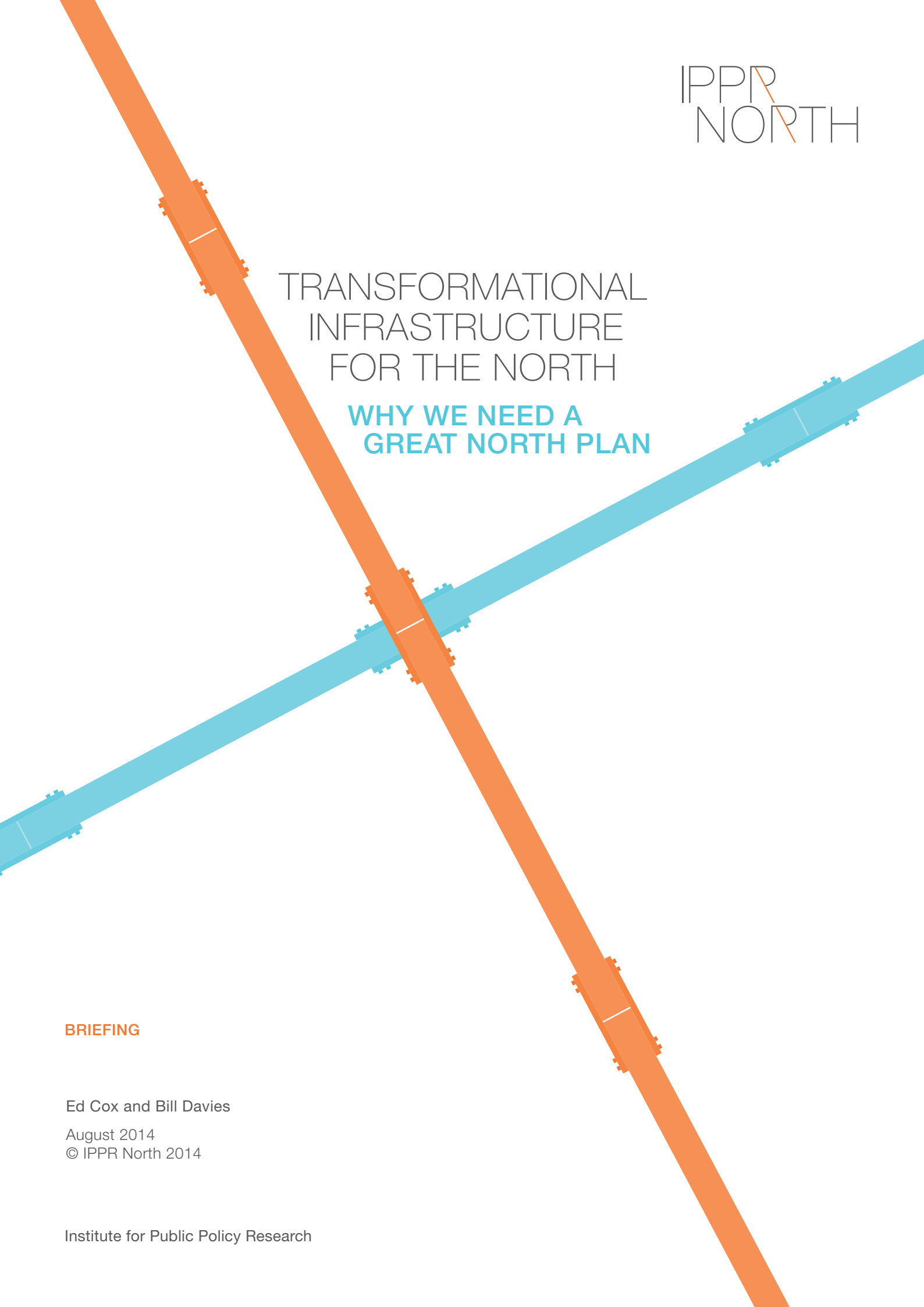
IPPR NORTH

TRANSFORMATIONAL INFRASTRUCTURE FOR THE NORTH

WHY WE NEED A GREAT NORTH PLAN



BRIEFING

Ed Cox and Bill Davies

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Institute for Public Policy Research

ABOUT IPPR NORTH

IPPR North is IPPR's dedicated thinktank for the North of England. With bases in Newcastle and Manchester, IPPR North's research, together with our stimulating and varied events programme, seeks to produce innovative policy ideas for fair, democratic and sustainable communities across the North of England.

IPPR North specialises in regional economics, localism and community policy. Our approach is collaborative and we benefit from extensive sub-national networks, regional associates, and a strong track record of engaging with policymakers at regional, sub-regional and local levels.

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BOLD IDEAS
for CHANGE

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SUMMARY

Infrastructure is the vascular system of the economy, its veins and arteries, allowing people and goods to move quickly from place to place, allowing trade to flourish and accelerating business activity.

International evidence shows that investing in infrastructure is essential to competing in the global economy and driving economic growth. Yet, for a highly developed country, the UK has underinvested in major infrastructure networks, and according to the World Economic Forum, is slipping down the world rankings in terms of infrastructure provision (WEF 2013).

As a result, the last two governments have begun to take infrastructure seriously again, culminating in the national infrastructure investment pipeline, which outlines current and future capital projects across the United Kingdom. Indeed, building infrastructure often demands government involvement to support investments where the market cannot – for example, by readying unviable sites to mobilise private investment, providing and assembling land for projects, or providing loan guarantees for developers. Equally, and often overlooked, public investment in infrastructure can help to redistribute costs of investment more fairly across society (NAO 2013) by allowing public spending to absorb the costs, rather than consumers through, for instance, higher utilities bills.

Yet, for all the value of public investment in infrastructure, the way the government spends money is out of balance. Despite OECD research showing that money wisely invested in weaker economic regions can deliver higher rates of return through economic growth than investing in areas that need it less (OECD 2012), London, with its dense infrastructure provision, is the overwhelming beneficiary of publicly leveraged investment.

Treasury figures project London's per capita publicly supported infrastructure spending at around £5,426 per resident, while the north of the England receives much less. Investment in the North West region is projected at £1,248 per resident, much of that being channelled into Sellafield , while Yorkshire and the Humber sees £581 per resident and the North East, with few capital projects, only £223 spent per resident (HMT 2014).

In part, this imbalance is a reflection of the fact that current methods of infrastructure appraisal are skewed in favour of direct user benefits rather than their wider economic benefits. As such they often disadvantage areas of the North and need to be reformed to give stronger weight to economic development.

But another reason for such regional disparities lies in the location of large-scale transformational infrastructure projects. The combined cost of three of London's major projects (Crossrail, Thameslink, and London Underground improvements) exceeds £34 billion. These three projects alone outstrip total investment in the whole of the north of England.

For this reason, we argue that the North needs to bring forward a range of projects that could genuinely *transform* the northern economy as it makes the journey from an industrial past to a more connected future. Such projects, alongside smaller investments, stand the greatest chance of rapidly enhancing northern productivity and economic growth, which will ultimately be to the benefit of the whole country.

To this end we make four key recommendations:

1. Public and private stakeholders in the north of England should galvanise their efforts to develop and promote transformational infrastructure projects in the North, with a view to bringing them to a national audience.[1]
2. Northern leaders should work together to bring forward a long-term Northern Infrastructure Strategy, including a small number of key transformational infrastructure priorities. This strategy should build on the 'One North' plan for transport connectivity and Rail North body to galvanise collaboration in relation to rail franchising in the North.
3. An incoming government in 2015 should undertake a radical review of the national infrastructure pipeline in order to bring forward plans for a more balanced approach to infrastructure spending in the UK, with greater emphasis on transformational infrastructure projects in the north of England.
4. The current government must move more quickly and decisively to overhaul the existing transport appraisal processes in order to place greater emphasis on the wider economic benefits that might be derived through public investment in key infrastructure projects and to progress transport devolution to combined authorities and other transport bodies.

1 IPPR North has launched a special competition to support this process; details are available at: www.greatnorthplan.com

1.
THE CASE FOR INFRASTRUCTURE

Infrastructure is essential. As the *Economist* puts it, it comprises the 'economic arteries and veins; roads, ports, railways, airports, power lines, pipes and wires that enable people, goods, commodities, water, energy and information to move about efficiently'.[2] Typically, the term refers to physical investments: brick and mortar, concrete and steel, the fibre-optic cables that support connections between places. While this is true, infrastructure also includes other physical assets, such as power stations, which support the electricity and gas networks, and even housing developments, which provide closer links between workers and centres of employment.

These connections are the bedrock of an effective economy, and they function at different scales. Infrastructure is not just about connecting regions to other regions, or countries to other countries. It also works on a smaller scale: businesses need to locate near broadband connections, near accessible utilities such as power and water, and near transport arteries where physical goods can be traded, and they need workers to travel from their homes to their workplace, and on to their customers.[3]

The quality of these connections is important. The countries with the most advanced connections have an advantage over others, and, as the World Economic Forum contends, developed transport and communications systems are an essential requirement for developing economies to access the 'core economic activities and services' of global markets (WEF 2013).

In addition to improved connectivity indirectly supporting economic growth, investing in infrastructure can also directly deliver economic growth. The construction of roads, the laying of fibre-optic cables, and the construction of new housing developments have a direct impact on economic output, creating and supporting jobs through the construction process. Research for the International Labour Organization found that different types of investment deliver more or less intensive job creation depending on the nature and location of the scheme and the methods employed in contracting out the construction (see ILO 2011, Bentall et al 1999).

On the surface, it would appear that the faster and more efficient the connections available in an economy, the easier it will be for businesses and customers to buy and sell products. However, a recent review by the LSE shows that the state of the literature on infrastructure investment is far from unanimous.

> *'This empirical correlation [on the impact of investment on growth] is the subject of considerable heterogeneity depending on the countries and time periods under study, possibly indicating asset quality issues, complementarities with other production factors, non-linearity due to the network character of infrastructure, and larger policy and institutional factors that still need to be better understood.'*
> Bottini et al 2012

We can draw from this that infrastructure investment must be complementary to other investments to achieve its maximum potential, and that there is not an 'off the peg' infrastructure plan available for countries or regions to pick up, expecting it to

2 http://www.economist.com/economics-a-to-z/i

3 For a discussion of the role of housing as wider infrastructure investment see Cox 2014.

deliver ‘X per cent in additional gross value added’. Indeed, while essential, strong infrastructure is just one of a number of economic drivers that are needed to deliver strong economic growth, including investment in skills and workforce mobility, an environment that fosters innovation, and strong and stable political institutions (OECD 2012).

What is also evident is that some places need infrastructure investment more than others, and the potential economic returns on investment will differ on the basis of local skills, business types, and so on. Moreover, there is a limit to how effective additional infrastructure investment can be –as the World Bank explains, investing in infrastructure in places where the economic arteries are of a reasonable standard will be subject to diminishing returns.

> *‘Intuitively, if infrastructure is close to its optimal level, the general-equilibrium growth effect of a marginal addition to the infrastructure stock should be zero, as the direct output impact of increased assets would cancel out with the negative impact of diverting more resources towards infrastructure accumulation.’*
> Servén 2010

The LSE Growth Commission contends that while infrastructure investment is not the only essential factor in securing gains in economic growth, underinvestment in infrastructure can constrain investment in other areas, and limit productivity gains; conversely, while overinvestment or wrongly allocated investment may do no direct *damage* to economic growth, it can nonetheless result in zero benefit (Bottini et al 2012). For instance, Gibbons et al may have identified such a case for a package of road investments in the UK and its impact on firms:

> *‘Overall, the analysis of the combined effect of all major road transport schemes between 1998 and 2003 does not find evidence of positive total factor productivity, labour productivity, or wage changes.’*
> Gibbons et al 2009

The assessment of road investments was, by its own admission, limited to an evaluation of accessibility and its connection to agglomeration, rather than the other feasible benefits, such as reduced journey times. In addition, it was limited to smaller-scale investments, such as link roads, rather than major new motorway schemes, which might be categorised as of ‘national significance’ or ‘transformational’.

Given the UK’s deteriorating position in the WEF infrastructure quality rankings outlined below, the fundamental question is not really one of whether infrastructure investment should occur – rather, it is about getting the right infrastructure in place, at the right scale, and alongside other factors of economic development, to match local and national needs.

A review for the World Bank found that it may be possible to identify where the balance between under- and overinvestment lies.

> *‘[T]ests of parameter homogeneity reveal little evidence that the output elasticity of infrastructure varies across countries. This is so regardless of whether heterogeneity is unconditional, or conditional on the level of development, the level of infrastructure endowments, or the size of the overall population. The implication is that, across countries, observed differences in the ratio of aggregate infrastructure to output offer a useful guide to the differences in the marginal productivity of infrastructure.’*
> Calderón et al 2011

The OECD study reflected further on this, suggesting that targeting investment in poorer regions might lead to stronger general economic effects.

> *'Among the less developed regions, those growing faster than the national average appear to have more infrastructure, better human capital and higher density of activity relative to the underperforming group.'*
> OECD 2012

This is important for the poorer regions of England, which, relative to London and the South East, have enjoyed weaker levels of per capita investment. The Northern Economic Futures Commission concluded that:

> *'The importance of connectivity in enabling growth is clear: cities derive a significant proportion of their prosperity from their accessibility and connectedness. Research carried out by IPEG and CUPS … shows a consistent correlation between areas that have experienced the strongest productivity growth during the past decade and their degree of connectivity.'*
> IPPR North and NEFC 2012

The WEF identified infrastructure as one of its four core pillars of economic development (WEF 2013), and it is apparent that good connections between people and places are essential foundations of economic growth. It also appears that there are different returns on investment, and that places with historically weaker levels of capital investment may be the areas which could deliver the greatest returns on capital investment. This must be a priority for the public purse.

2. PUBLIC INVESTMENT IN INFRASTRUCTURE AND UK PUBLIC POLICY

Historically, the UK has been a pioneer in infrastructure, having achieved giant leaps in connectivity from the rail network to the development of the internet. But although the World Economic Forum ranks the UK among the most competitive economies in the world, its ranking on the quality of its infrastructure is much poorer (28th), with its roads ranked below its general economic position (again, at 28th) and rail (at 14th) (WEF 2013). Furthermore, the UK is slipping down these rankings.

This has not escaped the attention of the UK government, who in advertising their plan for investing in UK infrastructure states that:

> *'Our roads are congested, which costs the economy billions every year, and trains are still overcrowded with hundreds of thousands standing on their commute each day. And lack of housing means the average person is now in their mid thirties before they can afford to own a home of their own.'*
> HMT 2013a

The involvement of the government in the infrastructure debate is essential, and indeed infrastructure investment rarely wholly operates outside of the public sphere. Even in the unusual case that is the UK, which almost singular in the extent to which core infrastructure assets are privatised (Armitt 2013), public institutions are still essential actors in supporting and delivering major infrastructure projects. Major infrastructure projects usually require a lengthy interaction with the planning authorities, and often require significant public money.

The extent of public involvement in supporting infrastructure will depend on a range of factors, including the scale of the project in question, the extent to which private investment can support it (and as a corollary, its need for public money) and the extent to which public policy acts as a barrier to the infrastructure.

The government's approach does in part recognise these different challenges, in setting out four parts to their infrastructure development plan (HMT 2011):

1. a pipeline of public investment in infrastructure worth over £100 billion to 2020
2. policy reforms to stimulate new private sector investment in energy generation, building on the UK's world-leading track record in attracting investment
3. transforming the financing of major projects by the further roll-out and extension of the UK guarantees scheme
4. strengthening public sector delivery of major projects and programmes, learning from successful approaches taken in preparations for the Olympics and Paralympic Games and elsewhere.

In this paper, based principally on the availability of data, we are primary concerned with the question of investment.

Public investment

Public investment in infrastructure depends upon a number of factors, including market conditions, the viability of potential private sector investment, and the extent of privatisation in the market. Research from the United States on regional investment patterns and growth found that public investment in infrastructure had led to a noticeable pick-up in regional economic performance, via increases in private sector investment, productivity and employment (Munnell 1989). 'Output elasticity' provides one measure of the effect of investment on the productivity of affected workers.[4] One study estimates the public capital investments yield an output elasticity of 0.086 (Bom and Ligthart 2009), which accords with broader estimates of returns of 0.07–0.1 (Calderón et al 2011). That's to say, for each percentage point increase in investment, worker output will increase by up to 0.1 per cent.

Yet, in a market economy, it would seem logical that if a government can encourage private investment in infrastructure then it should do so, in order to relieve taxpayers of an additional burden. However, evidence from the UK suggests the relationship is not so simple. A report by the National Audit Office (NAO) found that 'since privatisation of public utilities in the 1980s, new infrastructure investment has increasingly been privately financed and paid for by consumers through their bills' (NAO 2013).

The role of public investment in infrastructure is therefore a central issue. If public money is not being invested in infrastructure, this does not mean that said infrastructure will come at no price – rather, the consumer will pay higher bills. This makes infrastructure investment an important social policy issue, especially given that the NAO has also that found energy and water bills have risen quicker than household incomes, and impose a particular burden on poor families (ibid).

Public investment in infrastructure is therefore necessary for three reasons:

1. to fill a void left by market failure
2. to give confidence to private investors
3. to control the distributional impact of infrastructure investment.

The government is an active participant in the planning of infrastructure, and in supporting it directly or indirectly with investment. To their credit, the Coalition government has assembled a comprehensive list of infrastructure projects that are under construction or planned over the next decade, and their assessment includes the extent to which the public owns and pays for the eventual asset. While imperfect, the data in the national infrastructure pipeline (the 'pipeline') is the most extensive list of planned infrastructure in the UK to date.

The national infrastructure pipeline

The pipeline records 429 different projects across the range of UK infrastructure sectors, including transport, energy, communications and intellectual capital.[5,6] Around 80 per cent of these have defined, projected or agreed funding, and the combined cost of these projects is currently running at over £483 billion (HMT 2014).

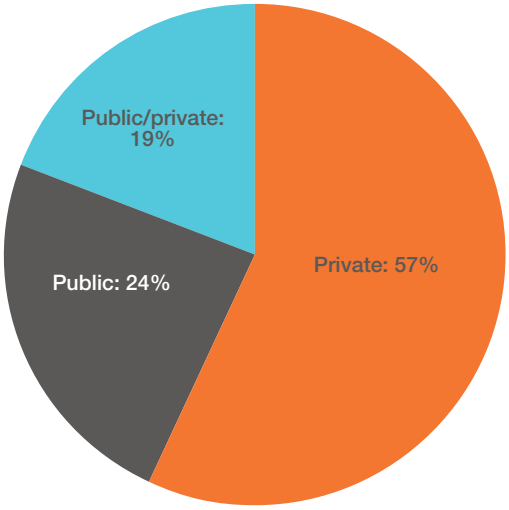
The data (as shown in figure 2.1) illustrates that most of the investment for currently planned infrastructure is drawn from the private sector, but that there may also be some crowding-in effect, where public investment is used to attract additional private investment. For certain areas of infrastructure policy, a combination of public and private capital is quite common.

4 Proportional change in output per worker, divided by investment.

5 Intellectual capital refers broadly to investment in research facilities, such as university laboratories.

6 Notably absent from the pipeline is housing infrastructure investment, although comprehensive accounts of government plans for this can be found with the Homes and Communities Agency.

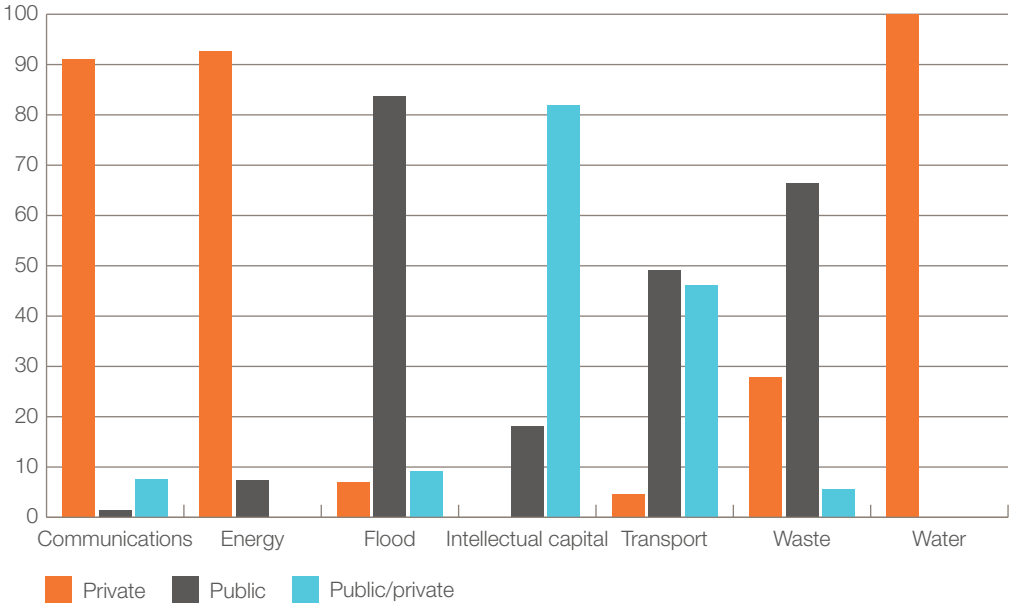
Figure 2.1
Source of pipeline investment (%)



Source: HMT 2014

The division in the value of investment outlined in the pipeline data reflects the unusually highly privatised state of asset ownership in the UK (Armitt 2013). However, the general picture hides a more complex sectoral investment structure, as shown in figure 2.2.

Figure 2.2
Source of pipeline investment, by sector (%)



Source: HMT 2014

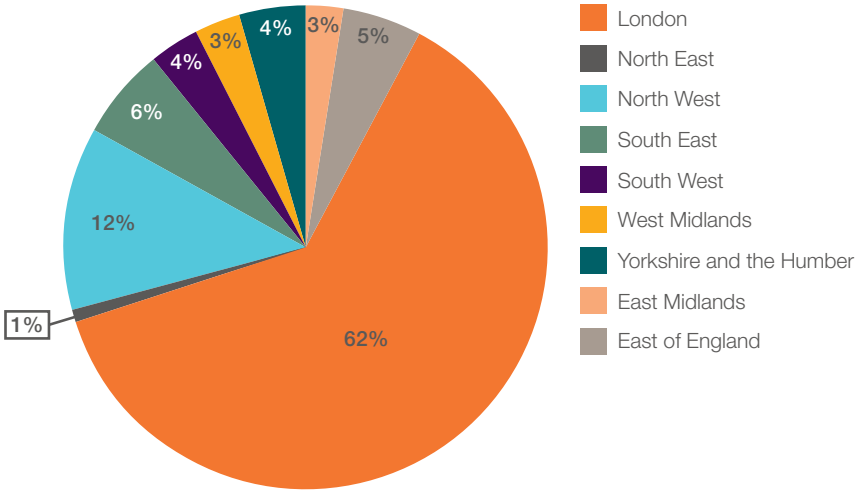
The share of investment taken on by the public purse also appears to depend on the extent of privatisation within that sector. For instance, both communications and water

are fully privatised, and therefore attract only negligible portions of public investment, if any. Private firms in this instance are expected to invest in their own networks.

Transport, by contrast, has only been partly privatised, and the responsibility for managing and updating the rail and road networks remains a public responsibility; likewise, encouraging private investment to invest without public support appears challenging – as it does with intellectual capital projects. Both, however, exhibit strong tendencies towards joint investment, where public money supports private investment.

To take a different view, when expected public spending is assessed regionally, we can see a serious imbalance of public expenditure at work. Figure 2.3 shows the combined value of public-private and purely public investment as a proportion of overall planned investment across England.

Figure 2.3
Share of infrastructure spending where public investment is involved (public-private or purely public)(%)



Source: HMT 2014

While the above does not represent the distribution of planned 'purely public' expenditure, it does show, crucially, where public resources are being used to lever in other resources.

Understanding why spending is so out of balance is principally explained by the number of high-value, potentially transformative investments concentrated in London. This is the subject of the next chapter.

3. DEFINING TRANSFORMATIONAL INFRASTRUCTURE

Small, low-cost infrastructure investments are essential to improving the daily life of UK citizens. Improving a street's access to superfast broadband, for instance, will improve a family's experience of using the internet for everyday tasks; a new link road will make it easier for households in one village to make their daily commute. However, these kinds of small-scale infrastructure investments by themselves will not transform the wider economic landscape.

By contrast, the aim of *transformational* infrastructure investment lies beyond making the lives of businesses and their customers easier. The objective of large-scale investment is to make a significant, observable impact on the economic performance of a whole area. As the World Bank's *Transforming Through Infrastructure* strategy outlines, projects under this banner 'all have in common that they can accelerate growth and even shift clients towards more sustainable development trajectories' (World Bank 2012).

Transformational infrastructure is such that it delivers a large and tangible benefit to the local or national economy that can be identified in empirical studies. For example, the authors of an analysis of a major investment into the Qingzang railway, which connects two of the least-developed provinces of China with the mainline rail network, found that:

> *'[R]esults show that the Qingzang railway stimulated a 33% or so increase in annual GDP per capita in the railway counties. The estimate provides an aggregate effect of the railway on GDP. It includes the direct gains resulting from the decrease in transportation costs of output, intermediates goods, labor, and technology, as illustrated in our theoretical model. It also includes the indirect gains through the railway effect on urbanization, market integration, economies of scale, economies of agglomeration, etc.'*
> Wang and Wu 2012

Based on the work of Calderón et al (2011), the World Bank has highlighted a number of other cases where investing in infrastructure has had potentially transformative effects. For instance, the building of the motorway network between China's major cities increased national income by around 6 per cent, and around half of the economic growth in sub-Saharan Africa can be attributed to new infrastructure investment (World Bank 2012).

Clearly, the north of England is more economically advanced than the examples set out above. Nonetheless, across a large number of measures of connectivity, the north of England is lagging behind the more economically developed parts of the UK and Europe. For instance, data from Ofcom, the communications regulator, illustrates how the north of England, especially the North East, has much poorer access to superfast broadband connections; the same is true of access to '4G' mobile phone technology.[7] Weaknesses in northern transport systems are well recorded, particularly in the rail networks connecting the major cities on either coast

7 See: http://maps.ofcom.org.uk/broadband/ and http://maps.ofcom.org.uk/mobile-services/

of northern England (see for example NWTC 2011, IPPR North and NEFC 2012, Overman et al 2009). The lack of electrification across key east–west sections means that journeys of equivalent distance can take twice as long in the north of England (say, between Manchester and Leeds) as they do in the south (say, between London and Reading) (Grice 2014). Sections of the road network suffer substantial congestion, especially the M62 and A1 (see HA 2014), largely because rail connections across the North are substandard.

Crucially, the OECD's 2012 report highlights the potential impact on regional economies within national economies. In cases like the north of England, the research shows generally that increases in infrastructure investment lead to higher subsequent rates of growth, but that the results are uneven (OECD 2012). The degree of transformation that can be expected of an infrastructure project will therefore depend on the type of investment and, more acutely, on the need for that investment.

The report finds a 'potentially higher impact of additional infrastructure in countries with initially lower levels of provision' and that 'as regions move into high levels of development, infrastructure investment becomes more significant' (ibid). However, for areas they describe as being at the forefront of economic development and innovation, 'the returns from infrastructure investment appear to diminish' (ibid) – that's to say, the stronger the levels of existing economic development and infrastructure density, the weaker the gains from further adding to the capital stock.

Given these potentially greater impacts in terms of economic growth, a strong northern infrastructure investment plan to accelerate growth in lagging regions would help to support the government's objective to geographically rebalance the economy (HM Government 2013). Indeed, the benefits of narrowing the gaps between the poorest and best-performing regions can be of benefit to both, and further support the government's other core economic goal of reducing the budget deficit (IPPR North and NEFC 2012). However, as our subsequent analysis of historic expenditure patterns and future investment plans illustrates, the current investment and policy environment are unlikely to generate the transformation needed.

Major projects: nationally significant infrastructure projects

In seeking a definition of major, potentially transformational projects, the Planning Act 2008 refers to 'nationally significant infrastructure projects' (NSIPs). The definition within the act explains as follows:[8]

> *'In this Act 'nationally significant infrastructure project' means a project which consists of any of the following—*
>
> *a) the construction or extension of a generating station;*
>
> *b) the installation of an electric line above ground;*
>
> *c) development relating to underground gas storage facilities;*
>
> *d) the construction or alteration of an LNG facility;*
>
> *e) the construction or alteration of a gas reception facility;*
>
> *f) the construction of a pipe-line by a gas transporter;*
>
> *g) the construction of a pipe-line other than by a gas transporter;*
>
> *h) highway-related development;*
>
> *i) airport-related development;*
>
> *j) the construction or alteration of harbour facilities;*
>
> *k) the construction or alteration of a railway;*
>
> *l) the construction or alteration of a rail freight interchange;*

8 See: http://www.legislation.gov.uk/ukpga/2008/29/section/14

m) the construction or alteration of a dam or reservoir;

n) development relating to the transfer of water resources;

o) the construction or alteration of a waste water treatment plant;

p) the construction or alteration of a hazardous waste facility.'

Within the subsections of the Planning Act 2008 are definitions of NSIPs categorised by individual infrastructure themes. For example, power stations meet the criteria if capacity exceeds 100 megawatts; airport expansions must cover 10 million passengers per annum or 10,000 air transport movements. It is clear that the term is used in the act more to identify projects that require particular treatment in the planning process rather than in reference to their potential to transform local economies. Categorising projects as NSIPs is designed to streamline the planning system for major projects in order to improve the speed of programme delivery.

The Planning Inspectorate catalogues NSIPs by region, and those currently on the inspectorate's books are tallied in table 3.1.

Table 3.1
Planning inspectorate applications by region

Region	Number of applications
East Midlands	7
East of England	16
London	2
North East	5
North West	10
South East	10
South West	7
Wales	10
West Midlands	4
Yorkshire and the Humber	10
Grand total	**81**

Source: Planning Inspectorate 2014

A cursory analysis of this data suggests that the distribution of NSIPs is weighted most heavily towards the East of England – however these are mainly live applications rather than actual projects on site. Furthermore, unlike in the pipeline data, offshore wind projects are allocated to specific regions of the UK, which helps to explain the high number of projects in the East of England. However, without recording the economic cost or value of the project, the simple counting data is of limited use for understanding the distribution of potentially 'transformative' infrastructure projects.

NSIPs and Planning Inspectorate applications are useful to an extent – however, as economic metrics play no part in determining which projects are designated as NSIPs, their ability to define a project as being 'economically significant', especially within a region or locality, is limited.

Major projects: economically transformational infrastructure

There is no formal definition of economically transformative infrastructure, but it might be viewed as an investment that is large enough to make a significant (or observable) and sustained impact on economic performance. In advanced economies these are difficult to identify; indeed, it is usually associated with low-income countries, as the World Bank contends.

'Increasingly, infrastructure is seen as the vehicle for transforming low-income and middle-income countries. The developmental challenges

> *that these countries face are numerous, ranging from rapid urbanization to catastrophic natural disasters, the threat of a changing climate and environmental conservation goals. To address these challenges, the infrastructure sectors – water, transport, energy, information and communications technology – have emerged as real agents of change.'*
> World Bank 2011

Work is currently underway by the Centre for Urban Policy Studies at Manchester looking at transformational infrastructure, which when complete may provide a more categorical definition.[9]

However, certain building blocks are essential in any attempt to define transformational infrastructure, and potentially in identifying them in the government's pipeline.

The first and most obvious is that the project must have an impact on economic performance. In appraising different pipeline proposals for infrastructure investment, we can define this in a number of ways, as set out below; but the most obvious one is that the level of investment, or the impact of the investment, must be sufficient to have an observable impact on economic performance in the area.

The second feature is that that while projects can either revitalise existing networks or put into place entirely new ones, transformational projects should be broadly required to do the latter. Filling in potholes is beneficial, but not on the scale of the HS2 high-speed rail developments. That does not imply that one should be prioritised over another – and, for instance, electrification of existing rail networks may indeed be transformational – but broadly speaking, a transformational investment is more than merely 'revitalising'.

To summarise, for a project to warrant the title 'transformational', certain criteria would have to be met. The first, part is essential to defining economically transformational infrastructure; the other three offer the potential for wider interpretations of transformational projects if they meet, at a minimum, the first.

1. **Scale:** Does the project have a demonstrable impact on the economic performance of the region, or locality within it that could be picked up in economic data?
   - Does the infrastructure have an impact on potential productivity?
   - Does the building process support enough jobs to make a meaningful impact on employment/unemployment in the area?
2. **Business impact:** Will it observably change the costs of doing business, or the way businesses are operated?
3. **Social impact:** Will it positively affect how people live?
4. **Environmental impact:** Will it support environmental sustainability?

9 For more information, see: http://www.sed.manchester.ac.uk/research/cups/research/projectsummaries/documents/n8.pdf

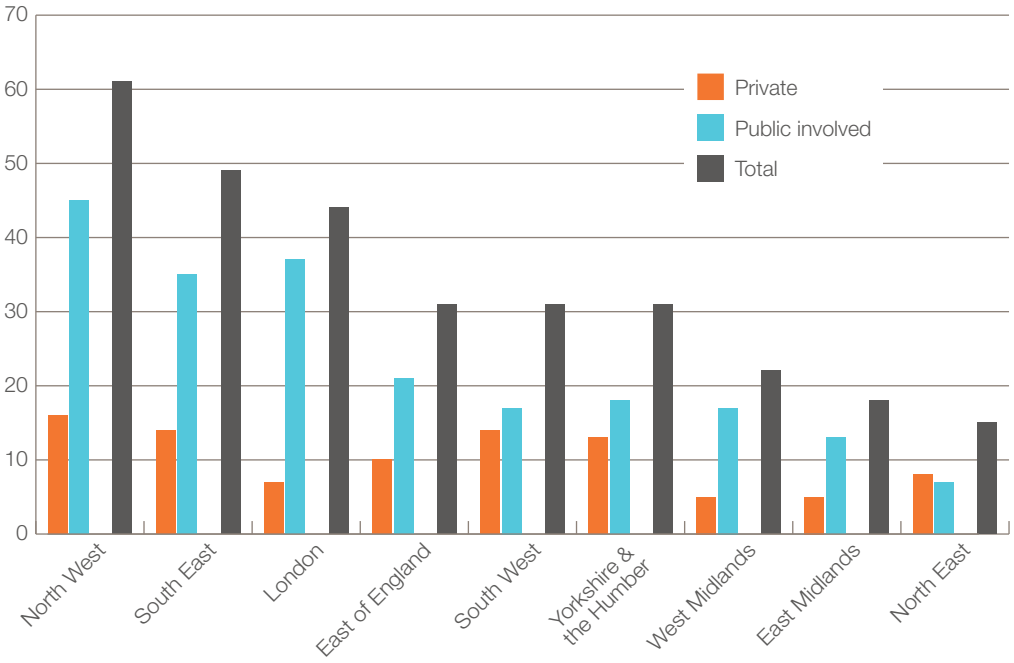
4.
BRITAIN'S NATIONAL INFRASTRUCTURE PLAN

In order to understand more about the size, scale and transformational potential of UK infrastructure plans, we have carried out a fresh analysis of the most up-to-date *National Infrastructure Plan* (NIP) and the 'pipeline' of projects that it covers.

The infrastructure pipeline outlines the number of projects in planning by the region in which they are located. Some infrastructure projects are operate across a number of regions, such as the HS2 high-speed rail development, and so are not allocated by Treasury to any particular region. As a result, these are not included in the regional investment patterns; however, clearly, this should not detract from their potentially transformative nature.

Figure 4.1 outlines the total number of regionally allocated projects, by general funding category, where 'public involved' denotes projects that are wholly ('purely') or partly funded with public money.

Figure 4.1
Total number of regionally allocated pipeline projects, by region and funding model

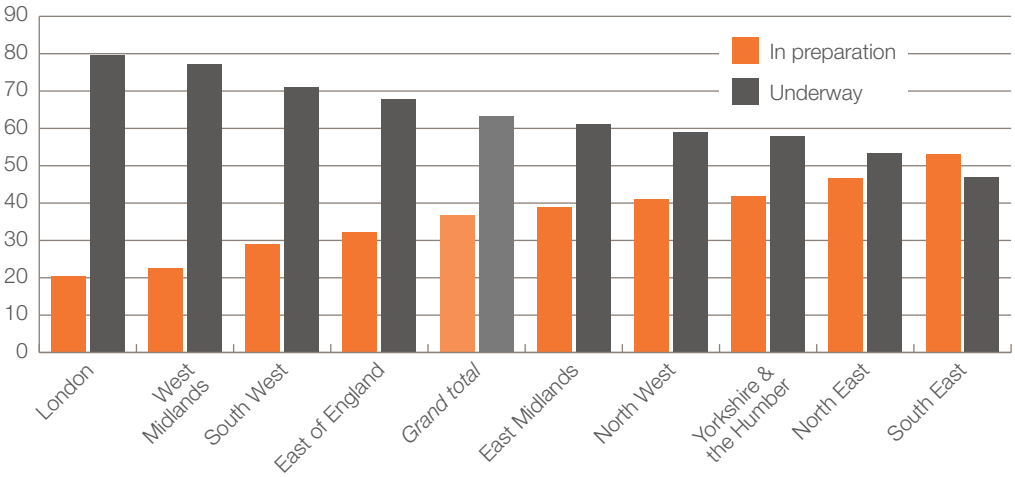


Source: HMT 2014

The data shows that the South East and North West are the leading beneficiaries of NIP projects, with the North West able to attract the most purely privately funded projects. By contrast, the East Midlands, West Midlands and North East host less than 30 projects each.

The pipeline data also tracks the progress of NIP projects, which provides further insights. Each project passes through a series of stages, from scoping, to planning, to 'active', to construction. Figure 4.2 crudely splits regionally allocated projects into two categories for simplicity: 'preparation' and 'underway'.

Figure 4.2
Progress of regionally allocated pipeline projects, by region (%)



Source: HMT 2014
Note: 'Preparation' denotes a project in the scoping or planning stages; 'underway' denotes a project that is 'active' or under construction.

Again, this perspective paints a positive picture for London, and in this case the West Midlands, where over three-quarters of projects have passed the 'shovel-ready' milestone and now in progress. By contrast, the South East and the North East have the lowest share of project actually in progress.

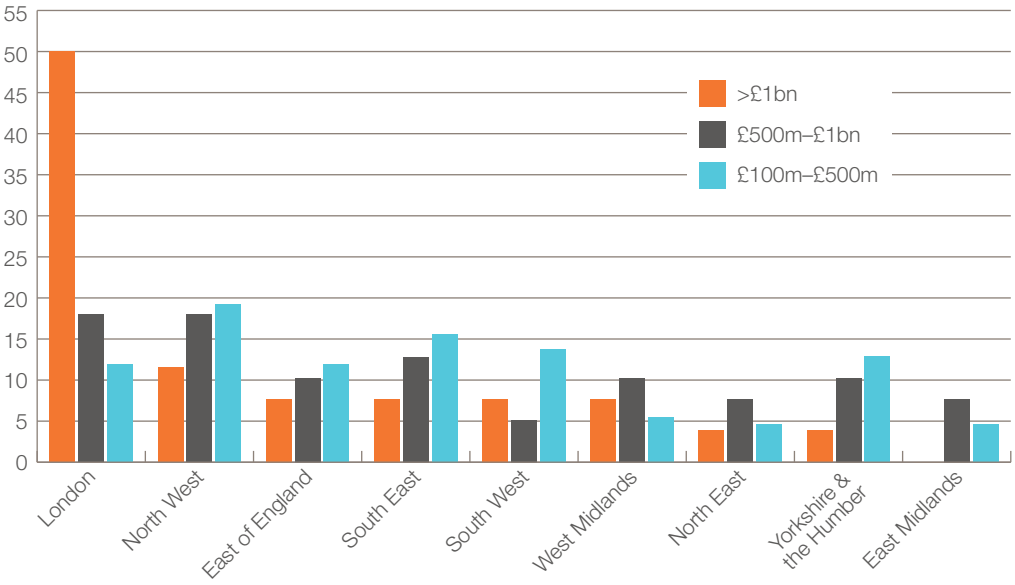
The number of projects and their progress is indicative of the level or intensity of infrastructure activity taking place, but less indicative of either the potentially transformative nature of the projects or the distribution of infrastructure resources across projects. In fact, high-value projects, which in a financial sense might be sufficiently large as to have a regional impact, are concentrated in London and the North West. In terms of the criteria outlined at the end of the previous chapter, cost is a useful if not decisive indicator of scale.

Figure 4.3 shows a breakdown of regionally allocated projects where the costs of a project exceed the value of £100 million, which we have chosen as a threshold representing 'high value'.

This data shows that London overwhelmingly attracts the largest share of the most valuable, billion-pound infrastructure projects (13 projects) and the largest share (with the North West) of the next tier of projects worth over £500 million (7 projects). Even where the project may not serve to be transformational in adding permanently to the labour market or gross value added data, it is obvious that such a large amount of additional capital spending will add substantially to the economy in the short term. No other region has more than three projects where investment exceeds £1 billion.

The share of projects worth between £100–500 million are more equally distributed, with the South East and the North West taking in the largest share.

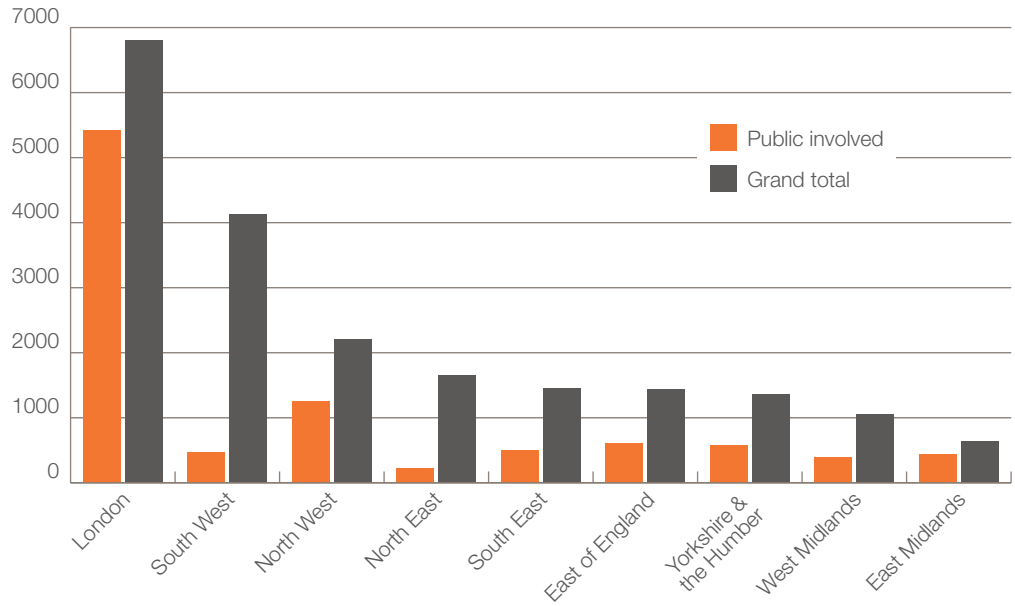
Figure 4.3
Share of high-value regionally allocated pipeline projects, by region and value (%)



Source: HMT 2014

We can balance this financially focused assessment of project value by accounting for regional population. Figure 4.4 shows the value of regional investment per resident, to give an impression of both the total spread of planned investment and the distribution of public resources.

Figure 4.4
Investment spending per capita on regionally allocated pipeline projects, by region and funding model



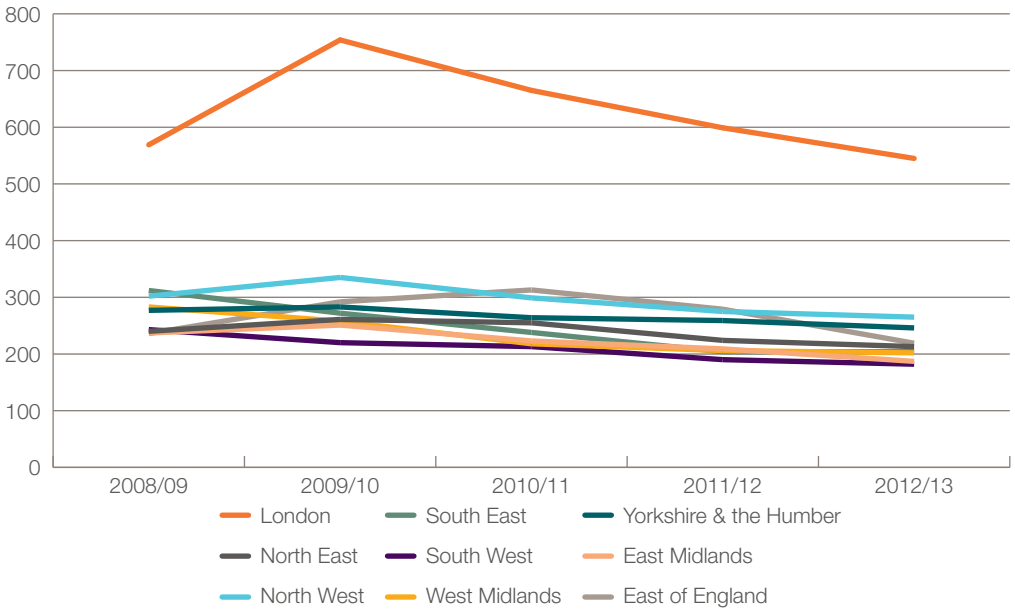
Source: HMT 2014

This data shows major imbalances between London and the rest of the UK. Where public money is used (either wholly, or partially to lever in investment) investment spending in London is £5,425 per resident, compared to the next best, the North West, on £1,248 per resident. The North East, however, sees only £223 of capital spending per resident where public money is involved.

The forces behind these imbalances are, for the most part, investments in major projects. There are 26 regionally allocated projects in the pipeline where investment exceeds £1 billion. The most valuable of these is the £16 billion investment planned for Hinckley Point C, on the banks of the Bristol channel – development of this next-generation nuclear power station makes up 72 per cent of total planned investment in the South West (HMT 2014). Similarly, London is the beneficiary of many high-value projects, such as Underground upgrades (£12 billion across seven projects) and a new Crossrail depot (£1.2 billion), which underpin high investment levels. At the other end of the spectrum, in terms of both total investment and publicly involved investment, the East Midlands attracts very little spending on a per-resident basis.[10]

These kinds of imbalances, both in private and public investment, are illustrative of a wider malaise in public policy, where typically funding is invested disproportionately towards London, away from the poorer regions of the UK (see for example IPPR North and NEFC 2012, Cox and Davies 2013, Cox et al 2014). The expenditure on economic affairs, such as on skills, on research and development for instance, are all disproportionately directed towards the capital; on transport spending in particular, both capital and revenue spending has historically been consumed disproportionately by London, while other parts of the country have received much less, as illustrated in figure 4.5.

Figure 4.5
Public investment spending per capita on transport by region



Source: OTWT 2013, HMT 2013b[11]

10 A degree of imbalance per capita is to be expected, as high land values in London and the south of England generally drive up construction costs.

11 Public Expenditure Statistical Analyses (PESA) reflect historical spending patterns. In this case, to offset criticisms that lower capital investment is offset by higher revenue subsidy, both capital investment and subsidy spending are included in the PESA analysis.

Reversing these historical imbalances requires significant changes in policy, including shifts in priorities and appraisal methods. Our analysis shows that it is not just the number of projects in the pipeline that benefits wealthier parts of the UK. The imbalance is also reflected in the gross capital value of projects, illustrating the relative difficulty for economically weaker regions to attract private – and, crucially, public – capital investment. This is crudely illustrated by calculating an average capital cost of regionally allocated projects, as shown in table 4.1.

Table 4.1
Average value of publicly supported regionally allocated pipeline projects, by region

	Projects	Publicly supported investment (£m)	Average project cost (£m)
London	37	£45,078	£1,218
North West	45	£8,843	£197
East of England	21	£3,625	£173
Yorkshire and the Humber	18	£3,089	£172
East Midlands	13	£2,002	£154
South West	17	£2,531	£149
West Midlands	17	£2,195	£129
South East	35	£4,380	£125
North East	7	£580	£83

Source: HMT 2014

As the table illustrates, the value of projects in London far outstrips the value of investment projects elsewhere in England, especially compared with the North East and East Midlands, for instance, who attract the fewest and lowest-value investments.

However, beyond simple 'scale', few of the billion-pound NIP projects meet the other transformational criteria that we set out in the previous chapter – see table 4.2 for a full list. Many are upgrades of existing infrastructure work rather than entirely new developments, such as the package of London Underground improvements and service plans for water companies. With the exceptions of Crossrail and Thameslink, it is difficult to argue that any of the remainder would be considered truly 'transformational'.

Table 4.2
Regionally allocated pipeline projects with costs exceeding £1 billion

	Theme	Region	Estimated cost, all investment (£m)
Hinkley Point C	Nuclear Power Generation	South West	£16,000
Crossrail	Rail	London	£14,500
Thameslink	Rail	London	£6,500
Thames Tideway Tunnel Main (Thames Water)	Water	London	£4,180
Underground upgrades	Underground	London	£3,793
Thames Water	Thames Water: Sewerage service	London	£3,400
Heathrow Capital Investment	Airports	South East	£3,013
Underground upgrades	Underground	London	£2,998
Elephant and Castle	Remaining Capex schemes	London	£2,790
Underground upgrades	Underground	London	£2,737
United Utilities Water	Water	North West	£2,188
Surface Transport: Other capital	Misc	London	£1,934
Thames Water	Water	London	£1,513

United Utilities Water	United Utilities Water: Water service	North West	£1,384
A14 Cambridge to Huntingdon	Road	East of England	£1,359
Severn Trent Water	Severn Trent Water: Sewerage service	West Midlands	£1,351
Southern Water	Southern Water: Sewerage service	South East	£1,283
Crossrail Depot	Rail	London	£1,215
Anglian Water	Water	East of England	£1,184
Sellafield Power Station	Waste & Materials Management	North West	£1,183
Yorkshire Water	Yorkshire Water: Sewerage service	Yorkshire and the Humber	£1,149
Severn Trent Water	Severn Trent Water: Water service	West Midlands	£1,100
Tees Renewable Energy Plant	Biomass	North East	£1,058
Great Western Electrification	Rail	South West	£1,043
Gas distribution	National Grid Gas - London - RIIO-GD1	London	£1,027
Northern Line Extension	Underground	London	£1,009

Source: HMT 2014

Summary: how imbalances develop

The driver of the substantial differences between the amount of infrastructure investment in the regions of England is often the scale of major projects in each region.

According to the pipeline data, more investment is set to flow into London than into the North East, North West and Yorkshire and the Humber combined. This is driven by a handful of major projects, namely Crossrail, Thameslink and the collection of improvements to the London Underground service. The scale of these investments is colossal: Crossrail alone (at £14.5 billion) will attract more money than the combined sum of infrastructure investment in the North East and Yorkshire and the Humber (HMT 2014).

The capital has a large population and many visitors to utilise its transport, utilities and communications infrastructure. Nevertheless, investing big in infrastructure in London may be counterproductive. For one, investing unequally will only reinforce and widen the gaps between the economic performance of London and the South East (which will benefit heavily from investments such as Thameslink and Crossrail). Put simply, imbalanced investment strategies cannot deliver the rebalanced economy that the government wishes to see.

Second, according to evidence from the OECD, investing in areas where infrastructure is already dense and connectivity levels are already high risks achieving poor value for money. Potentially higher returns on investment in terms of economic growth are available by supporting regions with weaker existing connectivity (OECD 2012). In the British context, there is growing evidence that underinvesting in our second-tier cities acts as a constraint on our national economic potential (Parkinson et al 2012).

London's success in attracting public and private investment is based on an array of reasons that go beyond the political centralism of British government. Indeed, much of its success is based on solid foundations provided by several decades of planning for growth and bringing forward projects with the requisite ambition and scale (Cox et al 2014). By comparison, the fragmentation of decision-making and leadership in the north of England, along with considerable institutional volatility, has made it difficult to deliver the same vision and structured support for major projects. While there are some ambitious projects in the North, as set out in the

following chapter, a wider set of bold proposals and an overarching vision is needed, tied in with a more coherent system of capacity and resources to work them into viable possibilities.

These ambitions have been set back by the abolition of regional development agencies (RDAs), which were at least of the necessary size to contemplate major infrastructure ideas that could support regional and pan-regional growth (see for example NWTC 2011). To fill the institutional and capacity void, cooperation between local enterprise partnerships (LEPs), which are already looking at more local investment strategies, might be one approach; in other areas, a more coherent structure already exists in the form of combined authorities.

While political fragmentation puts local governments at a serious disadvantage in setting out ambitious infrastructure plans, the processes by which major projects are selected also present a challenge to poorer regions with more dispersed populations. The bureaucratic arrangements of appraisal, via cost-benefit analyses guided by the Treasury's *Green Book*, are extremely useful in understanding the direct economic costs, depreciation and payback of projects. However, as argued in previous work by IPPR North (Cox and Davies 2013) and more recently by the Royal Town Planning Institute (RTPI), the application of these methods disadvantages the competing claims on public resources from poorer regions. The RTPI argues that wider metrics, beyond the existing, narrowly structured framework of 'wider economic benefits' included in the appraisal process should be considered (RTPI 2014).

Ultimately, it is 'big projects' that are driving the big differences in investment levels – if the North is to compete with Crossrail and the other major investments that are tilting the infrastructure balance firmly in London's favour, a coherent set of viable alternatives need to be ready, capable of competing with the vision and ambitions of the more coherent demands of the capital.

5.
TRANSFORMATIONAL IDEAS FOR THE NORTH OF ENGLAND

The deep imbalances in infrastructure investment risk exacerbating other regional imbalances in the UK economy. Furthermore, for every commonly recognised problem (as outlined in chapter 3), there are other, more fine-grained connectivity issues and long-term planning issues that are less thoroughly evidenced and less widely known.

Local enterprise partnerships (LEPs), via their authorship of strategic economic plans, have begun to map out localised infrastructure deficiencies in more detail. However, for transformational projects to occur that can deliver pan-regional benefits, a more systematic approach to the identification of infrastructure problems and solutions will be required.

Certainly, the needs for major investment in northern infrastructure are there, to prevent the economic performance gap between the wealthier and poorer parts of the UK growing further, but the ideas that will deliver the improvements need more attention. This chapter outlines a variety of projects, drawn from a range of sources, that have the potential to transform small or large economies in the north of England.

A survey of existing infrastructure ideas

> Middlesborough Rail Electrification

Electrification of the rail line between Middlesbrough and Darlington, alongside the introduction of direct trains between Middlesbrough and London.

Potential merits: Significant improvements to the currently very poor and slow rail links between Middlesbrough and the rest of the country, and to North East connectivity.

Potential issues: It would have to occur in tandem with improving the existing infrastructure in Darlington.

Costs: Costs of electrification are estimated to be between £800,000 and £3 million per mile, so the costs of electrification could be approximately £75 million.

> High Speed North

A proposed extension and complement to the HS2 network to create a collection of cities to rival the power of London.

Potential merits: Close the 'Y' gap of the high-speed rail network, substantially improving the speed of journeys from the North West to Yorkshire and Humber, principally between Manchester and Leeds.

Potential issues: Northern Hub project addressing some of the problems, which may limit case for further investment.

Costs: The project occurs in around five stages and includes an aspect of the '20 Miles More' proposal; total cost around £3–5 billion.

> Durham Tees Valley Airport

An investment in additional hangar space for the airport, among other proposals including 400 new homes.

Potential merits: Could transform the fortunes of the airport and surrounding areas.

Potential issues: Projections by the Department for Transport (DfT) predict very limited growth in passenger volumes; the economic viability of the airport has been challenged by the recession.

Costs: Approximately £280 million

> HS2 Water Pipe

A proposed pipeline to transport water from north-west to southern England, built at the same time and along the same route as the HS2 high-speed rail development.

Potential merits: The North West has larger supplies of fresh water than other parts of the country, particularly the South East: a pipeline could redistribute supply to water-shortage areas, both generally and in periods of drought. Using the HS2 route would save on land procurement and planning costs.

Potential issues: It is disputed whether water supplies are plentiful in the North. Transporting water over large distances is extremely energy intensive, and cheaper alternatives are available.

Costs: Approximately £2.7 billion for the pipework (excluding land purchase)

> Humber Barrage

A hydroelectric power station driven by tidal movements in the Humber estuary.

Potential merits: Harnesses infinite source of renewable energy.

Potential issues: Humber case is weaker than for the Mersey (as below), on account of differences in tidal forces; like other renewable sources, energy production is limited to part of the day (albeit predictably so). As with the Mersey proposal, the business case is challenging, with return on investment many years away. Potential risks to ecosphere.

Costs: Unknown

> Mersey Barrage

A hydroelectric power station driven by tidal movements in the Mersey estuary.

Potential merits: Harnesses infinite source of renewable energy.

Potential issues: Business case is challenging; return on investment is many years away. Potential risks to ecosphere.

Costs: Approximately £3.5 billion

> Atlantic Gateway

A collection of developments along the banks of the Mersey and leading to the Manchester ship canal.

Potential merits: Redevelopments would stimulate port activity; investment is of sufficient scale to have a major impact on employment.

Potential issues: Cross-LEP proposals will require long-term coordination between regional actors.

Costs: £10 billion or more

> Wifi North

Enabling free wireless internet access across major northern towns and cities.

Potential merits: Improved productivity by allowing for more business activity to take place on the move and in public spaces; helps to foster digital inclusion.

Potential issues: City wifi networks often have poor connection speeds and may be commercial unviable.

Costs: Unknown

> Airport City (Manchester)

Expanding Manchester's airport capacity to include a freight terminal and improve access.

Potential merits: DfT/BAA projections suggest air passenger demand for Manchester is projected to double by 2050, requiring a commensurate expansion in airport capacity.

Potential issues: Increased air traffic is environmentally damaging.

Costs: £400–£650 million

> 'Sandscaping' Northern Coastlines

Landscaping at-risk coastal areas by shifting around large quantities of coastal sand, to prevent erosion of coastlines and support flood defences.

Potential merits: Such schemes can not only protect the viability of at-risk coastal towns but also attract tourism into the area.

Potential issues: Untested in the UK, and so may have environmental impacts.

Costs: Untested in UK

> Soft Airport Infrastructure

Purchasing of slots for take-off and landing of aircraft for regional airports to access major international hubs, such as Heathrow.

Potential merits: Improved connectivity of regional airports.

Potential issues: Increased air traffic is environmentally damaging, especially air travel within the UK, where other modes of transport are available.

Costs: Costs vary widely – American Airlines paid around £20 million for a pair of take-off and landing slots.

> House of Lords North

Move the House of Lords, the second chamber of the UK parliament, to the north of England.

Potential merits: Deliver a cultural shift within a national institution, akin to the BBC's move to Salford.

Potential issues: Transferring institutions is costly; opposition from House of Lords membership.

Costs: Unknown

> 20 Miles More

Extending the agreed HS2 high-speed rail network to Liverpool.

Potential merits: Supporters argue that Liverpool will miss out on the connectivity advances delivered by the agreed HS2 plan. Building '20 miles more' into Liverpool would make further cuts to Liverpool-to-London journey times and allow for the redevelopment of Lime Street station and the surrounding area.

Potential issues: The Merseyside area will already see significant time savings from the deployment of HS2 to Manchester, raising questions about the value for money of additional expenditure, particularly in light of other improvements through the Northern Hub.

Costs: £1.5–£2.5 billion

> Whinthorpe Garden City

A proposed garden town / city for York, developing approximately 450 acres to support 5,500 new homes.

Potential merits: New developments could potentially relieve affordability pressures in the York housing market and create construction jobs.

Potential issues: Staunch local opposition; some necessary additional infrastructure is still to be planned.

Costs: Unknown

> A1 Dualling

Turning the A1 north of Newcastle and through Northumberland into a dual-carriageway.

Potential merits: Significantly improved connectivity between the North East and Scotland, with reduced congestion and delays on a heavily used major artery.

Potential issues: The Highways Agency has supported the project in principle but may require collaboration between the Scottish and Westminster governments to achieve best outcome – the current political climate makes this challenging.

Costs: Unknown

Getting on the front foot

Whether these projects are the right ones or not matters, and few of them have been subject to the kind of scrutiny necessary to evaluate their full costs and benefits. However, they demonstrate that ideas for transformative northern infrastructure projects do exist. IPPR North is conducting further work to widen the net on northern infrastructure ideas, to be published before Christmas 2014.[12]

The north of England, in order to compete with other interests in the Westminster system, needs a strong set of coherent infrastructure proposals to sit alongside ideas and plans for investment. Chancellor George Osborne's suggestion of a new HS3 high-speed rail development, to support 'Not one city, but a collection of cities – sufficiently close to each other that combined they can take on the world', is one such example (see Osborne 2014). To stay on the front foot, however, ideas need to bubble up from the political and economic structures of the North – local governments, the combined authorities and LEPs – to ensure that major projects reflect the long-term strategic needs and interests of northern places.

12 For more information, see: www.greatnorthplan.com

6. CONCLUSION AND RECOMMENDATIONS

Infrastructure is an essential building block of economic growth. Rapid national and international links are key to competing in the global economy – driving productivity and business efficiency by shrinking the time it takes to get people and goods from one place to another.

As the UK slips slowly down the international infrastructure rankings, there is a clear need to reverse the pattern of chronic underinvestment and to take a long-term view of the state of connectivity. All regions of the UK have their own calls on infrastructure spending, but some have proven better at demonstrating need than others – where major investment has occurred, and is occurring, the balance of investment has been skewed heavily towards London.

Investing in London is a short-term fix but creates a long-term problem. OECD research shows that money invested wisely in weaker economic regions can deliver higher rates of return through economic growth than investing in areas that need it less (OECD 2012). In spite of this, London is the overwhelming beneficiary of public funding into infrastructure, and the deep investment imbalances and resulting 'infrastructure gap' between the wealthier and poorer regions of the UK will be only reinforced by current investment plans.

Such imbalances are counterproductive and need correcting. To do so, the political and policy environment needs to be realigned. This is not to call for high-value projects to be immediately abandoned. Rather, in the planning of future capital projects, a different approach is necessary.

To this end we make four key recommendations:

1. Public and private stakeholders in the north of England should galvanise their efforts to develop and promote transformational infrastructure projects in the North, with a view to bringing them to a national audience.[13]
2. Northern leaders should work together to bring forward a long-term Northern Infrastructure Strategy, including a small number of key transformational infrastructure priorities. This strategy should build on the 'One North' plan for transport connectivity and Rail North body to galvanise collaboration in relation to rail franchising in the North.
3. An incoming government in 2015 should undertake a radical review of the National Infrastructure Pipeline in order to bring forward plans for a more balanced approach to infrastructure spending in the UK, with greater emphasis on transformational infrastructure projects in the north of England.
4. The current government must move more quickly and decisively to overhaul the existing transport appraisal processes in order to place greater emphasis on the wider economic benefits that might be derived through public investment in key infrastructure projects and to progress transport devolution to combined authorities and other transport bodies.

13 IPPR North has launched a special competition in order to support this process. Details are available on www.greatnorthplan.com

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