhancing opportunities, such as employment, education, health, and social networks.

Mobility Disadvantage:

Transport has a very important role in determining social and economic outcomes for different sectors of society in terms of absence of adequate transport services and the impact of the transport system of individuals and communities. Kenyon et al (2003:210) provide a really useful definition which stresses the impact of immobility on the transport disadvantaged.

'[It is] the process by which people are prevented from participating in the economic, political and social life of the community because of reduced accessibility to opportunities, services and social networks, due in whole or part to insufficient mobility in a society and environment built around the assumption of high mobility'

This definition stands particularly true in small, hyper-mobile countries such as the UK and most European countries. It shows that by increasing the speed, capacity or frequency of trains in the UK does nothing to address the mobility disadvantages, and thus, fails to address many social or economic problems related to transport in the UK.

Randstad et al (2000) show the realities and possibilities of job access in highly urbanised places (their example is the Netherlands), and it can be applied very easily to the North of England, as the proximity and population of Northern English cities is very similar to those in the Netherlands. In the middle of Randstad's argument lies the "Green Heart", from where the most jobs should be available with a certain amount of commuting time. Although such a study has not been conducted in the UK, we believe that the North of England shows enough similarities in order to use such a case study; In 15 minutes 6000 jobs can be accessed either by train or car, while in 45 minutes, 19 million are available. Regardless of the exact numbers, it is obvious that only a half an hour increase in commute time can greatly affect the accessibility and quality of jobs, education, and health care. The effects of bad accessibility are explained by the problem of the "low skills equilibrium". Employers find it difficult to find highly skilled employees with high commuting tolerance, thus they demand less and have lower output. Appropriately, people in the area don't seek to enhance their skills, leaving the local economy at a low point. East Lindsey needs better quality roads and more efficient public transport, so people wouldn't be reliant on cars.

Transport Appraisal:

When planning transport infrastructure, the government often analyses the economic and environmental impact of sustainability, however social appraisal is something that is often left out. Social impacts of transport are defined as “changes in transport sources that (might) positively or negatively influence the preferences, well-being, behaviour or perception of individuals, groups, social categories and society in general (in the future).” Geurs et al. (2009), and in their study they present a suggested approach to policy intervention and a way of perceiving the social effects of transport: Figure 2 presents the analysing process of the chain of impacts with special attention to differences between social groups.

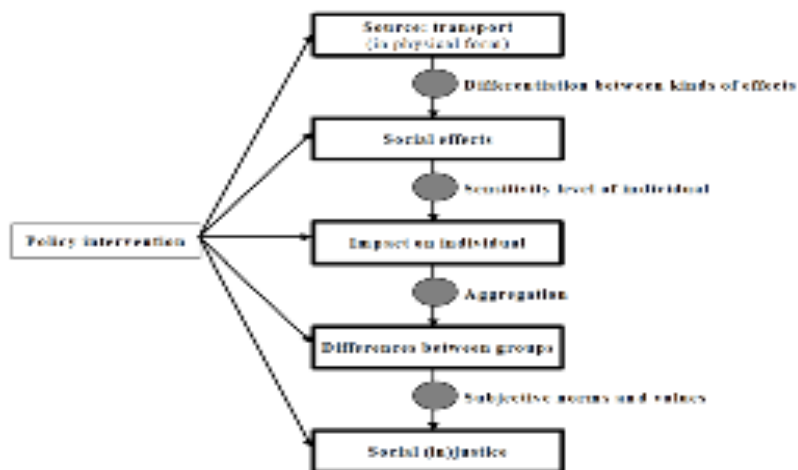


Figure 1. Specification of the source-effect-impact-receptor chain for social impacts of transport: the receptor part consisting of 'impact on individual', 'differences between groups' and 'social (in)justice'

Figure 1: Importance of including social politics when introducing policy interventions (K.T Geurs et al, 2009)

This diagram shows the importance of including social policies when introducing policy intervention. 1) “Source: transport” suggests the importance of being aware of the physical effects of the existence and use of transport. For example, congestion creation, or noise pollution. 2) “Social effects” is the importance to understand how transport policy or infrastructure projects may change preferences, behaviour, or perception of society, social categories and groups. For example, air pollution could change the way people

perceive a neighbourhood. 3) "Impact on individuals" suggests that wider social effects can be reduced to the individual level. With this, it is important to distinguish between effects and impacts. Individuals have their own sensitivity levels with respect to social effects, and when an effect exceeds this level then it becomes an impact to these individuals (Lichfield, 1996). For example, some sensitivity levels are subjective, such as air pollution, and some are more objective, such as noise. (4) "Difference between groups" is important for policy intervention because identifiable groups of individuals can serve as units of analysis, since groups are easier to target through policy measures than individuals. Effects can be distributed across space, time and over social groups. Population groups are often distinguished by three indicators: social differences (for instance, gender and age), economic differences (income) and spatial differences (geographical) (Jones, 2001; Litman, 2002). (5) "Social (in)justice" shows that it is important to know that if social differences are unacceptable according to the values and standards of society, they are labelled a social injustice, which is a subjective and often political decision. Applications of different theories of social justice result in a different distribution of the net benefits to socio-economic groups and, thus, result in different conclusions (Khisty, 1996; PROPOLIS, 2003). When all five sections are considered and thoughtfully mitigated, only then can transport appraisal truly address social problems.

Making the Case for HS2

The Importance of Connectivity and Transport in the Pursuit of Economic Development

A well-connected transport system generates a robust and a competitive economy, as transport is as vital as the heart for the human body transport is key for the growth and development of a nation.(Egert. B, Kozluk. T and Sutherland. D, 2009) As the population of Britain is expected be around 10 million more in 2035, the need for an easy flow of

national transport and nationwide connectivity will only intensify, just as it has been evident during the past couple of decades. Infrastructure is a catalyst of economic and social development and Britain is in need of a catalyst more than ever for its future prosperity (Lord Heseltine of Thenford CH, 2012), especially since the growth rate of the population and the demand for convenient, quick and safe travel has increased, thus justifying the need for a state of the art transport system, arguably being the economy's much-needed boost (The National Infrastructure Plan, 2015).

HS2: There Is No Alternative

Potential solutions ranging from different modes of transport to various upgrades to the current transport system have been extensively considered. However, no other alternative to HS2 which delivers that level of connectivity that is required for exponential growth over the years ahead. Domestic aviation has greater environment implications in contrast to HSR, due to its greater carbon emissions (Gleave.S.D, 2009), while road travel cannot provide the connectivity of a high-speed link between cities due to road congestion, and thus has insufficient capacity necessary to ignite the North's economic growth (Department of Transport, 2013).

Reducing Disruption

One must also acknowledge that HS2 will create far less disruption, but also the fact that at present much greater levels of investment are being channeled into existing rail and roads (Department of Transport, 2011), thus justifying the financial outlay of HS2. Options such as longer platforms having been considered, yet disregarded due to the extended rail closures and disruptions that would have been incurred. Therefore, HS2 is unrivalled in its suitability to address the country's flaws in transport infrastructure.

Addressing Increasing Pressures on Rail Capacity

Since the mid 1990's long distance rail travel has doubled and has since continued to grow, having increased to 1.5 billion in just over 15 years, (Office of Rail Regulation). In the future, North-South links will be the most exposed to future pressures of increased demand for connectivity, being among the most important transport routes, transport that allows fast and dependable travel between cities is a necessity. However, the West coast main line is hugely overwhelmed, with insufficient capacity to accommodate more trains. Even after the £9 billion upgrade in 2008, the train operators cannot run all the direct services because there simply isn't enough space, creating unreliability and less punctuality due busier trains, (Atkins, 2013).

Increasing Rail Capacity is Imperative for the Country's Economic Growth

HS2 will enhance the nation wide rail network by providing the rail capacity necessary for Britain's economic prosperity. Providing efficient services with high capacities between London, Leeds, Manchester will hugely increase the number of seats available between London and Birmingham. Moreover, HS2's integration with the existing railways will also allow for faster direct trains to cities such as Liverpool, Newcastle, Glasgow and Edinburgh. Estimates predict that 100 cities and towns will benefit from HS2, as well as 18 of Britain's cities becoming better connected. HS2 provides unprecedented innovation within Britain's transportation infrastructure, having the capacity to transport 300,000 passengers each day, thus cutting down connection times with airports while also easing congestion on vital roads.



Figure 2: Illustrating the reduced journey times from Birmingham to London. ()

Moreover, HS2 will free up space on preexisting lines, thus being to the benefit of businesses, allowing for more freight to be transported between Northern and Southern cities, thus making the North competitive within the manufacturing industries. This will also be to the benefit of passengers, increasing rail capacity for regional and commuter trains. HS2 will be the backbone of creating regeneration where it is needed, supporting the creation of homes and long term jobs, thus ultimately unlocking the potential of undervalued regions. Therefore, regardless of whether an individual uses HS2, thus reaping the benefits of reduced commuting times, but the benefits will be evident within the country's economy and infrastructure

The Economic Case for HS2

One may also justify the cost of the financial outlay, and argue that it is a sustainable form of expenditure as it can be spread over 18 years at less than 0.17% of its GDP, (The Strategic Case for HS2). Moreover, HS2 can boost the economy by £15billion each year, (KPMG), and make a return of £2 for every pound invested. It will also open up new markets within the midlands and the North with its enhanced and transformed connectivity. HS2 promises to deliver 400,000 jobs (The Core Cities Group) and generate 100,000 jobs in the West midlands alone, (Solihul Metropolitan Council & Arup).

HS2: Crucial for National and Northern Economic growth

A state of the art railway, enhanced through its integration with existing networks is the only solution that can provide Britain with the levels connectivity and capacity required for not only invigorating the economy, but bridging the North South divide, thus a project considered a major asset to the entire nation. HS2 will economically empower the North, thus redistributing wealth, support businesses, create homes and employment opportunities, as well armouring the North with the means necessary to economically rival not just the South on a national level, but also within the international arena.

HS2: The Risks of Gentrification

Gentrification Risks Undermining HS2 and Exacerbating Social Inequalities

Hamnett (1991) defines gentrification as “a new phase in the structuring of an urban space, a reflection in space of economic structuring” (Simon, P. 2008:210), comparable therefore to the government’s desire to economically restructure the country, economically invigorating the North with the desire to bridge the North-South divide.

The increased connectivity provided by phase one of HS2 effectively extends London’s sphere of influence. This increases the viability of the North as a potentially lucrative investment opportunity in the minds of individuals, as households are attracted to the North’s comparatively lower living costs, having been spurned by the South’s overheated property market. Academics adopt the view that “gentrifiers comprise a new social group - even more a ‘new class’ according to Ley (1996)” (Simon, P. 2008:212). It is the economic superiority of this ‘new class’ that is socially detrimental. Increased demand for residential property, alongside the rising popularity of middle class characteristics raises the costs of living to levels unattainable for Northern communities. In light of its post industrial urban decline, preexisting Northern residents are resigned to lower wage, predominantly public sector employment, thus unable to rival this ‘new class’, and subsequently marginalised to more affordable peripheral regions, leading to a polarisation of the social classes.

Is Gentrification A Necessary Evil of Economic Development?

The Dangers of Gentrification

Some uphold the view that gentrification is merely a passive “product of the shift from an industrial to a post-industrial society” (Simon, P. 2008:215), perceiving it as an inevitable part of the North’s socio-economic development. Upholding a narrow two dimensional perception of gentrification and its social ramifications, acknowledging it solely in its economic context, the government fail to consider the social implications upon the Northern working classes. Such thought is founded by Patterson et al.’s observations, derived from studies upon the effects of investment in transport infrastructure on the gentrification of Canadian cities, whereby it is stated that “public investments, such as transit infrastructure [could have] adverse effects, especially on poorer communities” (Patterson, 2014). The study expands further, noting the potential “harmful effects, which may include rising costs of living for existing residents, conflicts within communities and even displacement”(Patterson, 2014). This corroborates with Patterson et al.’s indicators of gentrification:

“Full list of indicators used in the identification of the onset of gentrification included:

- average monthly rent
- proportion of people in professional occupations
 - percentage of owner-occupied dwellings
 - average family income
- number of degrees per capita” (Patterson, 2014).

The argument for HS2 upheld by the government therefore, founded on the desire to bridge the economic and social disparity between the North and South, may be contested, on the grounds of its failure to note the dangers of gentrification upon the North. The following section of the report therefore will highlight the flaws in HS2 by drawing upon case study material, illustrating the link between HSR and gentrification as well as its associated social consequences.

Establishing The Relationship Between High Speed Rail (HSR) and Gentrification

In order to justify concerns regarding HS2's risk of gentrifying Northern cities, one must draw upon evidence to establish a concrete link between the two. Therefore, the report will initially focus upon studies carried out in Toronto and Montreal, where it was observed post the construction of HSR that there was a "positive relationship between transit exposure and gentrification" (Patterson, 2014), suggesting that the increased transit exposure created by HS2 may well lead to gentrification. The link between HSR and gentrification is reaffirmed, stating that the "proximity to rail transit ha[s] a statistically significant effect on gentrification"(Patterson, 2014). Therefore, the very connectivity acclaimed to economically boost the North, will have unknown and unmitigated against social ramifications upon preexisting communities. Moreover, the study drew upon development models, concluding with indisputable evidence that "results show[ed] statistically significant and positive relationships between exposure to urban rail transit stations and the likelihood that it undergoes gentrification" (Patterson, 2014). The lack of concern regarding the evident risk of gentrification suggests that the modelling of HS2 has been ill-thought out and the motivations blindly economical.

Gentrification and HS2: Negating The Very Social Inequalities That It Intends to Resolve

The arguments for HS2, endorsed by the government, are misinformed having been founded on the pretence that it will foster social cohesion and reduce the social inequalities that disproportionately burden the North. One encounters the dangerous preconception that the economic prosperity generated by development projects is seemingly synonymous with equally distributed reductions in social inequalities. However, improved economic figures can shield the paradoxical social effects that development projects, such as HS2, have on communities. There are fears that while HS2 will lead to improvements in social structure with regard to the emergence of a new Northern middle class, this will come at the risk of further marginalising and burdening the working classes, thus witnessing a "widening gap between affluent and poor areas" (Simon, 2008:210) , one draws upon "evidence that cities have encountered a new phase in the spread of inequalities: dual city, global city, or divided city" (Simon, 2008:210). This would

largely be a consequence of higher living costs, incurred due to rising rents catalysed by gentrification occurring at the city centres where HS2 and points of connectivity are in closest proximity. This spatial segregation is acknowledged by Ortega (2012) who notes that “HSR implies a risk of spatial polarisation” (Ortega, 2012) (, reinforced by drawing upon the Galician HSR Corridor, which “suffers from a somewhat polarised spatial distribution of population” (Ortega, 2012). One can analyse the link between spatial segregation and economic prosperity, viewing a physical separation of the classes “as an indication [of] the relationship between space structures and socio-economic inequalities...or, as Park et al. (1925) put it, is a reflection of the social projection of social relationships on space” (Simon, 2008:210).

HS2: Exacerbating Social Inequalities and Disharmony

The consequences of spatial polarisation were witnessed in the Parisian borough of Belleville during the construction of HS1, and thus one may draw comparison to HS2. As reflected in Toronto, “increases in rents [resulting in the] displacement of existing residents” (Patterson, 2014), coercing working classes into relocating to more affordable, peripheral regions, one encounters the very real danger of creating ‘quasi-communities’ or ‘micro-environments’. This was witnessed in Belleville, which evolved to become “a socially isolated area with a strong sense of its own identity [as a consequence of] working class neighborhoods...[being] evicted from the centre of Paris” (Simon, 2008:218). Thus one witnesses the counter productive and paradoxical effects of schemes designed to heighten socioeconomic prosperity at the expense of exacerbating social inequalities. Therefore, one may make the point that as opposed to homogenising the social classes, and bridging the North-South divide, the gentrification incurred by HS2 risks sabotaging all efforts to lessen unjustified inequalities imposed on the North.

The Northern Powerhouse

The 2016 Northern Powerhouse Independent Economic Review (NPIER), commissioned by the NfP sets the goal for the North, and the means to achieve it. The main causes of the North-South economic divide were determined as a result of: a lack of skilled workers and innovation, low levels of investment and enterprise, as well as insufficient transport.

Transport

The Importance of Different Scales of Transport

It is believed that the creation of a widespread agglomeration by improving connectivity would enhance improvement in other areas by attracting and retaining both a qualified work-force and businesses. Therefore Northern Powerhouse Rail (linking Liverpool-Manchester-Leeds-Sheffield-Hull-Newcastle), the additional motorway improvements (including important Trans-Pennine links between Manchester and Sheffield) are vital to the success of the Northern Powerhouse. Furthermore, in order to affirm the North as a viable international competitor, international connections are vital, hence the integration of ports and airports in Liverpool, Manchester and Newcastle. Such connections can bring a great amount of investment and tourists, alongside with acting as a gateway for British businesses. The connections need to be affordable, regular, accessible and easy to use, thus, technology like a Pay As You Go (PAYG) model across the North would significantly increase effectiveness, as it has already been introduced in London (The Northern Powerhouse Partnership, 2017). Historically, the North has progressively relied upon its natural sources and once again, it needs to capitalise on its assets, such as its energy resources and ports.

International Competitiveness

Transport has a significant role in connecting skilled workers of a certain industry with universities with research capabilities and helping in the creation of competitive- sized companies. Since the Northern Powerhouse concept was introduced and accepted, the amount of Foreign Direct Investment (FDI) projects has increased significantly and has shown potential for further expansion (UK Department for international Trade, 2016).

Areas of expertise

The areas where internationally competitive firms already exist have been identified – the NPIER's prime and enabling capabilities – and individual cities are capitalising on them. Such areas of expertise are: advanced manufacturing, energy, health innovation and digital engineering.

Firstly, since the region is home to several research centres (Sheffield, Sunderland), the scholarly background for advanced manufacturing is accessible. There is also an increasing demand for the manufacturing industry within the UK, requiring further research, as a result of a rising consciousness for the environment.

Secondly, the Leeds city region is one of the UK's key energy suppliers. There have already been achievements in generating wind and nuclear energy, as well as in manufacturing equipment.

The North has the suitable capabilities to focus on health innovation, as it possesses adequate data processing, robotic and synthetic biology advances and the necessary materials.

Lastly, the region has a history in digital innovation, particularly Manchester. There are several clusters of tech expertise in the area, namely Leeds, Daresbury, Middlesbrough, Liverpool and Salford, with a range of digital assets (The Northern Powerhouse Partnership, 2016).



Figure 3: NPR connecting most of the key locations of potential future development()

Figure 3 illustrates that the NPR would connect most of the key locations of potential future development. Increasing the level of enterprises, driving innovation, raising exports and radically improving productivity are fundamental ingredients for higher growth and rising living standards.

The Northern Powerhouse: Addressing the Relationship between Education and Employment

“ It is unlikely that the significant weakness in productivity in the NPH can ever be reversed unless educational achievement can be improved. Unless the next generation of employee in the Northern Powerhouse can be given an education that equips them to enter the world of work and compete with the best, elsewhere in the UK and the world, then the potential of individuals and the North as a whole will never be reached”.

An effective education system provides the foundations for a capable competent work force which is imperative and conducive for economic growth. The NPH endeavours to provide children with “the same opportunities and support to prosper” regardless of their residency, with the hope to redress imbalance in the quality of education, providing a “unique opportunity to reshape prospects for children in the North”. Empowering the

North with an education system of paralleled excellence to the South will remove any natural advantages produced by a superior education system, but instead equalising employment opportunities.

The North South Divide: Education

There are evident flaws in the North's education system, the gap in the quality of academic institutions apparent, with "135,000 more secondary school children being taught in under-performing schools in the North of England than in the South". This provides categorical evidence into the scale of inequality, resigning students within the North to an unjust disadvantage. Moreover, one may note that there are "twice as many secondary schools judged to be inadequate in the North and Midlands compared with the South", making the discrepancy in the quality of education blatantly apparent, and indisputable.

Remedying Discrepancies Within The Education System

In affiliation with the Northern Powerhouse, in March 2016, the Government created the Northern Powerhouse Education Fund (NPEF) in order to combat the educational divide, allocating £70m of funding to the scheme, the agenda being to equip students with the means to rival their Southern counterparts. The project draws attention to the importance of developing "generic digital skills in all our young people" in order to provide the North with a workforce enabled with skills to compete within the quaternary industry on an international scale. Progress must also be made in levels of attainment, with "attainment and progress [being] below the national level", thus "focusing on academic attainment". By obliging students to engage with course material, not only will the quality of their education be superior, but the North will be equipped with a stronger workforce. This is vital not only in terms of increasing international competitiveness, attracting TNC's to the quality of labour, but will also reduce the likelihood of Southern residents being able to rival Northern residents for employment opportunities.

Leadership and Learning

Empowering the North

A necessary part for creating a Northern Powerhouse is the ability for local leaders to have greater control and influence over decisions that affect communities in the North, and it is important that the North should be a place of start-up and innovation. This requires the development of modern, vibrant places with a strong eco-system of high performing schools, affordable high-quality housing, a strong cultural offer and using the best digital technologies to support an enhanced quality of life.

Nurturing the North's Economic Growth

In order for these to be achieved it is important that the North learns local governance from countries and communities that have effectively realised Local Agenda 21 (LA21) which was put forward in the (UN Rio Summit, 1992) so that communities are engaged and citizens are active in contributing to, and benefiting from, inclusive growth (RSA Inclusive Growth Commission, 2016). Furthermore, In the 2015 Autumn Statement, the Government announced that it had agreed with the British Business Bank and Local Enterprise Partnerships in the North West, Yorkshire and the Humber, and the Tees Valley to create a Northern Powerhouse Investment Fund. With over £500m of investment being available to Northern businesses, as well as Science and innovation audits which pushes partnerships with institutions and local enterprises across the North of England. For example, two audits have now been completed in the North - Greater Manchester working with Cheshire East, and Sheffield City Region working with Lancashire. This Science and Innovation process benefitted from Local enterprise partnerships across the North coming together to share strategic thinking and best practice at the Northern Powerhouse level which has opened up opportunities to work with national players like Innovate-UK. On top of this, the North's energy capability is bolstered by its advanced manufacturing capability, which means that many of the elements in the energy sector's supply chain are located in the North. There also significant strengths in offshore wind power, as well as nuclear (with exciting developments in small modular reactors).

Proposing HS3 as a Better Alternative to HS2

Despite many arguments advocating HS2 (e.g.: Overman, 2012, Chen, 2013), some contend the validity of theorised statistics and development models, arguing that HS2 is a London centric project, and that rather than bridging the North-South divide, it actually amplifies it.

Accessibility and Investment

If trying to minimise the gap between the North and South is the government's main priority, then imposing HS3 would most likely act as a better alternative to HS2, whereby HS3 is more economically significant when it comes to rectifying the already existent divide between North and South (White, 2015). Taking Liverpool, Newcastle, and Sheffield as an example, it is a fact that compared to London and Birmingham, they have a minimal amount of incentives for inward investment. Therefore it is argued that connecting Liverpool, Manchester, Leeds, Hull, and Newcastle, and reducing journey times will lead to easier accessibility to their markets (White, 2015). That being said, easier accessibility will act as an incentive for businesses and investment to take part in the North, leading to an increased and improved market performance, whereby existing markets will supposedly grow and new markets will emerge. Consequently, more employment opportunities are generated, and thus; leading to deteriorating unemployment rates, in addition to an encouraged employment migration, whereby people in the working force will start approaching the North for job opportunities (Rosewell and Venables, 2014)

Addressing Unemployment

While Studies predict that as a result of HS3, the population of "Leeds will grow by 6.3 percent and Newcastle by 5.4 over the next 15 years"(White, 2015) studies also forecast a significant decline in unemployment rates in the North. Figure 1 below shows some significant data on the number of people in the workforce who are willing and able to be employed, but lack job opportunities in 2014, and predicts a decline in this number by 2030 had HS3 been implemented. Taking Leeds as an example, unemployment rates in 2014 were approximately 17,100, and are expected to reach a low of 13,200 in 2030 as

a result of connections with better public transport and more efficient accessibility. Therefore, easier and better commuting capacity will lead a more efficient, effective labor market, which will in turn, increase economic activity and possibly enhance economic growth and development.

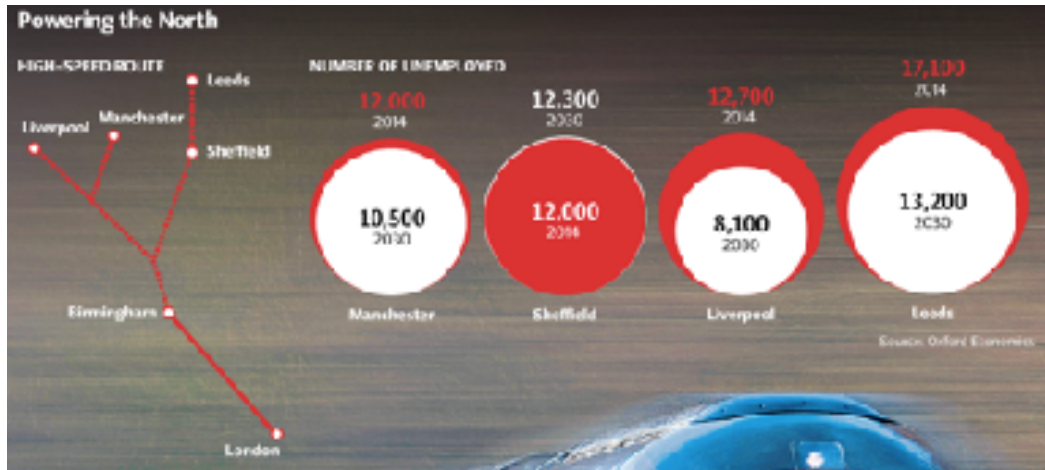


Figure (4): Data on number of unemployed in major cities of the North (white, 2015).

HS2: Vital in Addressing 'Brain Drain' and Retaining a Skilled Workforce

HS3 will then aim at increasing the economic contribution of the North to the whole of the UK economy. This will act as a possible, viable solution to the issue of "brain drain" (Rosewell and Venables, 2014) whereby graduates originally suffer from the issue of a structural performance gap leading to over-qualification in some cases and low paid jobs generally in the North, however with the application of HS3 and with the potential of greater economic growth, graduates will now be motivated to use their skill and potential in the city where they were educated, rather than reaching the South for better, highly paid job opportunities.

HS2 and Invigorating Northern Economic Growth

It is also worth mentioning that potential for trade is likely to increase with increased connectivity, whereby businesses and firms will be incentivized to move to different locations and perform useful economic activity. Improved market access and improving the ease of supplier access is said to increase trade volumes around cities (Rosewell and Venables, 2014), which will in turn lead to a more diversified consumer choice and an increased competition with firms in the market. Theoretically speaking, increased consumer choice will lead to increased aggregate

demand, which will in turn result in higher GDP and economic growth in the area. Moreover, cities in the North alongside cities in the South will be able to make better use of an already existing comparative advantage and different gains of trade, whereby there are inherent characteristics in the North that are of greater quantities and enjoy easier accessibility and vice versa.

Investment in Transport

Vital for the North's Emergence from its Post-Industrial Decline

It is of great importance to acknowledge the urban decline that the North suffered from as a consequence of post-industrialisation, whereby reductions in manufacturing and the modernisation of port logistics have accumulatively resulted in high levels of unemployment. However, the North of UK has always been a major energy provider to the rest of the UK, and at some point in time, the use of clean energy will have to develop and grow as a result of increased carbon emissions, and in this case, the North will be highly efficient in developing such clean energy (powerhouse). Therefore, increased ease in transport resulting in improved capital investment, will offer the North an opportunity to invest in existing capacities and opportunities for growth.

Conclusion

Transport is only one of the essential building blocks for the Northern Powerhouse. As has been shown, the problems related to transport, inequality, and economic activity are all multi-dimensional and interrelated, and thus all require a sound understanding in order to form a high-speed rail proposal that can address the North-South divide. The overriding social and economic shortcoming of HS2 is the North's vulnerability to gentrification and its increased dependence on London. Although the job opportunities from the construction and maintenance of HS2 is undeniable, and the faster commute times will improve business activity between London and Birmingham, it only creates greater appeal for commuting to London. Factory, manufacturing, and research based jobs which are the backbone of the Northern economy rely far less on faster commute times, and are far more concerned with greater connectivity and availability as a whole. It is clear that the proposal for HS3 is more effective at addressing the North's desires and problems by completely eradicating the opportunity for London-centric gentrification.

Fortunately, the necessary policies required to build components for the Northern Powerhouse, and to rectify the social and economic obstructions caused by mobility disadvantages are complementary. HS3 and the Northern Powerhouse allow all sectors of the economy to be widely available. The problem with mobility disadvantages, as well as the North in its current state is that expertise are not given a chance to grow. In the case study of East-Lindsey, England (the low skills equilibrium), economic development has stagnated due to poor infrastructure. Employers find it difficult to find highly skilled employees with high commuting tolerance, thus they demand less and have lower output. Appropriately, people in the area do not seek to enhance their skills, leaving the local economy at a low point. With HS3's connectivity possibilities, and the road and rail infrastructure built to accommodate it, the North can leave its economic rut and become a Powerhouse.

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