GREATER RETURNS

TRANSPORT PRIORITIES FOR ECONOMIC GROWTH

London First

CONTENTS

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INTRODUCTION

Britain faces a record fiscal deficit. Business believes that as Government starts to balance the books it is vital that its approach is based on supporting sustainable economic growth or, at least, doing as little damage as possible.

Infrastructure investment is vital to this growth. The OECD has set out how investment in physical infrastructure increases long-term economic output more than any other kind of physical investment[1].

This report, underpinned by analysis commissioned from Deloitte and Peter Brett Associates, looks at the contribution of transport investment to growth and the way in which schemes should be prioritised by Government.

A clear framework is needed for judging which transport expenditure is most likely to yield the greatest contribution to sustainable economic growth in the UK. This framework needs consistently to capture a scheme's likely impact on GDP[2] and incorporate it into the scheme's Benefit Cost Ratio (BCR) - alongside direct benefits to users - such that the economic benefit of all transport spending can be assessed on a like-for-like basis.

There will of course be other objectives for transport policy beyond maximising growth. They include carbon reduction, which will be spurred by consistently pricing carbon across all investment decisions. The challenge for transport policymakers is to prioritise limited resources and secure the best returns. In the current fiscal climate, the highest priority should be given to transport investment most likely to sustain growth.

THE IMPACT OF TRANSPORT ON THE ECONOMY

The OECD considers that investment in physical infrastructure increases long-term economic output more than other kind of physical investment[3]. This is reflected globally in the recent increase in support amongst businesses for infrastructure projects as a means of boosting economies, a greater increase in support than that for tax rebates or other financial measures[4]. As the OECD notes, "capital expenditure can be quarantined from the expenditure rules as these are typically the first victim of fiscal consolidation efforts while less productive but politically sensitive programmes survive."[5]

A wealth of empirical research and academic studies – including the UK Government's Eddington Study[6] – shows a strong correlation between transport and economic activity.

Transport can impact overall economic output (GDP) in two key ways:

- **inputs used** – for example, transport can increase employment from greater access to labour or the creation of new jobs, and
- **productivity** – for example, by the increased efficiency of shorter journeys or by greater labour mobility that delivers larger returns on investment in skills.

There is consensus that, while it may be difficult to calculate, transport can affect the rate of growth in GDP through its impact on the agglomeration of economic activity, as well as the generation of trade and foreign direct investment. Large cities can play a central role in driving the economic performance both of their wider regions and the smaller cities within them[7] – providing there is sufficient infrastructure to connect them.

Location matters

The impact of transport investment varies significantly according to the characteristics of the economy and area in question. There are examples of countries and regions that have enjoyed economic success without significant improvements to transport. Equally, there are examples of transport demand outpacing supply, such that congestion constrains growth and underpins the case for investment to increase capacity.

In mature economies with existing transport networks, the relationship between transport and economic growth is likely to be incremental[8]. In the UK, economic benefits are closely linked to the performance of the current network (against demand, as well as levels of congestion and reliability), and, above all, to the characteristics of the region in question.

In other words, generating an economic return from a transport investment depends on the right set of conditions. These include signs that the underlying demand for transport exceeds supply (through, for example, congestion), and evidence of growth and productivity (high wages and land prices, for example). High population and employment densities and deep labour pools are also critical components. With them, and in the right place, transport enables and supports growth, and generates productivity benefits. Equally, for these reasons, transport investment will not generate economic returns everywhere.

Economic returns – the critical measure

Quantifying the impacts of transport investment is complex. Government has a sophisticated and well-regarded methodology for capturing the direct benefits to users – so called 'welfare benefits', such as journey time savings[9]. But it has yet to implement a consistent and comprehensive assessment of the wider economic benefit of many large-scale programmes (the components of which are discussed further below).

To understand the costs, welfare benefits and economic returns – and the relationship between all three[10] – we reviewed a sample of 17 transport schemes[11] (see Figures 1 and 2).

Our analysis shows that welfare benefits outweigh costs in all cases. There are no doubt many more schemes showing similar results. However, given the state of public finances, it is unlikely that investment in all transport projects with a net positive value will proceed, let alone all those that are seen as socially desirable.

Given the Government's need to prioritise limited resources, it is essential to measure not only the welfare benefits but also the wider impacts of investment on the economy and growth. The value of productive capital infrastructure expenditure will need to be captured with a credible, transparent and consistently applied framework for prioritising transport projects based on their long-term contribution to the economy.

Our review of schemes shows the combined wider economic benefit of this infrastructure delivers £34bn to the economy, although these benefits vary considerably[12] across projects and geographies, both in absolute terms and as a proportion of cost, and are not consistently captured in calculations.

Results also showed that, as a proportion of welfare benefits, wider economic benefits are higher in major urban centres.

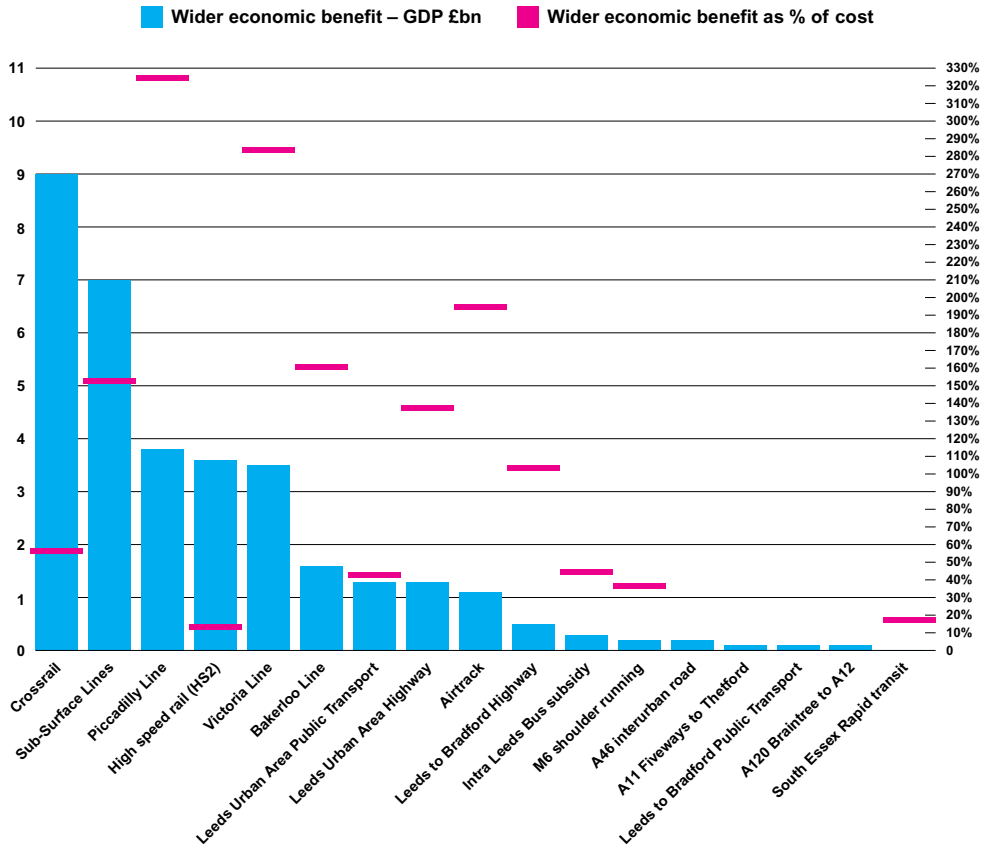


Figure 1
REVIEW OF TRANSPORT SCHEMES – WIDER ECONOMIC BENEFIT (GDP – £BN), ABSOLUTE AND AS A PERCENTAGE OF COST

Note: Cost figures (and therefore WIs as percentage of cost) were unavailable for Leeds to Bradford Public Transport; A46 interurban road; A11 Fiveways to Thetford; A120 Braintree to A12.

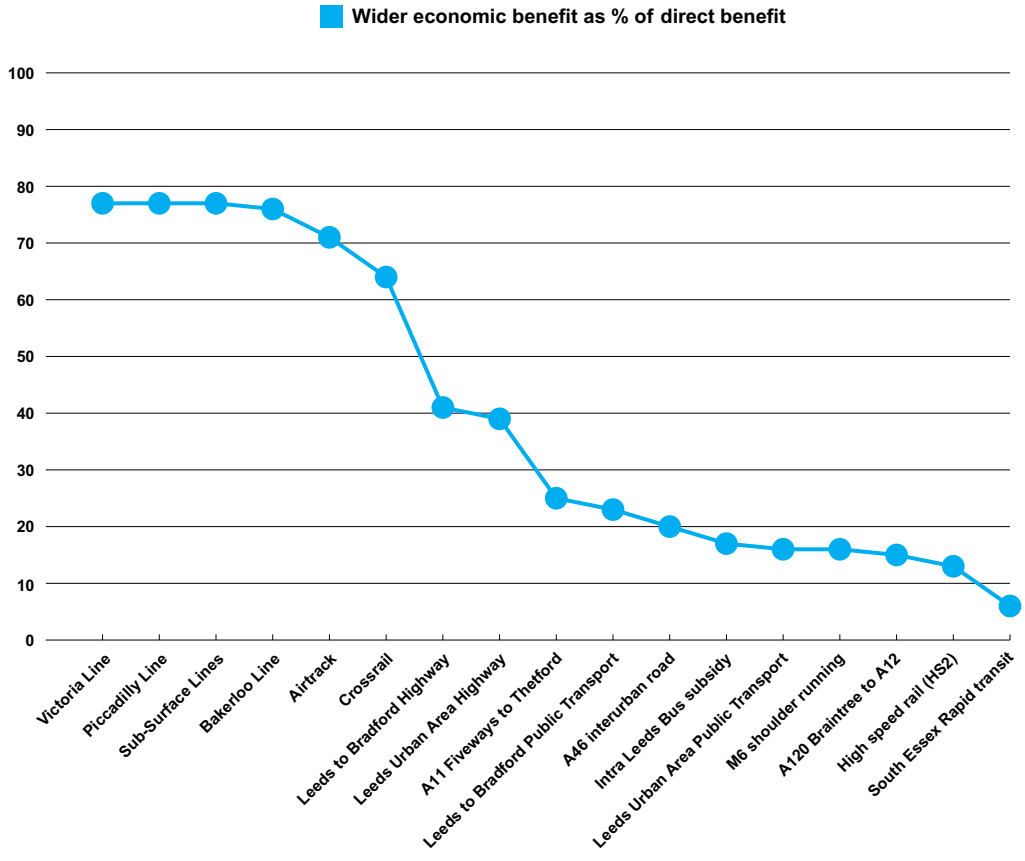
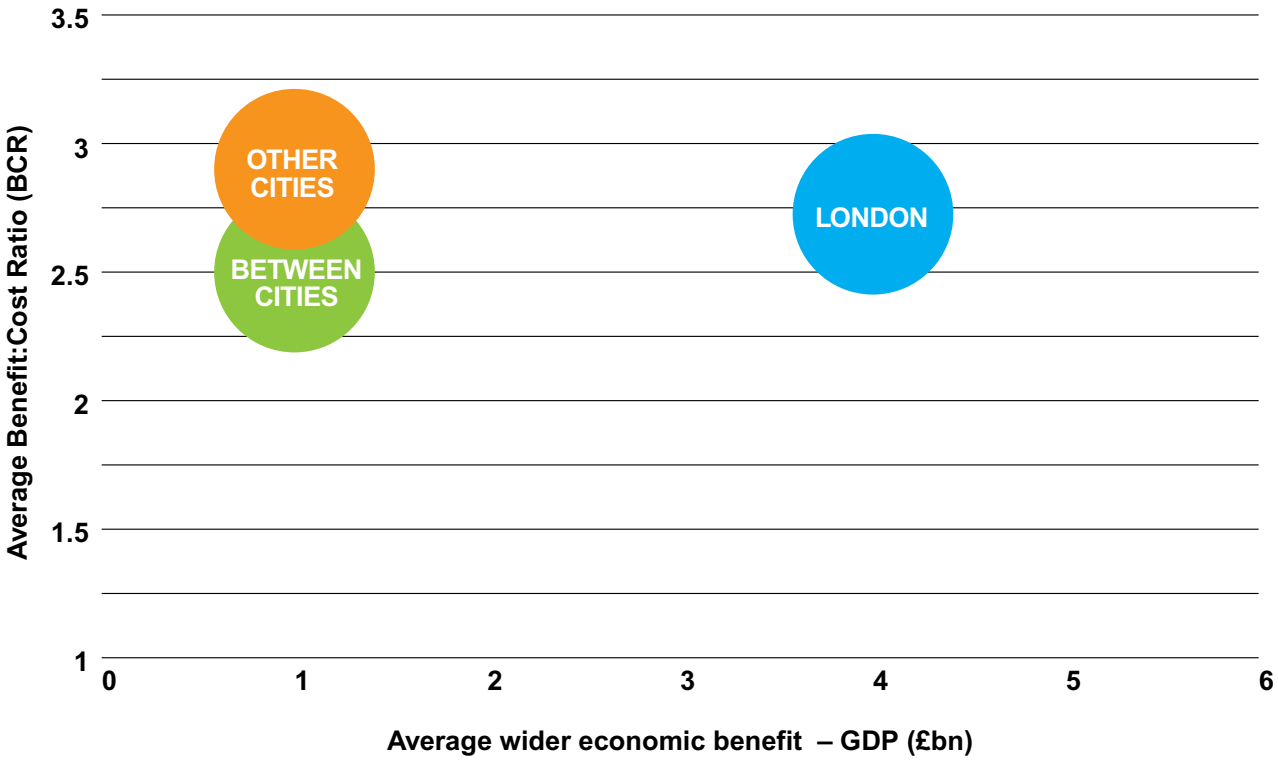


Figure 2
REVIEW OF TRANSPORT SCHEMES – WIDER ECONOMIC BENEFIT (GDP – £BN) AS A PROPORTION OF WELFARE BENEFIT

Schemes in London have a lower ratio of welfare benefits to costs than schemes in other cities: on average a BCR of 2.7 to 1 as against 2.9 to 1 (from the centre of the discs in Figure 3). This reflects the high cost of transport infrastructure in London which is driven by scheme complexity, up-front congestion costs, opportunity costs and higher prices.

Figure 3
TITLE: REVIEW OF TRANSPORT SCHEMES – AVERAGE BENEFIT COST RATIO VS WIDER ECONOMIC BENEFIT



Note: Cost figures unavailable for Leeds to Bradford Public Transport; A46 interurban road; A11 Fiveways to Thetford; A120 Braintree to A12.

If judged by welfare benefits alone, London schemes are therefore likely to be undervalued. The wider economic benefit of this infrastructure is significant, but currently not captured in BCR calculations.

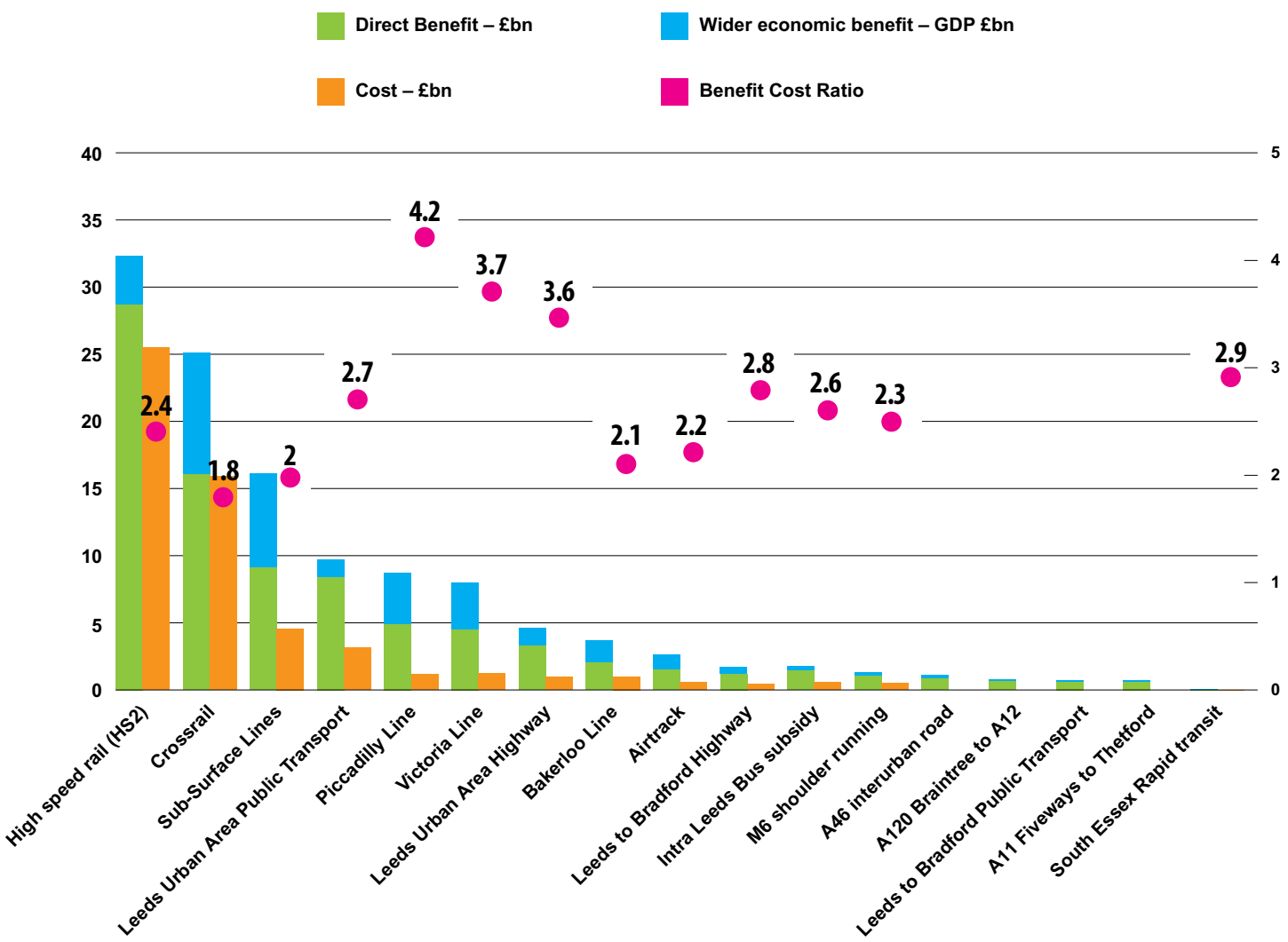


Figure 4
IMPACT OF TRANSPORT SCHEMES – WELFARE BENEFIT, WIDER ECONOMIC BENEFIT (GDP), COST, BENEFIT COST RATIO

Note: All figures 2002 present value (other than High speed rail HS2). Crossrail: figures are based on the low/February 2005 scenario in the 2007 business case. Costs expressed as outturn costs. The BCR calculation takes account of revenues.Airtrack: provisional figures (source: Heathrow Airport Limited). High speed rail (HS2): 2009 present value. Costs expresses as total capital costs. BCR calculation takes account of operating costs and revenues. Cost figures (and therefore BCRs) were unavailable for Leeds to Bradford Public Transport; A46 interurban road; A11 Fiveways to Thetford; A120 Braintree to A12.

CALCULATING THE ECONOMIC IMPACT OF TRANSPORT INVESTMENT

The Department for Transport (DfT) has developed, and continues to improve, detailed guidance for calculating the costs and benefits of transport expenditure, based on the Government's Green Book. But whilst the methodology for capturing welfare benefits is well established, DfT has yet to implement a consistent and comprehensive assessment of the wider economic benefit – the total impact on GDP – from many large-scale programmes.

DfT does not request that wider economic benefits – or 'Wider Impacts' (WIs) – be assessed for schemes costing less that £20m (recognising the need for proportionality in the appraisal process[13]). For schemes costing over £20m, DfT requests that only certain WIs be calculated[14]. It does not require the assessment of the largest component of WIs – agglomeration impacts – unless a scheme falls within, or close to, those parts of England it designates as dense urban areas (Functional Urban Areas – see Figure 5). In practice, WIs are not uniformly included in the assessment of all schemes falling in these Functional Urban Areas.

Moreover, DfT does not permit a scheme's wider economic impacts to be incorporated into its final Benefit Cost Ratio (BCR). Without systematic incorporation of WIs into BCRs, a comprehensive comparison of transport investments' contribution to the long-term, sustainable growth of the economy will be hobbled.

As defined by DfT, the wider impacts of a transport scheme – delivering increased GDP – fall into four types:

Increased output in markets with imperfect competition

The benefit an improvement in transport generates in markets that are not 'perfectly competitive'. While in some markets competition is fierce, in most cases it is not and can lead to higher prices and lower production than is efficient. If improved transport generates cost reductions allowing firms to increase production or output, consumers of those goods and services will value any increases in production by more than the marginal cost of producing it.

Improved labour supply

The impact of better transport (reducing the time and cost of commuting) on the creation of a larger pool of labour, more entrants to the labour market and a move to more productive jobs. In the calculation of WIs, these are additional benefits that specifically accrue to the Exchequer in tax revenue.

Increased competition

In a mature economy such as the UK's, this impact is negligible. There is little evidence to be found on the relationship between transport and competition. It is not expected to be significant[15] and is therefore excluded from most calculations of WIs.

Agglomeration impacts

The largest components of WIs – agglomeration impacts – are increases in economic output created by transport improvements in dense urban areas. A dense concentration of economic activity, businesses and workers creates cost reductions, high levels of productivity, knowledge spillover and efficiency gains. Greater returns are generated from transport investment in areas that, all else equal, have a high employment base (in absolute terms), high employment density, more productive workers and more concentrated activity in productive sectors.

DfT demarcates those places as Functional Urban Areas, which are shown in Figure 5.

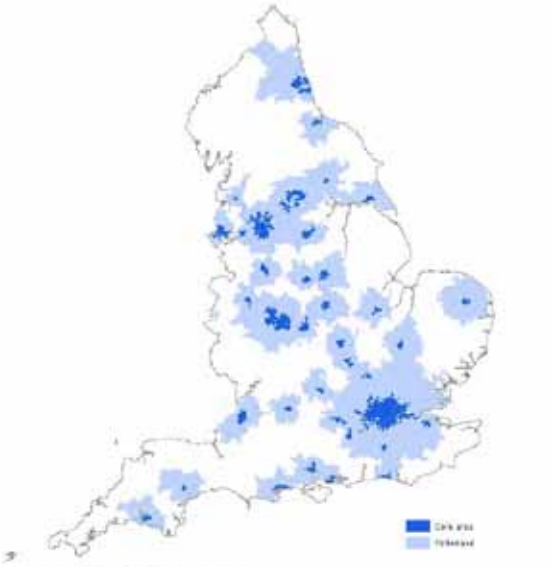


Figure 5
FUNCTIONAL URBAN AREAS (DEFINED BY DfT)

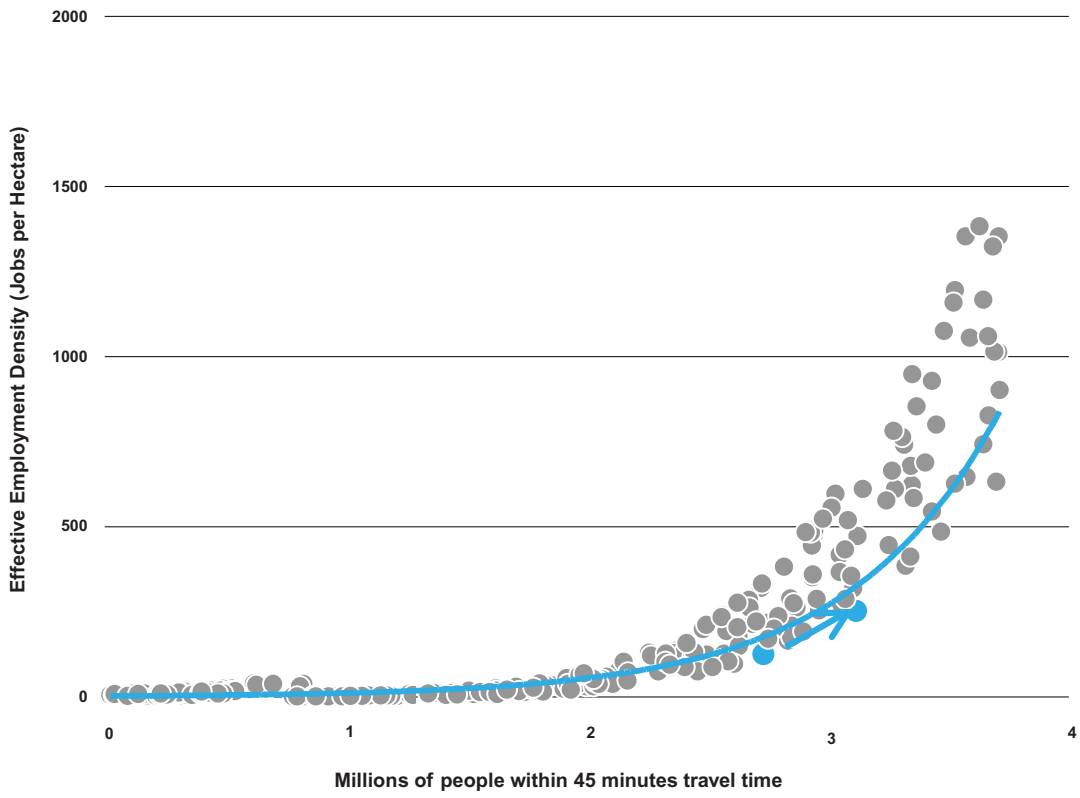
Source: Office of National Statistics, Super Output Area Boundaries

Agglomeration impacts are pronounced in London and its hinterland. Most industry groupings are a quarter to a third more productive in London when compared to the UK average for that industry[16]. A third of all of London's employment occurs in the Central Activities Zone[17], and contributes disproportionately to the UK's GDP. Inner London contributes 14% of the UK's GDP, and of this Westminster and the City of London alone contribute 4%[18].

Although transport investment cannot in itself generate agglomerations, it can facilitate their expansion, by increasing the catchment population and thereby the employment density. Employment density increases more by a given increase in catchment population – through a reduced journey time – if density is already high. The relationship is non-linear (see Figure 6).

Figure 6
RELATIONSHIP BETWEEN EMPLOYMENT DENSITY AND CATCHMENT POPULATION

Reproduced from Colin Buchanan and Partners.



PRODUCTIVITY RETURNS

Following DfT's own appraisal methodology, we calculated the agglomeration impacts of a hypothetical transport scheme that shortens journey times by 10%[19]. The hypothetical scheme was modelled in eight locations across the country, in each case linking six contiguous Local Authority Districts[20] (see Figure 7). Calculations take into account, amongst other things, the cost of travel between each zone, the effective employment density for each Local Authority District and the relevant elasticity of productivity for each sector.

Our results show that, all things being equal, the economic return on investment is greatest in large, dense cities (Figures 8, 9 and 10).

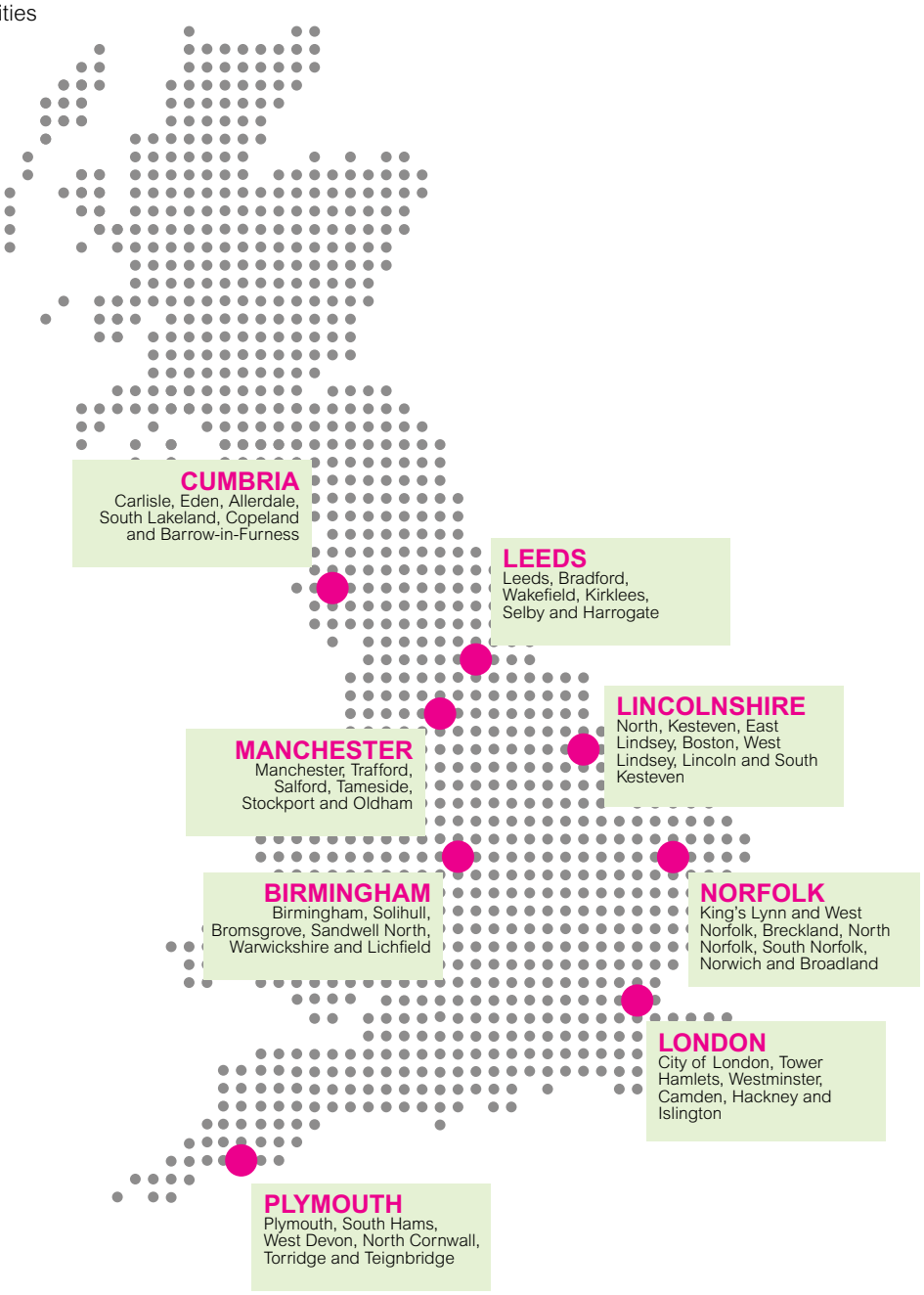


Figure 7
LOCATION OF HYPOTHETICAL SCHEME – AGGLOMERATION BENEFITS COMPARED (2006)

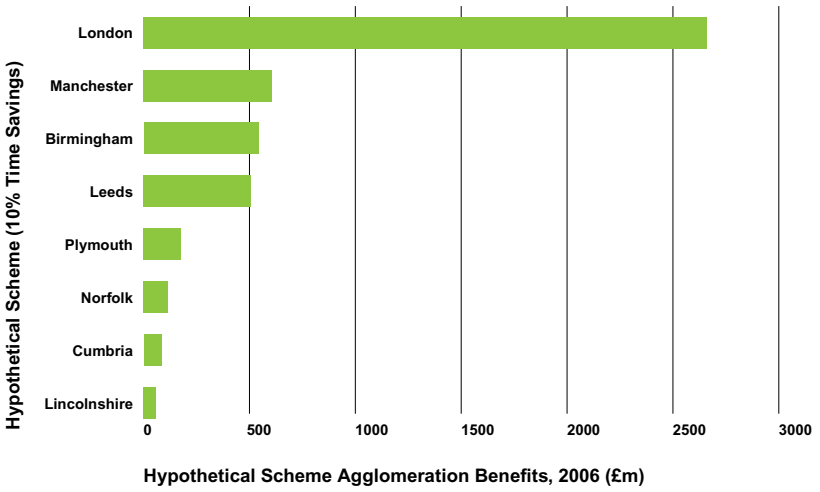


Figure 8
HYPOTHETICAL SCHEME – WIDER ECONOMIC BENEFIT WITHIN CITIES/REGIONS, 2006 – GDP (£BN)

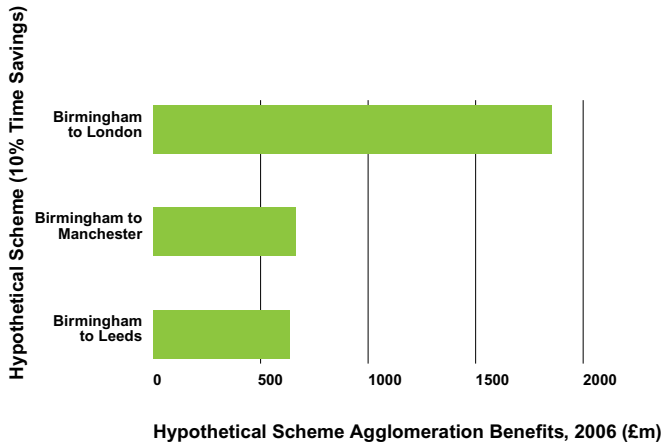


Figure 9
HYPOTHETICAL SCHEME – WIDER ECONOMIC BENEFIT BETWEEN CITIES, 2006 – GDP (£BN)

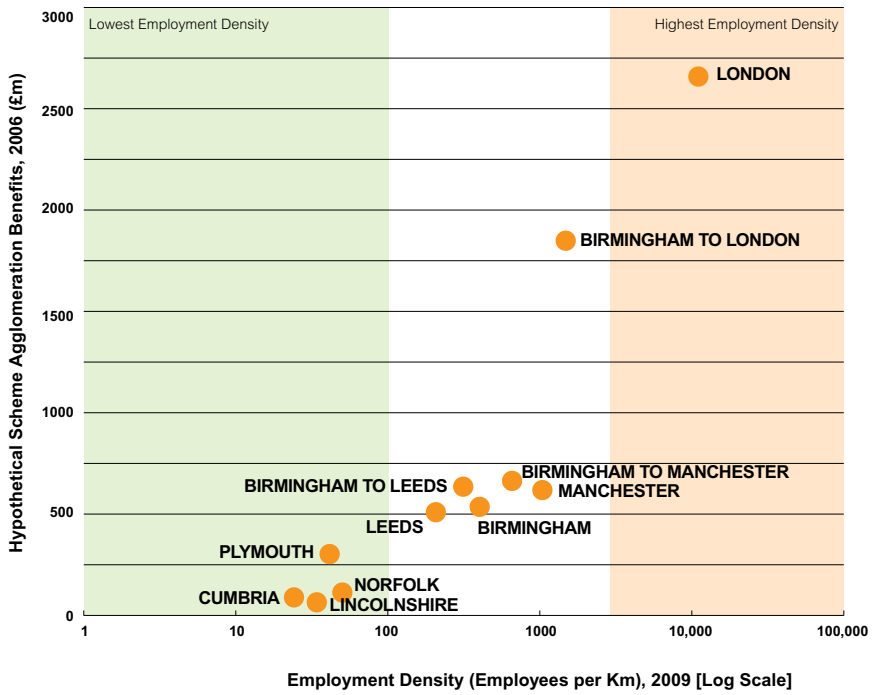


Figure 10
HYPOTHETICAL SCHEME – WIDER ECONOMIC BENEFIT WITHIN CITIES/REGIONS, 2006 – GDP (£BN) VS EMPLOYMENT DENSITY

CASE STUDY – LONDON

The majority of wider economic impacts from transport investment accrue from agglomeration and are reinforced by the other components described above. Examining the DfT's methodology for calculating WIs, we make some key observations:

Employment
The greater the increase in effective employment density brought about by transport improvements, the greater the increase brought about by the productivity elasticity[21], the higher the associated WIs. Major urban areas have higher employment density and are likely to realise greater increases through improved transport provision. When calculating the welfare impacts to users of transport schemes, productive elasticity is applied to the number of people making trips. In contrast, when assessing WIs, productive elasticity is applied to the number of workers – so areas with more workers will see a higher aggregate value of benefits.

> London's population is 7.7 million, estimated to rise to 8.89 million by 2031. Parts of Central London are the densest in the UK. Employment in London is highly concentrated compared to other cities. The City of London's square mile has around 250,000 employees, Canary Wharf around 600,000 employees per square mile.

Productivity
Major urban areas demonstrate higher per worker productivity. The greater the productivity per worker in an area, the greater the wider economic impact. Because different sectors have different productive elasticities, an improvement in transport in areas with greater employment in those sectors with higher elasticity values will generate more WIs. The productive elasticities of real estate, retailing, financial services and business services tend to be highest in most urban locations[22].

> London's GVA per head is 66 per cent above the UK average – £33,200 in 2007. Inner London had the largest GVA per head[23] – £52,857 in 2006, compared with the UK average of £18,945[24]. London's economy is driven by business services, with acknowledged expertise in fields such as management consultancy, financial services and the creative industries. London is home to a quarter of UK enterprises in financial services and a third of UK employee jobs in this sector[25]. Business services is by some distance the largest sector in London with 1.1 million employee jobs[26].

Labour market
Labour market impacts are driven by the potential for people to move into higher paid jobs. If there are more people living in an area – and more jobs in total – then the potential for this to occur is higher. These benefits will be greater in areas of high population density and high employment density.

> Over the last decade there have been more than 700,000 workers commuting into London every day[27]. Over 1 billion passengers used the Tube in 2007. Conservative estimates suggest that 1.5 billion journeys will be made per annum by 2020[28]. Two thirds of all rail journeys in the South East are currently to or from London[29], while Crossrail will bring a further 1.5 million new commuters within one hour's journey of the capital[30].

In short, higher base employment, a greater change in effective employment density, more concentrated activity in productive sectors, and higher productivity itself lead to greater economic benefits from transport investment.

CONCLUSION

While transport investment is vital to economic growth, the returns vary considerably from scheme to scheme. Given the state of public finances, it is unlikely that all schemes with a net positive value will proceed, let alone all those that are seen as socially desirable.

As Eddington states: “Where resources are limited and there is a need for prioritisation it is logical to begin with identifying cost-effective transport interventions in areas which are expected to yield the greatest contributions to sustainable economic performance in the UK.”

This report concludes that there should be a credible, transparent and consistently applied framework for prioritising transport projects, based on their long-term contribution to the wider economy.

ANNEX

Summary of schemes reviewed

Crossrail
Major new infrastructure, under construction. A new high frequency, railway for London and the South East, from Maidenhead and Heathrow in the west to Shenfield and Abbey Wood in the east via new twin tunnels under central London, due for delivery in 2017.

Airtrack
Proposed new infrastructure providing direct rail services connecting Heathrow directly to the South West Trains rail network (including Guildford, Reading and Waterloo), with delivery in 2016.

Piccadilly line
Planned major infrastructure renewal and upgrade of existing Tube line to improve reliability and increase capacity by 24 per cent, due for delivery by 2014/15.

Victoria line
Planned major infrastructure renewal and upgrade of existing Tube line to improve reliability and increase capacity by 21 per cent, due for delivery in 2012/3.

Sub-surface lines
Planned major infrastructure renewal and upgrade of existing Tube lines to improve reliability and increase capacity, incorporating the Circle line (65 per cent capacity increase), Hammersmith & City line (65 per cent capacity increase), District line (24 per cent capacity increase) and Metropolitan line (27 per cent capacity increase), due for delivery from 2013 (and fully complete by 2018).

Bakerloo line
Proposed major infrastructure renewal and upgrade of existing Tube line to improve reliability and increase capacity by 57 per cent, for delivery by 2020.

Leeds Urban Area Highway and Leeds to Bradford public transport
Proposed road infrastructure renewal and public transport improvements, incorporating widening of the M621,extra highway capacity, improvements to bus fares and frequency, and increased rail capacity between Leeds and Bradford.

M6 shoulder running
Planned upgrade of existing infrastructure, allowing hard shoulder running in peak periods, due for delivery in 2012.

High speed rail (HS2)
Proposed major new infrastructure, delivering a high-speed rail service between London and the West Midlands.

A46 interurban road
Upgrade of infrastructure, under construction, increasing capacity (through dualling) of 26km of road between Newark and Widmerpool in Nottinghamshire, due for delivery in 2012.

South Essex Rapid Transit
Planned improvement in public transport with a new bus network developed by Essex County Council, Southend-on-Sea Borough Council and Thurrock Council.

A11 Fiveways to Thetford
Planned renewal of infrastructure, increasing capacity (through dualling) of 14km of road between the Fiveways and Thetford West roundabouts, on a strategic route linking London, Cambridge and the East of England.

A120 Braintree to A12
Proposed renewal of infrastructure, increasing capacity with a new dual carriageway between Braintree and the A12 on a road corridor in the East of England connecting the Haven Gateway area to Stansted and the M1.

Deloitte and Peter Brett Associates were commissioned to carry out the study underpinning this report. If you would like to see their full analysis, please visit our website, www.londonfirst.co.uk

We welcome views on the data and analysis presented in the full report as we actively consult on our findings.

Please contact Rob Fox on rfox@londonfirst.co.uk or +44 (0)20 7665 1500.

[1] Going for Growth, OECD, 2009.

[2] The Department for Transport (DfT) calculates the impact of transport improvements in terms both of Direct (Welfare) Benefits and Wider Impacts – or wider economic benefits. Wider economic benefits are expressed in terms of increased GDP.

[3] Going for Growth, OECD, 2009.

[4] Economic Conditions Snapshot, February 2009: McKinsey Global Survey Results.

[5] Economic Survey of the United Kingdom, OECD, June 2009.

[6] The Eddington Transport Study, HM Treasury, Department for Transport, 2006.

[7] City Links: Integration and Isolation, Centre for Cities, 2008.

[8] Cf. The Eddington Transport Study, HM Treasury, Department for Transport, 2006.

[9] Primarily journey time and cost savings to users, as well as some externalities (on the environment, landscape, accessibility and heritage)

[10] Comparative analysis was limited to a choice of a small number of publicly available studies that provide an assessment of wider impacts (WIs).

[11] At various stages of delivery, from proposal to construction. See Annex for further detail on these schemes.

[12] In increased GDP. All costs and benefits quoted are Net Present Value, in 2002 prices (other than High Speed Rail at 2009 present value), over 30 or 60 years. Figures based on the information available at the time of the analysis.

[13] Appraisals are expected to match the scope and complexity of the scheme in question.

[14] Labour market impacts and output change in markets with imperfect competition.

[15] Transport Investment – The wider welfare benefits and the GDP effects of transport schemes, David Simmons Consultancy, 2006.

[16] Focus on London, GLA, 2009.

[17] http://www.london.gov.uk/thelondonplan/caz/central_activities.jsp

[18] The Economic Outlook for London, in Economic Outlook, pub. Wiley-Blackwell, April 2010.

[19] For one year – 2006.

[20] For example, analysis of Manchester includes the local authorities of Manchester, Trafford, Salford, Tameside, Stockport and Oldham.

[21] Of public capital to output.

[22] Investigating the link between productivity and agglomeration for UK industries, Department for Transport, 2005.

[23] On a workplace basis.

[24] Focus on London, GLA, 2009.

[25] Ibid.

[26] Ibid.

[27] Economic evidence base to support the London Plan, the Transport Strategy and the Economic Development Strategy, GLA Economics, May 2010.

[28] Holding the Line: The Economic Benefits of Modernising the Tube, London First, 2009.

[29] National Rail Trends 2008-2009 Year Book, Office of Rail Regulation, 2009.

[30] Crossrail Ltd.

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