

Infrastructure@Manchester

Building the Northern Powerhouse: How do we boost transformative infrastructure investment in Northern England?

Graham Winch and Rehema Msulwa

Report 1 of 4

The publication of Transport for the North's Strategic Transport Plan in February 2019 was a momentous step for the Northern Powerhouse. The Plan builds on the work of the Northern Powerhouse Independent Economic Review published in 2016 and shows how the North can move from a "predict and provide" to a "vision and validate" approach to infrastructure development.



The economy of the North of England continues to fall behind that of the South East, and a core part of reversing that relative decline is transformative investment in transportation, energy, and digital infrastructure. Together these will enable the Northern region to yield the kind of dynamic economic benefits from which the South East has long benefited. Improved infrastructure means employers will be able to draw from a wider pool of skilled workers; stimulate innovation through more intense interaction; and facilitate access to higher paying jobs for those in the more impoverished parts of the region.

Together with investments in skills and education, the North's new infrastructure plans will transform economic growth, particularly in the high tech, professional services, and cultural sectors.

This higher rate of growth is only sustainable if it is accompanied by decarbonisation of transportation through smart digital ticketing, electrification of motive power, and promotion of active travel. This will also make our cities healthier and more pleasant places to live.

We are delighted to be working in partnership with Barclays on this series of thought pieces from *Infrastructure@Manchester* here at Alliance Manchester Business School, which aims to support the development of transformative infrastructure for the Northern Powerhouse.

The first two papers in the series lay out the challenges for the Northern Powerhouse in financing and funding infrastructure investment, while the last two in the series turn to the challenges in delivering infrastructure assets once they have been financed to the budgets and schedules expected.

Professor Fiona Devine CBE
Head, Alliance Manchester Business School

When Barclays became the first bank recognised as a UK Government official partner in delivering the Northern Powerhouse programme, I was determined to keep the momentum going in the drive for equality of prosperity across the whole UK. We went on to help found the independent, business-led Northern Powerhouse Partnership, coordinating campaigns and economic advocacy across all sectors based here in the north.



This commitment is a personal one. As a proud Yorkshireman, I joined Barclays as an apprentice in Barnsley over 35 years ago, and as my career has progressed, I've remained firmly rooted in this part of the world, doing my best to help clients, customers and colleagues along the way. I've never been more excited at the role we can and should play in unleashing the next generation of technology, skills and innovation to deliver wealth and prosperity for society and business across the north of England.

Barclays' heritage across the north stretches back as far as the late eighteenth century. We were involved in some of the most crucial infrastructure investments of the time, such as the financing of the Manchester Ship Canal in the 1890s and the Stockton to Darlington Railway earlier that century. Today, we are proud to have a significant presence in the region - with 12,000 colleagues employed across the regions, innovative and world-leading contact and technology centres at Sunderland, Wavertree and Radbroke, and 2019 sees the first anniversary of our popular £500m Northern Powerhouse Growth Fund to help SME's grow and scale across the north.

Our commitment goes beyond this, however. We are determined to convene the north of England's most experienced and influential businesses, policymakers and academics, working with them to generate new and innovative solutions for improving prosperity for this dynamic and potential-rich part of the UK.

I am delighted to introduce this new research series, *Infrastructure@Manchester*, from Alliance Manchester Business School. The series is one of our flagship thought partnerships in support of the Northern Powerhouse programme, and one I've been greatly looking forward to. Whilst the views and opinions expressed are those of the University's academics and not Barclays, we are nonetheless pleased to be part of shaping the policy debate about the north of England's exciting future.

Tony Walsh
Head of North and Mid Corporate, UK Barclays

Executive summary

Welcome to the first in a series of papers in a new research programme, **Infrastructure@Manchester**, produced by Alliance Manchester Business School and Barclays.

The purpose of this research is to support the development of economic infrastructure for the Northern Powerhouse by providing original analysis and ideas, thereby challenging preconceptions about infrastructure development policy.

There is a huge opportunity for policymakers at all levels across the UK to fully unlock the benefits of infrastructure investment in order to achieve the aims of the Industrial Strategy. This will require a number of significant changes to current best practice in infrastructure investment. Our methods for selecting projects will need to change so that they reflect the full range of benefits from the investment, thereby stimulating growth rather than following growth. Our methods of project delivery will also need to change so that promises made in the investment case are met rather than overrun. We believe that such a modernisation will be crucial in realising the ambition of rebalancing the UK economy and ensuring all areas of the UK benefit equally from infrastructure investment. This way, every pound spent will contribute to greater levels of national productivity, stronger levels of employment, and greater prosperity for people's lives across the UK.

In this first paper, we will argue that transformative infrastructure investment in Northern England is presently faced with two main challenges. First, it suffers because of the historic under-investment by the UK as a whole in infrastructure, and second it suffers because the investment in transformative infrastructure that has been made favours the South East. If the UK is to achieve the ambitions of the Industrial Strategy for the whole country, both of these challenges need to be addressed. More specifically, we will:

- Explain why infrastructure investment is important for economic development in the Northern Powerhouse through an evaluation of the current context.
- Distinguish between enabling and transformative infrastructure assets and the infrastructure services they provide.
- Review the financing of infrastructure, identifying the principal challenges in financing and funding such investment.

Following this we will:

- Make two overarching recommendations regarding future policy for infrastructure development in the Northern Powerhouse on sectoral coordination and focus of national lobbying efforts.
- Introduce the subsequent papers in this series.

Acknowledgements

We are extremely grateful for the feedback of Professor Diane Coyle, Cambridge University, Professor Ian Reeves, Synaps LLP, Simon Warburton, Transport for Greater Manchester; and Ian Palmer, Transport for Greater Manchester on earlier drafts. We, of course, remain entirely responsible for the final version.

Understanding the role of infrastructure and its value

Infrastructure is the cornerstone of modern economies and productive societies. Increasingly complex and interconnected infrastructure services – unimaginable even a decade ago – are required to address the challenges of today's world. These challenges range from social stability, rapid urbanisation and technological advances to globalised issues such as climate change².

This research will focus on economic infrastructure such as transportation, energy, and digital technology with the potential to transform the economic performance of the Northern Powerhouse. We will not cover direct consumption goods such as housing, or social infrastructure such as hospitals. These are no less important, but play a different role in economic development.

The variety of infrastructure services (see technical below) offered by infrastructure assets is indicated in Technical Note: Infrastructure Services Classification, on page 21. which details a series of definitions of infrastructure services, developed from earlier Alliance Manchester Business School research³.

Technical Note: Infrastructure Services

According to the World Bank, the primary measure of economic benefits from infrastructure derives from the operation and the value of the services generated by the physical asset, rather than the asset itself. To that end, infrastructure services contribute to economic development both by increasing productivity and by providing amenities which enhance the quality of life.

Regarding productivity, infrastructure services stimulate aggregate supply and demand through at least two channels. First, transport, water, and electricity, for example, serve as intermediate inputs to production. Any reduction in their costs raises the profitability of production, thus permitting higher levels of output, income, and/or employment. Second, the availability of infrastructure services raises productivity for other capital and labour, such as through a reduction in workers' commuting time.

Regarding quality of life, infrastructural services are linked to both personal welfare and the environment. These impacts are realised in three broad respects: first, reductions in the cost and improvements in infrastructure services to households can have beneficial effects on increasing their real income and consumption; second, infrastructure affects labour productivity and access to employment, and thus the

capacity to earn future income; and third, it affects real wealth. Infrastructure services are, therefore, valued as essential for health and the creation of environmental amenities (e.g. water and sanitation); or as items of consumption in their own right (e.g. recreational transport, residential telecommunications). Moreover, infrastructure services provide access to jobs, education, and opportunities for the consumption of other goods.

Reducing the cost of infrastructure services and improving service provision can, therefore, have far-reaching implications. Realising the benefit of the efficient generation of infrastructure services can allow enterprises to lower their costs with favourable impacts on profits and the level of production achieved. In addition, increased accessibility to reliable and quality infrastructure services for households can positively impact their quality of life by increasing their real income and consumption, raising the productivity of their labour, and freeing time of individuals for higher-value activities in a manner analogous to the benefits realised by firms.

Source: Kessides, C. 1993. The Contributions of Infrastructure to Economic Development: A Review of Experience and Policy Implications. Washington DC, World Bank.

²World Bank Group (2015) Infrastructure Strategy Update FY 2012-2015: Transformation through Infrastructure. World Bank Group.

³Developed from Luger, M. Butler, J. and Winch, G.M. (2013) Infrastructure and manufacturing: their evolving relationship: Future of Manufacturing Project: Evidence Paper 20, London, Government Office for Science. Figure 4.

Enabling or Transformative infrastructure?

Many infrastructure assets provide a range of services simultaneously, and occasionally these services compete for the finite capacity of the same asset. For instance, a railway can provide **commuting**, **transporting**, and **travelling** services. On the US rail network, **transportation** has been prioritised, to the detriment of **travelling** and **commuting**⁴. Elsewhere, other infrastructure assets provide services that reinforce, rather than compete with, each other. For instance, an airport's **networking** services complement its **travelling** services. Complex combinations of these assets, with their competing and reinforcing services, underpin all thriving cities and economies.

In this context, it is useful to distinguish between enabling infrastructure and transformative infrastructure. Each has a different effect on economic growth and transformative infrastructure investment benefits regional economies powerfully and in multiple ways⁵. As we will show in Paper 2, while we have good tools for deciding which enabling infrastructure to build, our tools for transformative infrastructure are weaker.

Enabling infrastructure

Enabling infrastructure supports growth on an existing trajectory. So long as the infrastructure meets certain basic requirements (e.g. volume of vehicle movements or bandwidth) then customers tend not to notice it, except at "pinch points" where weaknesses in infrastructure service provision get in the way of what customers want to do.

Transformative infrastructure

Transformative infrastructure, on the other hand, increases the potential productivity growth rate above the current trajectory. It does this by providing opportunities for innovation both upstream in the development of the infrastructure asset, and downstream in the supply of new infrastructure goods and services. For instance, the development of the telegraph was central to the development of the electrical engineering industry and provided whole new methods of rapid communication.

These two types of infrastructure do not exist in isolation. Many innovative methods of providing infrastructure services come from combining different assets in new ways. An example is the combination of travelling services and positioning services such as GPS, which together allow real-time timetable updates at bus stops. Combinations such as this lay the ground for innovators like Uber, allowing them to unlock the potential for whole new technologies e.g. autonomous vehicles. In other words, innovative combinations of enabling infrastructures can themselves be transformational. However, lack of an overall strategy can worsen existing problems. For instance, 50% of the increase in traffic congestion in San Francisco between 2009 and 2016 is attributed to "transportation network companies" such as Uber and Lyft⁶.

Technical Note: Infrastructure Services Classification

Commuting – the movement of people to their regular workplaces. Superior infrastructure allows people to commute quicker and less stressfully and thereby allows organisations to draw on more regionally distributed skills. The prototypical infrastructure asset here is the urban transit system.

Positioning – the location of particular vehicles in space and time. The advent of global positioning systems (GPS) has allowed precise locations to be determined quickly and movement to be tracked. The prototypical asset here is the lighthouse, but satellite systems are now vital infrastructure assets.

Transporting – the movement of goods either as part of the supply chain into manufacturing or onwards through the distribution chain to market. Prototypical assets here include pipelines and ports.

Travelling – the movement of people to meet with each other and visit locations for business and leisure purposes, distinguished from commuting. Roads and rail are prototypical.

Communicating – enabling interpersonal communications beyond co-presence. Telecommunications assets of various kinds are prototypical.

Networking – the creation of nodes of activity which rely for their success on their position in the network of activity, also called "connectivity". Airport assets are particularly important here.

Transmitting – the movement of data and energy through both fibre optic and energy distribution networks such as national grids.

Disposing – the handling of waste from business and leisure activities and the disposal of redundant assets. Sewage systems are prototypical here.

Generating – the creation of usable energy whether from fossil or sustainable resources.

⁴ Kanter, R.M. (2015) Move: Putting America's Infrastructure Back in the Lead. New York, Norton.

⁵ World Bank (2011) Transformation through Infrastructure, Washington DC, World Bank.

⁶ Bradshaw, T. (2018) Robo-taxis or high-tech tunnels? The race for traffic utopia. Financial Times November 23rd

The international infrastructure context

Despite this transformative effect infrastructure can have, globally the UK lags behind its peers on investment in infrastructure development, as shown in table 1.1. This gap is partly down to under-investment: the UK spent 2.2% of GDP on infrastructure in the period 2008-13, a similar percentage to the US and Germany but significantly less than France at 3.5%, Japan at 4%, Italy at 4.7% and Australia at 4.7%.

Moreover, the perceived quality of UK infrastructure was ranked 24th globally in the latest World Economic Forum report⁷, with inadequate infrastructure identified as the most serious barrier to business by 12.6% of respondents – much higher than for any comparable country. It is important this is

addressed because it lets down the UK as an otherwise hospitable environment for business.

The McKinsey Global Institute⁸ estimates that the UK has under-invested in infrastructure for years, with infrastructure investment as a share of UK GDP only rising above pre-financial crisis levels in 2017. Within the UK, the North has shared this underinvestment. Given the transformative effect that infrastructure can have, it is essential this is addressed. A start has been made in the Industrial Strategy and the formation of the National Infrastructure Commission, but much more needs to be done to allow the UK to catch up with comparable nations.

	Perceived Infrastructure Quality (1-7 scale) (Source: WEF EOS)	Supply of infrastructure most problematic for doing business (% of respondents) (Source: WEF EOS)	Spend on infrastructure development 2008-13 (% of GDP) (Source: National Statistics)
United Kingdom	5.2	12.6	2.2
United States	5.7	5.2	2.4
Canada	5.2	7.9	3.5
France	6.0	0.6	3.5
Germany	5.7	3.8	2.0
Italy	4.3	6.1	4.7
Australia	4.8	6.1	4.7
Japan	6.2	2.1	4.0

Table 1.1. UK Investment in Infrastructure and Perceived Infrastructure Quality⁹

⁷ World Economic Forum (2016) The Global Competitiveness Report 2016-17

⁸ McKinsey Global Institute (2018) Solving the United Kingdom's Productivity Puzzle in a Digital Age. McKinsey.

⁹ Sources: Data taken from World Economic Forum (2016) The Global Competitiveness Report 2016-17. Geneva, WEF and McKinsey Global Institute (2016) Bridging Global Infrastructure Gaps. McKinsey.

The gap in transformative infrastructure potential is serious

According to the 2016 Northern Powerhouse Independent Economic Review (NPIER)¹⁰, the North of England is home to 16 million people and 7.2 million jobs. The region has many high profile and growing businesses and a highly skilled workforce. It houses high value sectors such as advanced manufacturing, with the engineering of low carbon technologies; and health innovation, for instance, with the development of smart medical devices. The region generated around £290bn of Gross Value Added (GVA) in 2015, about one fifth of the UK's total. The North also generates 17.7% of UK manufacturing exports.

However, the NPIER also reports that there are persistent gaps in GVA per capita and productivity performance in the North compared to the rest of the UK. The nominal GVA per hour worked in the region is 11% lower than the national average, and 32% lower than in London. Productivity is 25% lower than the national average. This gap has been persistent over the last 30 years. In 2014, it equated to a £4,800 per person difference in income between the North and the UK average, and a £22,500 per person difference between the North and London. The NPIER attributes this underperformance to gaps in skills, innovation, investment, and R&D intensity, particularly in the North's large urban areas. This gap holds back the local and national economy. Fixing it requires a radical change in policy.

The Northern Powerhouse programme was designed to facilitate this change. It was established by the UK Government to raise the North's productivity, stimulate its growth and attract significant inward investment. The potential gains are huge. The NPIER found that by 2050 the economy of Northern England could be around £100bn bigger than current projections suggest. This would translate into an extra 850,000 jobs, a 4% increase in productivity and more money in the pockets of local people.

But talk to businesses in the North and you immediately realise that people are doubtful. The perception is that the North of England loses out to London and the South East when it comes to investment flows. There is evidence to support this perception. For instance, analysis by IPPR North found that over the period 2012/2013 to 2016/2017, £121 billion was spent on infrastructure across all UK regions¹¹. Of this, London received £33.3 billion, or approximately £3,902 per capita – well over double the Northern England average of £1,513 per capita over the same period.

However, the definition of "spending" used in this analysis is very broad, and includes categories such as London's 100% business rate retention and private sector finance levered by public sector investment. If we focus on direct government spending alone, we can see from table 1.2 that the Department for Transport's road and rail budget allocates more money to the North than would be justified by share of population or GVA alone. We would also note that 100% business rate retention is available under some devolution deals in the North¹², and as the Metrolink case study shows, it is possible to lever private finance in the North where the business case is strong.

We infer from this analysis that the challenges around enabling infrastructure in the North derive from the long-running underinvestment in economic infrastructure generally in the UK, and that the regional equity issues are largely around transformative infrastructure projects. Much of the overall imbalance comes from these south-east orientated mega-projects such as Crossrail, HS2 Phase 1, and Heathrow redevelopment¹³. We therefore argue that the Northern Powerhouse needs to focus its campaigning energies on ensuring that Northern Powerhouse Rail and HS2 Phase 2 are fully delivered in an integrated way rather than dissipating effort across a larger number of enabling infrastructure projects. Getting the nuclear energy programme back on track would also reap significant transformative benefits. Together, these investments will transform the region's economic performance.

Average Spending per annum	Road (Highways England) (2015 prices)	Rail (Network Rail) (2012 prices)
Historical allocation	£479m	£600m
Population-based	£380m	£579m
GVA-based	£305m	£465m

Table 1.2. Road and Rail Financing in the North, Actual and Hypothetical (based on share of population and GVA)

¹⁰ SQW (2016) The Northern Powerhouse Independent Economic Review. Transport for the North

¹¹ Raikes, L. (2018) Future Transport Investment in the North. IPPR North.

¹² Raikes, L. Millward, L. & Longlands, S. (2018) State of the North: Reprioritising the Northern Powerhouse. IPPR North

¹³ Cox, E & Davies, B. (2014) Transformational Infrastructure for the North: Why We Need a Great North Plan. IPPR North

Northern infrastructure is interconnected but uncoordinated

We have, so far, focused on transportation, but individual infrastructure asset types should never be looked at in isolation because they are mutually reinforcing in terms of economic development. Consider transport, energy and digital infrastructure in the North.

Good transport systems enhance connectivity, which enables economic development by supporting the productivity of urban areas – this was fundamental to the business case for Metrolink (see case study). Good transport links support deep and productive labour markets and allow businesses to reap the benefits of agglomeration. We will explore the crucial concept of agglomeration further in Paper 2, but a quick definition is the net benefits available from bringing together firms and skilled workers in close proximity.

Energy plays a vital role in economic growth as it is required to power the economy and society through generating and transmitting services, and the North is uniquely placed to lead the UK’s transformation towards a low carbon economy. The region currently accounts for 48% of UK renewable generation capacity, with particular opportunities in tidal generation, carbon capture and hydrogen energy. It also has a unique concentration of nuclear expertise, with full fuel cycle capabilities, coupled with a world-class skills base. This means that regaining momentum on the UK nuclear programme – particularly at Moorefield in Cumbria – is relatively important for the economy of the North. The potential contribution to the transformation of UK energy infrastructure by the North is, therefore, outstanding. The aspiration of the Northern Energy Strategy is that “by 2050 we will be the leading low carbon energy region in the UK, with an energy economy worth £15 billion per annum and 100,000 green jobs”.

Digitisation – the mass adoption of connected digital communicating and transmitting services by consumers, enterprises, and governments – has emerged in recent years as an important economic driver that accelerates growth and facilitates job creation. A study by Tech North showed that digitisation performs best when there is a tight-knit community of relevant businesses – i.e. agglomeration.

Individual Northern cities are strong in terms of digital connectivity and Ofcom reports that in most of the North’s major city regions, more than 90% of businesses can access superfast broadband, exceeding national access levels. However, Northern England also includes vast rural areas, including the two least densely populated counties in England. Here digital infrastructure service levels are poor: in Cumbria and North Yorkshire only 83% of premises have superfast broadband access, and in Northumberland the figure is 86%.

Most importantly for our argument though, is that these infrastructure assets and the services they provide are mutually reinforcing. You can see just a few areas of mutual reinforcement on the opposite page.

Part of the problem is that responsibility for infrastructure developments is spread across five government departments, overseen by HM Treasury: The Department for Business Energy and Industrial Strategy, the Department for Digital, Culture Media and Sport, the Department for Transport, the Department for Environment, Food and Rural Affairs and the Ministry of Housing, Communities and Local Government.

We therefore argue that the Northern Powerhouse would benefit from a coordinating body for infrastructure development and resilience. The formation of the NP11 grouping of the Chairs of the eleven Local Enterprise Partnerships in the Northern Powerhouse area is a start in this direction, but more is needed.

¹⁴ Glaeser, E.L. (2010) Introduction. In: E.L. Glaeser (ed) Agglomeration Economics. Chicago, University of Chicago Press.

¹⁵ IPPR North (2017) A Northern Energy Strategy. IPPR North.

¹⁶ Tech North (2016) The Digital Powerhouse. Tech North.

¹⁷ Ofcom (2016) Connected Nations 2016: Interactive Summary

¹⁸ Ibid

Mutually Reinforcing Infrastructure Assets and Services

1

The electrification of road transportation is impossible without major investment in electricity transmission services in the form of charging points.

2

The development of the digital economy depends on increased agglomeration to provide the intensive interaction required for rapid innovation. This agglomeration in turn relies upon improved commuting and travelling services from public transportation and very high speed transmission services from fixed and mobile networks.

3

With more intense agglomeration, failure to develop public transportation will lead to gridlock as people switch to innovative road transportation using positioning services.

4

The full development of Cumbria’s Energy Coast (wind and nuclear) will depend on improved road and rail transportation.

5

Infrastructure resilience is also mutually dependent. One weakness can undermine an entire infrastructure ecosystem. For example, during the Cumbrian floods of 2015, rising water hit a power substation, knocking out a water pumping station and the local mobile phone network. Card machines in local shops went down, meaning local people were unable to buy essential supplies

Case study:

Manchester Metrolink: a northern infrastructure success

Manchester Metrolink is the oldest and largest urban tramway in the UK, mixing off and on-street running. It was able to cover its operating costs for 2016/17, although the shift to a new operational contract with higher operational benefits led to a net loss in 2017/2018. Opened in 1992, it has expanded through a number of phases of redevelopment to a six-line network of 99 stops, with plans for further expansion. While the details have changed over the years, the principles of its success have remained much the same. In essence, these are mixed finance in order to construct the network; funding from the farebox; and private sector operation of the network. Government revenue grants also helped with funding costs in the earlier phases. These are all in the context of strong institutional governance in the Greater Manchester area and a focus on increases in Gross Value Added in investment appraisal.

Phase 1 (Bury to Altrincham) was financed by a mixture of borrowings by the (then) Greater Manchester Passenger Transport Executive (GMPT), borrowing from the European Investment Bank, and grants from both UK central government and The European Regional Development Fund. A Design, Build, Operate and Maintain (DBOM) contract was then let to a private sector joint venture which transferred operational risk to the contractor which also paid a £5m concession fee towards construction costs. This arrangement meant that Metrolink had the lowest proportional central government contribution of all light rail investments of the period except the Docklands Light Railway in London. Phase 2 (to Eccles) saw a major contribution from the new operational contractor, the use of reserves by GMTPE and a small amount of additional borrowing.

Phase 3 was a major expansion of the network to Ashton-under-Lyne, East Didsbury, Manchester Airport, and Rochdale via Oldham. The Rochdale line was financed from a government grant and borrowings by the GMPT, repayable from the farebox. In order to finance the other lines from the Transport Innovation Fund, a local referendum was held on introducing congestion charging within the M60 in order to generate a funding stream. This was overwhelmingly rejected by residents, and so the business cases for other lines were re-evaluated. This led to the establishment of the Greater Manchester Transport Fund (GMTF). The GMTF forms a single pot of government grants, local borrowings and private sector contributions to finance a variety of transport initiatives. Funding came from a Greater Manchester-wide increase in Council Tax orchestrated through the Association of Greater Manchester Authorities (AGMA), and Manchester Airport, yielding £279.20 million in 2018/19.

The Greater Manchester Combined Authority (GMCA) was formed in 2011 and GMPT renamed Transport for Greater Manchester (TfGM) to own Metrolink and further its development. TfGM re-let the operational contract for Metrolink in 2017. Financing for the next extension of the network to Trafford Park combined government grants with contributions from owners of much of the land accessed by the line, The Peel Group, and Section 106 deals for other developments along the route. In addition to the farebox and council tax, funding comes from the new "earnback" facility under the 2014 Greater Manchester Devolution Deal which gives Greater Manchester extra money for the region's infrastructure if certain levels of economic growth are reached.



Section two

Making the Northern Powerhouse a reality: how to unlock investment

We have established the case for infrastructure investment in the Northern Powerhouse, and shown that the North shares in the long-running under-investment in UK infrastructure generally. But that it is particularly disadvantaged in comparison to London and the South East in the level of transformative infrastructure investment that is needed to support the achievement of the aspirations laid out in the Northern Powerhouse Independent Economic Review. For this reason, we suggest that the Northern

Powerhouse and its Metro Mayors should focus their campaigning efforts on ensuring that Northern Powerhouse Rail and HS2 Phase 2 are fully delivered in an integrated way.

A huge challenge to delivering transformative infrastructure is financing and the first step to unlocking investment is understanding infrastructure financing – the process of raising capital to invest in an infrastructure asset. Figure 1.1 indicates the generic financing arrangements for infrastructure.

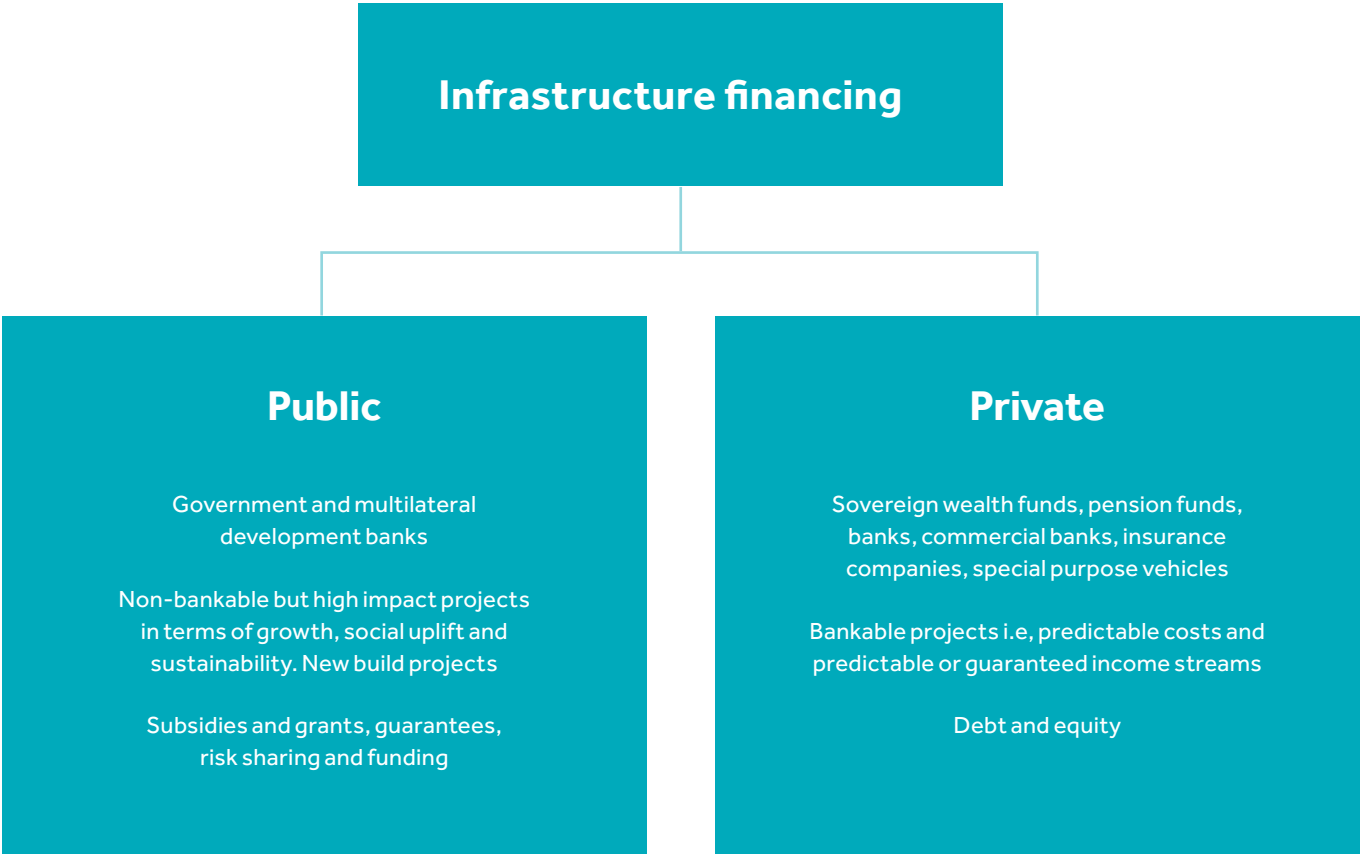


Table 1.1. Generic financing arrangements for infrastructure

The public financing model: can infrastructure investment reduce public sector net debt?

Public capital comes mainly from governments, principally via taxation but also via public borrowing. Public finance for infrastructure projects therefore contributes to public sector net debt (PSND). The cost of this debt financing is significantly lower relative to the private sector, due largely to taxes and other public assets that effectively serve as collateral on the debt. An alternative public-sector financing mechanism is the national or multinational development bank¹⁹. A major advantage of such financing is that the loans are off the PSND, while the effective public-sector guarantee enjoyed by such banks tends to make the loans cheaper.

Internationally, the proportion of GDP devoted to infrastructure investment by the public sector has dropped as governments struggle with public deficits. However, new research by the International Monetary Fund²⁰ suggests that government borrowing to invest in infrastructure development can reduce PSND, under certain conditions, through two separate processes. First, the construction of an asset itself can increase short term economic growth. Second, new infrastructure services can both enable existing economic activity (e.g. by reducing commuting time) and transform new types of activity (e.g. by allowing new forms of digital industry). These are medium to long-term benefits and reduce PSND through increased tax and associated revenues for government.

In general, public investment in infrastructure will be positive for PSND if:

- 1. There are robust project selection procedures in place
- 2. Project delivery capability is well-developed
- 3. There is an infrastructure gap which creates the opportunity for investments with good returns
- 4. Economic activity is sufficiently moderate so that inflationary effects are mitigated

We will discuss the first of these conditions in papers 2 and 3, and the second in papers 4 and 5. For now though, as we will show, the four conditions above apply particularly strongly to the Northern Powerhouse region.

A basic principle of UK practice on investment appraisal is that multiplier effects are constant across investments and that, therefore, multiplier effects should not be used in the calculation of benefits from an investment²¹. However there is evidence from sectoral differences in employment multipliers for relatively high multiplier effects from infrastructure services and a reasonably high multiplier effect from construction activity compared to other sectors of the economy²². There is also evidence of regional differences in prices within the UK, with London and the South East having the highest, and the Northern Powerhouse some of the lowest prices²³, and lower inflation rates outside London²⁴.

Therefore, we suggest that a public investment of £100m in infrastructure would provide a greater net benefit to the UK economy if invested in the North than the South East: it would likely provide a greater economic boost relative to current activity and would likely have lower input costs and rate of inflation in those costs. While we agree with HM Treasury that this might be difficult to calculate at the level of the individual project, we believe that the suggestion warrants further investigation at the level of differences in regional and sectoral benefits and costs and hence the overall benefits to the UK economy of a policy initiative around infrastructure investment outside the London area.

¹⁹ Such as the European Investment Bank (EIB) which is a significant player in financing the Northern Powerhouse. The National Infrastructure Commission has proposed a National Investment Bank which has the potential to replace the EIB following Brexit but would take significant time to set up.

²⁰ International Monetary Fund (2014) World Economic Outlook: Legacies, Clouds, Uncertainties. Washington, IMF.

²¹ HM Treasury (2018) The Green Book: Appraisal and Evaluation in Central Government. London, HM Treasury.

²² Office for National Statistics (2018) <https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetales/adhocs/008722typeiukftmultipliersandeffectsreferenceyear2014>.

²³ Office for National Statistics (2018) Relative regional consumer price levels of goods and services, UK: 2016. ONS.

²⁴ National Institute for Economic and Social Research (2018) <https://www.niesr.ac.uk/media/niesr-press-note-niesr-reacts-latest-ons-cpi-inflation-statistics-released-today-13558>

The private financing model: Challenges to the status quo

Private sector financing focuses on “bankability”, or whether lenders will consider financing the project. Ultimately, private investors prefer it when investment costs can be forecast, and funding streams are predictable, so it is important that Northern Powerhouse stakeholders encourage the development of projects with predictable costs and monetised benefits.

The UK has established mechanisms to support private investment. These include the UK Guarantee Scheme²⁵, which helps infrastructure projects access debt finance where they have been unable to raise it in the markets. Alternatively, depending on the nature of the project and relevant criteria, sponsors can also draw on various forms of government development capital such as repayable grants and low-interest loans.

Government involvement lends legitimacy to schemes where user charges are insufficient to service an infrastructure asset’s capital and operational requirements. For example, subsidies can be given in cases where support is needed for the funding stream – see the Metrolink case study on page 12.

Different types of investors focus on different types of projects. Governments tend to focus on projects with the greatest economic and social impact, but where secure direct funding streams cannot be identified. They also focus on new-build projects, particularly as these often support new jobs, services and growth. In contrast, some private investors may tend to avoid such projects given that they carry both construction and operational risks and prefer to invest in operating assets.

The mix of private investors can fluctuate. After the financial crisis, for example, new regulatory requirements made banks step back from longer term loans and risk-heavy projects. In contrast, institutional investors such as insurers and pension funds stepped forward – but these investors, by their nature, prefer operating assets with known returns and no construction risk.

Many attempts have been made to mix the strengths of public and private investment. Public Private Partnerships (PPP), for example, can be very successful, particularly in situations where funding comes directly through user tolls rather than taxpayers. The Mersey Gateway Bridge provides an example of such a concession. But such opportunities are limited for Northern Powerhouse infrastructure. In the early 1990s the UK launched the Private Finance Initiative (PFI). This was

innovative because it relied on private capital to finance the project, but ongoing funding then came from the sponsoring government organisation rather than direct user charges. However, changes to both government accounting policies and financial markets have stifled PFI, and by 2012 the real value of projects approved was below 1996 levels²⁶. In addition, while improving access to financing, PFI did little to address subsequent shortfalls in income, leaving some asset owners, including hospital trusts, unable to fund capital repayments. PFI has now been abandoned, but concession-type PPPs such as the Mersey Gateway Bridge remain²⁷ an option.

The PFI volte-face highlights an important point about the provision of infrastructure – namely the difference between finance and funding. The former gets a project off the ground, while the latter is the subsequent income stream which provides the ability to repay the initial capital. PFI, in effect, addressed the financing challenge, but did not address the funding challenge; indeed, it made the funding challenge more difficult by raising the cost of capital. As illustrated in figure 1.2. these funding streams take a variety of forms, from road tolls and water rates, through availability charges, to repayment from general taxation. In every case, households ultimately fund new infrastructure²⁸.

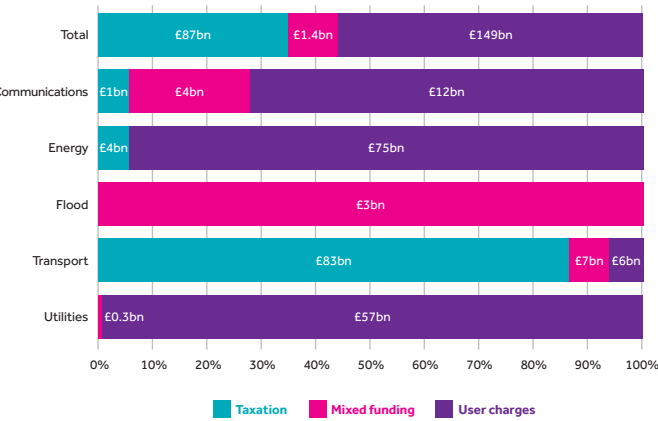


Figure 1.2. Funding of the Infrastructure Pipeline 2016-21²⁹

Arguably, the principal challenge for the Northern Powerhouse is funding rather than financing³⁰. Issues around PSND notwithstanding, both public and private finance is readily available for good quality infrastructure investments. The challenge is how to repay that investment without burdening households too heavily.

²⁸ National Infrastructure Commission (2018) National Infrastructure Assessment, NIC.

²⁹ Institute for Government analysis of Infrastructure and Projects Authority data.

³⁰ KPMG (2018) Transport for the North Long Term Investment Programme. Transport for the North.

²⁵ This was used for the Mersey Gateway bridge, for instance.
²⁶ Winch, G. M. & Schmidt, S. E. (2016) Public Private Partnerships: A Review of the UK Private Finance Initiative. In: Jefferies M.C. & Rowlinson, S. (Eds) New Forms of Procurement: Public Private Partnerships and Relational Contracting in the 21st Century. London, Taylor and Francis. 35-50.
²⁷ Hammond, P. (2018) Budget Speech, 29 October.

The challenges of infrastructure investment

As we have seen, the success of the Northern Powerhouse relies on creating an environment that supports investment in infrastructure. Do that, and you unlock jobs, growth and prosperity. But how do you create that environment in the first place? According to the McKinsey Global Institute³¹, consensus is building regarding the determinants of a successful infrastructure policy. These fall into two different groupings.

The first, finance, relates to the institutional environment which facilitates the flow of public and private finance into infrastructure investment. Important factors for private finance include:

- Developing a pipeline of bankable infrastructure projects
- Agreeing an appropriate regulatory framework
- Developing standardised approaches to infrastructure as an asset class

Regional actors cannot really affect factors two and three, although it should be noted that the UK already has a world class regulatory and institutional framework for infrastructure³². The first point highlights the importance of the establishment of Transport for the North as a sub-national transport authority in April 2018 and the National Infrastructure Commission nationally.

Important factors for public investment include:

- Deciding who should benefit from tolls and land value uplifts – the public or private sector
- Potential changes in public accounting which would allow infrastructure investments to be amortised rather than being booked as a cost at the time of investment
- Relaxing requirements for Public Sector Net Debt, allowing the public sector to borrow for investment in productive assets

The second grouping, affordability, relates to the opportunity to reduce the cost of investment. A study by the McKinsey Global Institute³³ concluded that international infrastructure projects could save up to 38% from their current costs: 8% from “fact-based project selection”, 15% from “streamlined delivery”, and 15% from “making the most of existing infrastructure”. The first of these savings, fact-based project selection, will be the focus of our second paper, while our fourth and fifth papers will investigate aspects of streamlined delivery.



³¹ McKinsey op cit
³² Global Infrastructure Hub (2018) Infracompass UK Overview, GIH
³³ Ibid

Conclusions and initial recommendations

In this first paper, we have argued that investment in the crucial transformative infrastructure that the Northern Powerhouse needs to achieve its ambition faces two main challenges. First, it suffers because of the historic under-investment by the UK as a whole in infrastructure, and second, it suffers because the investment in transformative infrastructure that has been made favours the South East. If the UK is to achieve the ambitions of the Industrial Strategy for the whole country, both of these challenges need to be addressed. The subsequent papers in this series will explore how this can be done in more detail.

Thanks to developments over the past decade, the UK has world-class institutional arrangements in place to ensure that money is well spent, and these are now being replicated at the Northern Powerhouse level. However, the UK also needs to improve its capability for project delivery so that the investment case is delivered – the topic of the fourth and fifth papers. There are still challenges in infrastructure project delivery – even on projects that are widely recognised to be using best practice. Crossrail is a recent case in point.³⁴

It is the view of the authors that the case for transformative investment in Northern Powerhouse infrastructure is clear – particularly in the area of transportation, but also digital and energy. An increased level of investment in all three areas will have consequent positive impacts on productivity, regional economic growth and national economic rebalancing. Compared to the South East, the region lacks transformative infrastructure; increased local investment in such infrastructure will improve productivity, regional economic growth and the national economic balance. Financing is available for investment in the areas of transportation, digital and energy. The means to justify increased investment lies – as we will cover in the next papers – in an adjustment of the appraisal methods that inform investment decisions.

³⁴ Crossrail delay overshadows project's overall success, Financial Times, 17th September 2018.



Section three

Recommendations and next steps

At this stage of our programme, we make three overarching recommendations:

1

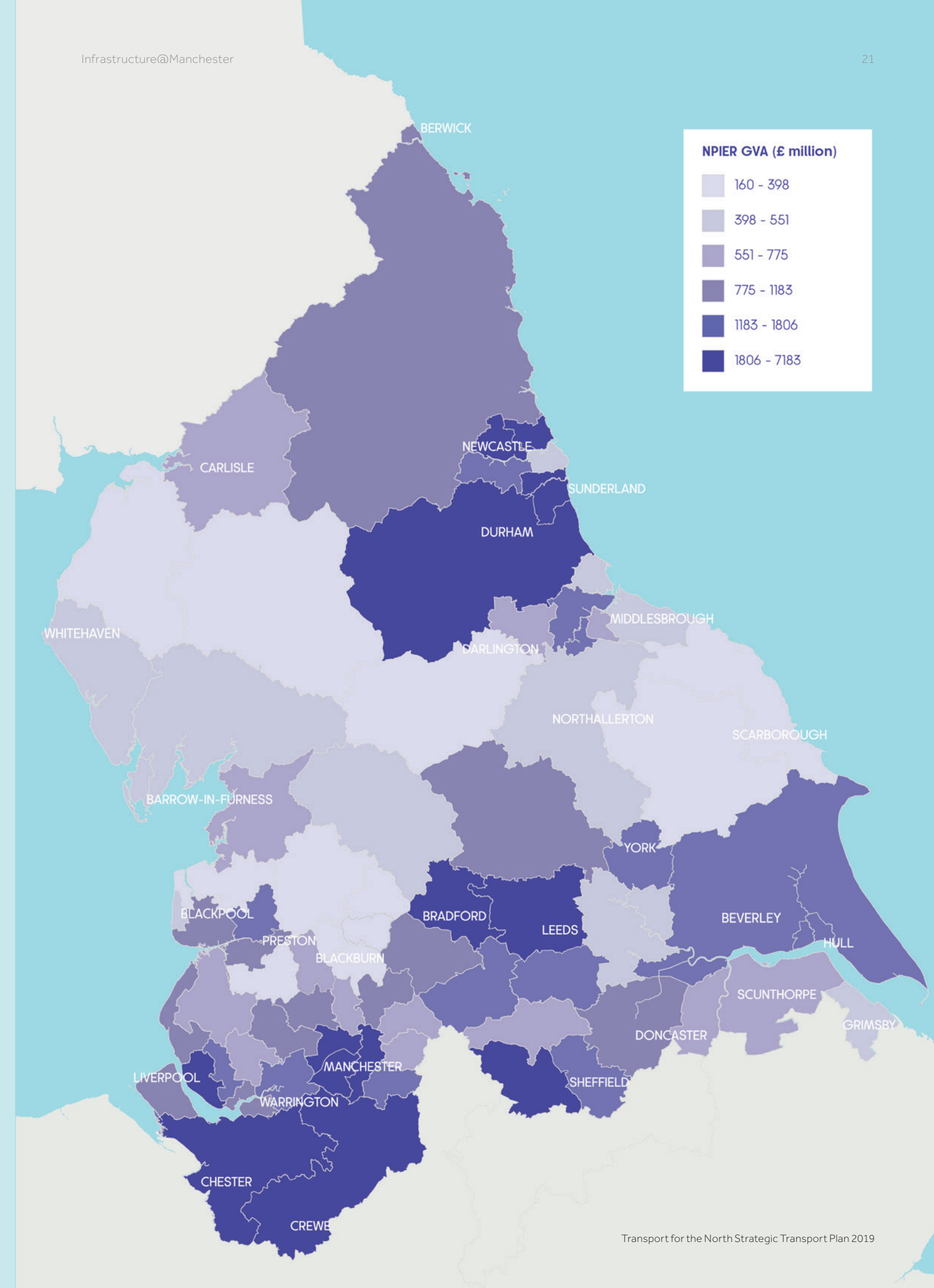
A new pan-Northern coordinating body should be set up for infrastructure development and resilience. This body should advise national and local government, as well as business and third-party stakeholders, on the opportunities, networks and barriers between infrastructure sectors, and deliver an integrated pipeline of infrastructure investments.

2

Campaigning around infrastructure investment by the Northern Powerhouse and its Metro Mayors should be focused on transformative infrastructure assets such as Northern Powerhouse Rail and HS2 phase 2, rather than a generalised “ask” of central government which risks competing for a larger share of a shrinking budget. Within this campaigning the opportunities for private sector investment such as at the Manchester Airport Interchange should be maximised.

3

It would be appropriate to commission further research into the implications of regional differences in inflation rates and sectoral differences in multiplier effects for investment appraisal – this might be an appropriate task for the National Infrastructure Commission or Transport for the North.



Appendix - Glossary

Agglomeration Economies: The benefits that come when firms and people locate near one another together in cities and industrial clusters.

Bankability: The willingness of private investors to finance a project or proposal at a reasonable interest rate.

Concession: A type of PPP where an SPV contracts to finance, build and operate public projects in return for a regulated funding stream direct from users (such as a toll) before returning the asset to public ownership.

Economic infrastructure: Long-lived and costly capital assets often with complex design architectures that are required for economic growth and development in the public and private sectors. Economic infrastructure is distinguished from social infrastructure such as schools and hospitals which support broader societal goals.

Enabling Infrastructure: Long-lived assets engineered and constructed to support growth on the existing trajectory.

Financing: The process of raising the capital to invest in the infrastructure asset.

Funding: The income stream generated by the infrastructure services provided by the infrastructure asset which provides the ability to repay the financing capital. This may be directly from consumers of the infrastructure services (tolls; utility charges); from taxation; or mixed (see figure 1.2).

Gross Domestic Product (GDP): A measure of economic activity in a country calculated by summing the final aggregate value of all the finished goods and services produced within a country's borders in a specific time period less the value of the imports required for those goods and services.

Gross Value Added (GVA): A measure of the contribution to GDP made by an individual producer, industry or sector calculated by adding the total value of goods and services minus the cost of inputs that have gone into the production of those goods and services. GVA is shared between government (through taxation), employee incomes, and profits.

Growth: An increase in the market value of the goods and services produced by an economy, compared from one time period of to another.

Infrastructure Services: The benefits supplied by infrastructure assets as shown in Technical Note: Infrastructure Services Classification on page 7.

Multiplier Effect: Shorthand for the way in which a change or new injection in spending produces an even larger change in final income. It is usually measured through the direct and indirect employment generated by the investment.

Private Finance Initiative (PFI): A type of public private partnership where an SPV contracts to finance, build and operate an infrastructure asset for an agreed funding stream from the taxpayer. Typically used for social rather than economic infrastructure, but has been used to keep privately financed roads toll-free.

Productivity: A key source of economic growth and competitiveness typically calculated for the economy as a whole, as a ratio of gross domestic product (GDP) to hours worked.

Public Private Partnership (PPP): A long-term contract between a private party and a government entity for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance such as in PFI or a concession.

Special Purpose Vehicle (SPV): A subsidiary company with an asset/liability structure and legal status that makes its obligations secure, even if the parent company goes bankrupt.

Transformative Infrastructure: Long-lived infrastructure assets engineered and constructed to increase the potential productivity growth rate above the current trajectory.

The authors



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