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Transport expenditure in London

Mark Wingham

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For more information about this publication, please contact:

GLA Economics

Tel 020 7983 4922

Email glaeconomics@london.gov.uk

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Executive summary

In an attempt to boost economic growth by improving productivity and living standards, the UK Government published its [Industrial Strategy](#) in January 2017¹. One way that it hopes to achieve this is by investing in the UK's infrastructure, especially transport. Considering this, this paper sets out the rationale for investing in transport infrastructure and presents data on the current and planned levels of transport expenditure, with an emphasis on London.

Having a good transport system that is efficient and reliable is essential for supporting economic growth. It can reduce costs to both businesses and consumers by reducing travel times, alleviating congestion and enabling better access to markets. It can also promote agglomeration benefits whereby businesses and consumers benefit from being close to each other and enable a more efficient allocation of resources. In addition, it can help to stimulate private sector investment by increasing returns. These benefits are of particular relevance to London given that it has specialised in a number of internationally competitive sectors. These industries benefit from having access to a highly skilled labour force and both suppliers and customers, which is partly a result of having a good transport network.

Despite these arguments, congestion and overcrowding can potentially dampen these benefits and raise questions as to whether the transport infrastructure can support economic growth in the future. This is particularly true for London where, as illustrated by Chapter 6 of the [Economic Evidence Base for London](#)², faces acute capacity issues with its transport network. For example, there were around 31.5 million daily journey starts in London during 2015 – almost a quarter more than in 2000 – and means that overcrowding on trains and the number of hours idling in traffic in the capital is worse than other UK cities.

The latest estimates suggest that £8.5 billion was spent by the public sector on transport in London during 2015-16. Over two-thirds (70.4 per cent) of this was capital expenditure, which was the highest share among the UK regions. At face value, London would appear to receive the most transport expenditure in the UK (historically between 20 and 30 per cent of the UK total) and this is true even after accounting for population differences. However, these simple regional comparisons are not necessarily made on a like-for-like basis nor in a 'rationale' manner. For example:

- London is an entirely urban area, whereas other UK regions include a mix of urban and rural areas. This means that regional comparisons are not like-for-like as transport is likely to represent a larger proportion of public sector spending in an urban area. Consequently, a fairer comparison would be to look at transport expenditure for the Greater South East (GSE)³ which is more 'balanced' in terms of land use. Here, spend per head for the GSE was around half that for London on its own, though still above the UK average.
- Comparing regions based on how much transport expenditure they receive on its own or on a per head basis does not properly account for the need or demand for transport. Not only has transport use grown significantly in London over time as noted above, but the capital's transport network is also beneficial to the surrounding area particularly due to the high level of commuting. Therefore, this lends itself away from a 'per head' measure to one based on

¹ HM Government (2017). Building our industrial strategy: green paper, January 2017.

² GLA Economics (2016). Economic evidence base for London 2016.

³ This includes London, the South East and East of England.

the number of users. On this basis, **the amount spent on railways per passenger journey and the amount spent on roads per 1 million vehicle miles in London were one of the lowest among the GB regions**. In particular, London has seen the largest decline in road expenditure per 1 million vehicle miles since 2007-08.

- It is more 'rational' to compare transport expenditure with the size of an economy. That is because transport is essential in supporting an economy. It also brings it in line with how other economic indicators are compared, i.e. national debt and R&D investment is usually referred to in terms of a share of economic output. Consequently, transport spending in London as a share of economic output (as measured by GVA) was largely on par with Wales and Scotland; while for the Greater South East more generally, it was broadly in line with the UK average. Therefore, this suggests **expenditure in London and the surrounding area was proportionate to the size of the economy**.
- It is also worth considering public sector expenditure in terms of the amount of tax London generates. On this basis, transport expenditure in the capital as a share of tax revenue was above the UK average, but was generally in line with this when including the surrounding area. In addition, if considering all public sector spending in the capital, then **London raises more in tax than it receives** making it a net contributor to the Exchequer.
- So, overall, while initially London receives more than a quarter of the UK's expenditure on transport, it is reflective of the demand and need for transport in the capital. That is, London has one of the lowest amounts of railway expenditure and road spending per 'user' in Great Britain; total spending is in proportion to the size of the economy; and London receives less in public expenditure as a whole than what it contributes in tax.

It should also be noted that public sector expenditure on transport is increasingly being funded directly by London taxpayers. For example, more than half of the cost of Crossrail 1 is funded directly by London businesses and Londoners. This includes the Crossrail business rate supplement which is an additional tax on London businesses only and, being a new tax, does not 'subtract' funds from other transport projects. Similarly, the Northern Line Extension is being financed by future growth in business rates paid by London firms, as well as developer contributions. More generally, almost half of Transport for London's (TfL's) budget comes from fare revenue (i.e. the users of London's transport network) alone. However, the fact that **London is directly contributing to the cost of its transport projects** is not shown in the public sector expenditure data used above. It is instead focussed on who is responsible for the spending (with TfL categorised as being local government for instance) rather than how it was funded. Thus, a simple comparison of this transport expenditure data may give a misleading view of the national contribution to London's transport infrastructure, of which significant sums are financed by taxes set in London specifically for this purpose.

Importantly, **the share of transport expenditure borne locally is likely to increase in the future** as and when more fiscal powers are devolved to London. Already, since April 2017, the GLA is now responsible for the TfL investment grant in return for a higher proportion of locally raised business rates income.

Investing in London's transport network should not be seen as being at the expense of other parts of the UK. On the contrary, with the [Growing Together II](#)⁴ report by GLA Economics

⁴ GLA Economics (2014). Growing together II: London and the UK economy.

suggesting that **London's growth is beneficial to the rest of the UK**. This can be in the form of investment creating demand for goods and services along the supply chain, such as the construction of new buses in Falkirk and Overground trains in Derby. TfL estimates that around 60 per cent of its spending through the supply chain occurs outside of London and helps support 50,000 jobs. As noted previously, transport investment can also be considered as ensuring London remains internationally competitive; if this was not the case, it could lead to a loss of business to the UK as a whole – not just London. The capital also contributes significantly more to the UK's public finances than it receives. Consequently, investing in London's transport system should not be seen as a 'zero-sum game' as essentially when London grows, the rest of the UK grows.

1 Introduction

The UK Government published its [Industrial Strategy Green Paper](#) in January 2017⁵. Its objective is to improve living standards and economic growth by boosting productivity of the UK and its regions. One of the areas that the Government has identified in achieving this objective is by upgrading the UK's infrastructure. This includes improving digital, energy, transport, water and flood defence infrastructure, as well as better aligning central government investment with local growth priorities.

In light of this, this paper sets out the rationale for investing in infrastructure and the current levels of investment in London, specifically in reference to transport. Research by other organisations previously looked at regional transport investment to some extent – for example, Centre for Cities' [Mapping Britain's public finances](#)⁶ and IPPR North's [Paying for our progress](#)⁷. However, they do not necessarily discuss transport investment in its entirety, but rather certain aspects of the investment picture. Subsequently, this paper takes a more holistic approach to transport expenditure.

This paper continues by first setting out the rationale for transport investment in that it can produce strong economic benefit. The following chapters then set out the current levels of investment in London's transport system and outlines how this expenditure is beneficial to both London and the UK as a whole. The final chapter summarises the main findings of this paper.

⁵ HM Government (2017). Building our industrial strategy: green paper, January 2017.

⁶ McGough, L & Swinney, P (2015). Mapping Britain's public finances, Centre for Cities, 6 July 2015.

⁷ Blakeley, G (2017). Paying for our progress: how will the Northern Powerhouse be financed and funded, Institute for Public Policy Research North, February 2017.

2 Rationale for transport investment

Having a good transport system that is efficient and reliable is essential in supporting the economy. As such, there are generally three arguments outlined in the literature for investing in transport⁸.

The first relates to the argument that inadequate infrastructure can constrain economic growth by raising costs to businesses and consumers through increased congestion and longer travel times. Consequently, the 'ameliorative' argument suggests that investment should be made in places where the economy and demand for transport is growing to alleviate congestion. However, this argument is sometimes disputed in that resources are targeted at areas which are already growing and potentially lead to higher environmental costs.

Another argument is focussed on agglomeration benefits which are the positive externalities which arise when specialised economic activity takes place in a spatial concentration, such as in central London. In that case, better infrastructure can reduce transport costs (i.e. shorter travel times and reduced fares) which in turn enable a more efficient allocation of resources and boost productivity. Several studies have attempted to measure these agglomeration benefits, with research conducted for the Department for Transport reporting that these productivity effects are positive and important⁹.

Also, it is argued that an efficient transport network can also help to facilitate firms' access to markets and lower their transaction costs further leading to efficiency gains. This can be in the form of becoming increasingly specialised (which could have wider spill-over effects) and economies of scale. In addition, the What Works Centre for Local Economic Growth also suggests it can increase private sector returns which could stimulate private sector investment¹⁰.

These arguments for transport investment – particularly in cities like London – are further outlined in a report by Volterra¹¹. In addition, they argue that there needs to be a new way of allocating transport investment that takes a more holistic view of the needs and benefits of such expenditure.

The benefits discussed above are of particular relevance to London given that the capital's economy is specialised in a number of internationally competitive business areas. This includes financial and insurance activities and professional services that have tended to locate in certain areas of London (primarily central London) which have spurred some of the agglomeration benefits discussed above. These sectors rely on having access to a highly skilled labour force and complementary markets (in terms of both buying (inputs) and selling (outputs) goods and services) which, to some extent, relies on having a good transport system. For example, Map 1

⁸ For example, see:

Gibbons, S. (2015). Planes, trains and automobiles: the economic impact of transport infrastructure, SERC Policy Paper 13; Mel, P & Graham, D & Brage-Ardao, R (2013). The productivity of transport infrastructure investment: a meta-analysis of empirical evidence, *Regional Science and Urban Economics*, 43, 5, pg. 695-706; and Graham, D (2007). Agglomeration, productivity and transport investment, *Journal of Transport Economics and Policy*, 41, 3, pg. 317-343.

⁹ Vernales, A & Laird, J & Overman, H (2014). Transport investment and economic performance: implications for project appraisal, October 2014.

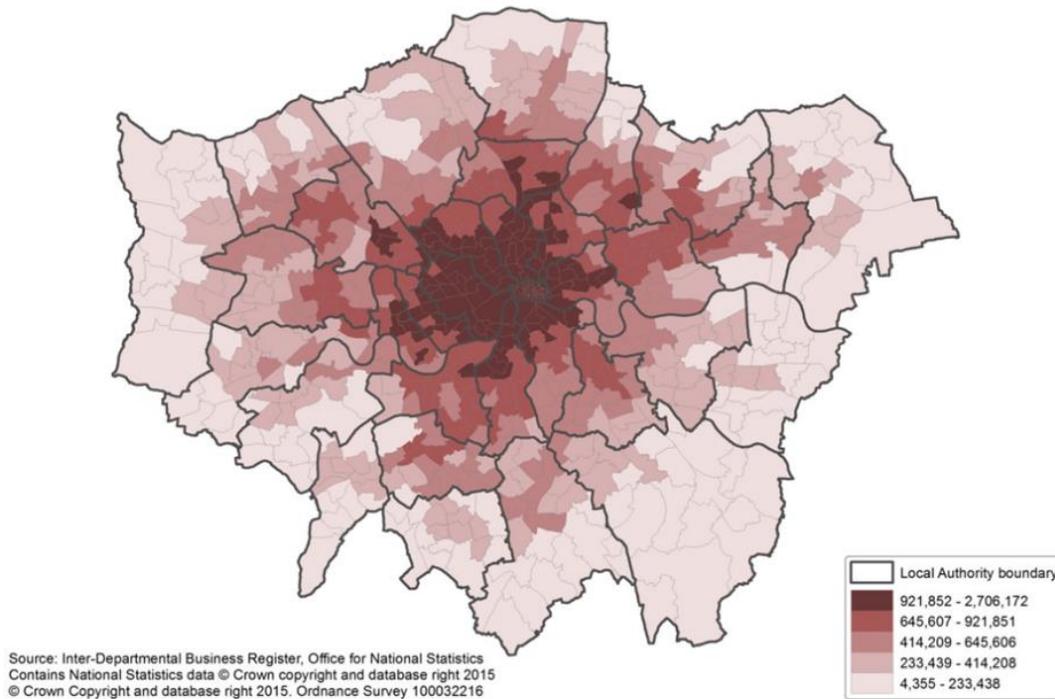
¹⁰ What Works Centre for Local Economic Growth (2015). Transport: evidence review 7, July 2015.

¹¹ Volterra (2014). Investing in city regions: the case for long-term investment in transport, November 2014.

shows the large number of people who are within a 45-minute travel time by public transport of central London.

Map1: Population accessibility by public transport within 45 generalised minutes by ward in London

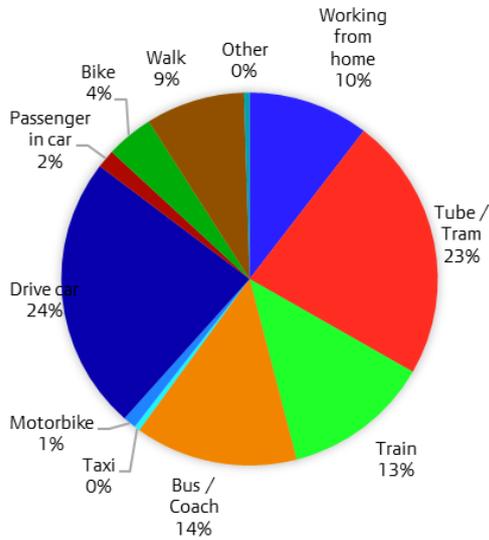
Population accessibility by public transport within 45 generalised minutes, by ward in London



Source: GLA Intelligence Unit

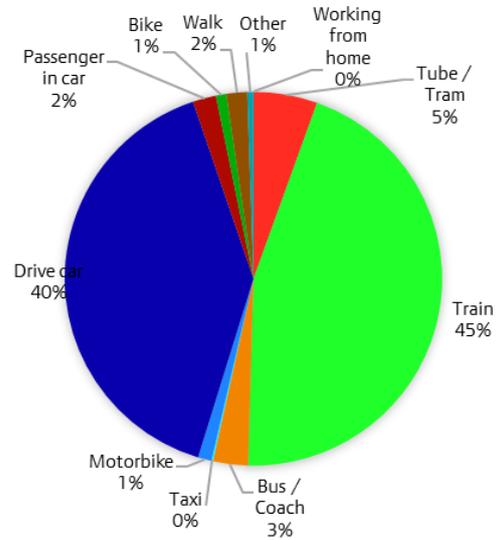
London's core employment centre is critically dependent on London's transport system. For example, Figure 1 shows that around a half of people working and living in London commute to their job via public transport. Figure 2 looks at people working in London though commuting from the wider South East and similarly shows the importance of trains as well as cars. Overall, over 50 per cent of all commuter journeys in London (whether they live in the capital or not) were by public transport in 2011.

Figure 1: Method of travel to work for workers in London from London in 2011



Source: ONS Census 2011, GLA Intelligence Unit

Figure 2: Method of travel to work for workers in London from the wider South East in 2011



Source: ONS Census 2011, GLA Intelligence Unit

Thus, London's transport system has seen significant growth over time¹². For example, Table 1 shows the number of daily trips by mode of transport in London and illustrates the strong growth in bus, rail and Tube usage. In total, there were 31.5 million daily journey stages in 2015, up 0.8 per cent from 2014 and 24.4 per cent from 2000.

¹² More information about the trends in London's transport network is contained in Chapter 3 of the Economic Evidence Base for London 2016.

Table 1: Estimated daily average number of trips by main mode of travel in Greater London between 1995 to 2015, seven-day week, millions

Year	Rail	Underground	DLR	Bus/tram	Taxi/PHV	Car driver	Car passenger	Motor cycle	Cycle	Walk	Total
1995	1.5	2.1	0.0	3.3	0.3	6.8	3.7	0.2	0.3	5.2	23.4
1996	1.5	2.1	0.0	3.4	0.3	6.9	3.8	0.2	0.3	5.3	23.7
1997	1.6	2.2	0.1	3.5	0.3	6.9	3.8	0.2	0.3	5.3	24.1
1998	1.7	2.4	0.1	3.5	0.4	6.9	3.8	0.2	0.3	5.3	24.4
1999	1.8	2.5	0.1	3.5	0.4	7.1	3.8	0.2	0.3	5.4	25.0
2000	1.8	2.6	0.1	3.7	0.4	7.0	3.8	0.2	0.3	5.5	25.3
2001	1.8	2.6	0.1	3.9	0.4	6.9	3.7	0.2	0.3	5.5	25.6
2002	1.9	2.6	0.1	4.2	0.4	6.9	3.7	0.2	0.3	5.6	25.9
2003	1.9	2.6	0.1	4.6	0.4	6.8	3.6	0.2	0.4	5.6	26.2
2004	2.0	2.7	0.1	5.0	0.4	6.7	3.6	0.2	0.4	5.6	26.6
2005	2.0	2.6	0.1	5.0	0.4	6.6	3.6	0.2	0.4	5.7	26.7
2006	2.1	2.7	0.2	5.2	0.4	6.6	3.7	0.2	0.5	5.7	27.2
2007	2.3	2.9	0.2	5.9	0.4	6.4	3.7	0.2	0.5	5.8	28.3
2008	2.4	3.0	0.2	6.2	0.4	6.3	3.7	0.2	0.5	5.9	28.7
2009	2.3	2.9	0.2	6.3	0.4	6.3	3.7	0.2	0.5	6.0	28.9
2010	2.5	3.0	0.2	6.3	0.3	6.3	3.7	0.2	0.5	6.1	29.2
2011	2.7	3.2	0.2	6.4	0.4	6.1	3.8	0.2	0.6	6.2	29.7
2012	2.9	3.3	0.3	6.4	0.4	6.0	3.8	0.2	0.6	6.3	30.2
2013	3.1	3.4	0.3	6.5	0.4	6.0	3.8	0.2	0.6	6.3	30.6
2014	3.2	3.5	0.3	6.7	0.4	6.1	3.9	0.2	0.6	6.4	31.3
2015	3.3	3.7	0.3	6.5	0.3	6.0	3.9	0.2	0.7	6.5	31.5

Source: Transport for London (2016). [Travel in London 9](#).

Despite these arguments, London’s transport network is at times overcrowded and congested as illustrated in Chapter 6 of the [Economic Evidence Base for London 2016](#)¹³. For example:

- London commuter zone drivers wasted an average of 96 hours in traffic during 2014, above the UK average of 30 hours. In particular, Londoners spent more time idling in traffic than their European city counterparts.
- The number of passengers using public transport in London at peak hours far exceeds that of other major cities in England and Wales. For example, London Bridge station has nearly double the number of passenger arrivals on any given day than all the stations in Birmingham combined. This means that comparisons between London and other UK cities are not necessarily on a like-for-like basis.
- Using the Passengers in Excess Capacity (PiXC) measure, the Department for Transport reported that rail peak overcrowding on a typical autumn weekday in 2014 was worse in London (4.1 per cent PiXC) compared with ten other UK cities (1.4 per cent PiXC). Consequently, overcrowding on the rail network is a particular issue facing the capital.
- London has limited airport capacity – Heathrow is already operating at full capacity, while Gatwick is operating at 85 per cent capacity and full capacity during peak periods.

While some level of congestion is the inevitable consequence of having to transport a large number of people, it could be the case that current levels are sub-optimal. For example, excessive congestion can make an area less attractive to both businesses and people limiting the

¹³ GLA Economics (2017). Economic evidence base for London 2016.

agglomeration benefits discussed above. It could also raise the cost of locating in certain areas (i.e. higher rents and increased wages to attract staff) which could affect the competitiveness of firms. Given that London is a global city (thus it competes with other global cities rather than other cities across the UK), this could consequently have a knock-on effect on the capital's international competitiveness. This would be a detriment to the UK as a whole and not just London. There is also a question as to whether the transport infrastructure can keep up with rising demand as London's economy grows.

3 Investing in London's transport network

While the previous chapter set out the arguments for investing in transport infrastructure, this chapter discusses the current levels of transport investment in London.

Current levels of investment

The public sector spent approximately £28.1 billion on transport across the UK during the 2015-16 financial year. That is according to the Public Expenditure Statistical Analyses (PESA) data collected by HM Treasury which is one of the most comprehensive datasets showing public sector investments and expenditure (see Box 1)¹⁴. That was around 3.7 per cent of total government spending (also known as the total managed expenditure). To put that into perspective, the amount spent on transport was broadly comparable to that spent on public order and safety (£30.2 billion), yet around one-fifth of that for health (£138.7 billion) and one-tenth of that for social protection (£264.2 billion).

Box 1: Public Expenditure Statistical Analyses (PESA) data

One of the main sources to identify trends in public sector spending is the PESA data compiled by HM Treasury. This includes information on central government departmental budgets, as well as the expenditure on services by the whole of the public sector using National Accounts definitions. The latter is used in this paper as it provides a more comprehensive view of public expenditure.

The PESA data can also be broken down by UK region as part of the Country and Regional Analysis (CRA)¹⁵. It can further be broken down into which levels of government were ultimately responsible for the spending – that is, whether it was by central government, local government (including bodies such as Transport for London (TfL)) or public corporations. As will become apparent later in this chapter, this becomes an issue in that it does not consider how the spending was funded.

It further provides information as to whether the spending represented capital or current expenditure. In addition, it also includes information as to which spending area the expenditure was made. These spending areas are based on the UN Classification of the Functions of Government (COFOG) definitions and include:

- General public services
- Defence
- Public order and safety
- Economic affairs
- Environment protection
- Housing and community amenities
- Health
- Recreation, culture and religion
- Education
- Social protection

¹⁴ <https://www.gov.uk/government/collections/public-expenditure-statistical-analyses-pesa>

¹⁵ <https://www.gov.uk/government/collections/country-and-regional-analysis>

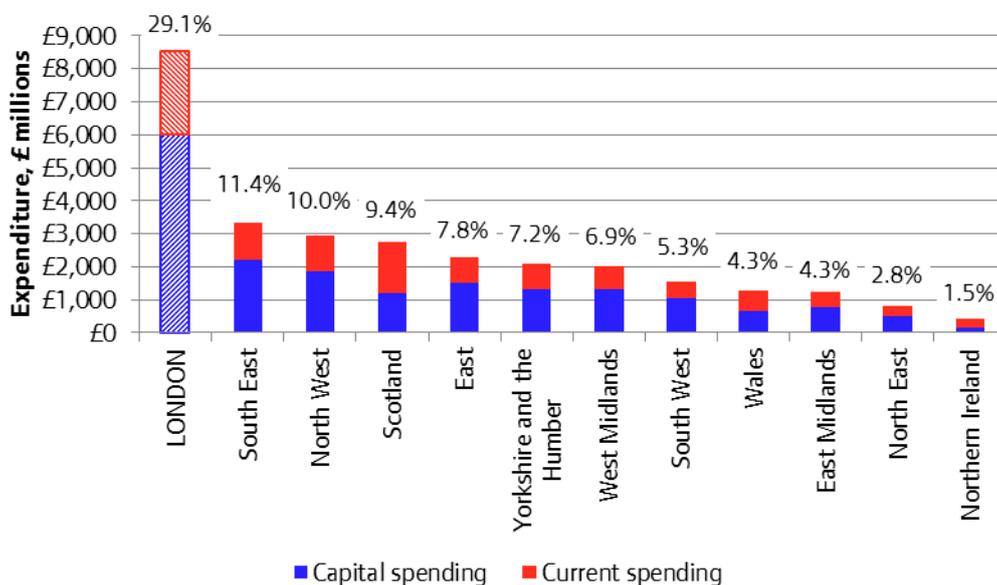
Within the economic affairs division, there is a specific group relating to transport which itself includes five sub-functions (see below). These definitions are used to identify transport investment in this paper.

- Local public transport
- Local roads
- National roads
- Railways
- Other transport

It is possible to attribute transport expenditure to specific regions of the UK. However, while some expenditure might occur outside of the UK or cannot be attributed to a specific region (i.e. UK wide projects), these have been allocated at a regional level on a per capita basis in this analysis. That said, it should be noted that this 'non-attributable' expenditure has historically represented less than 2 per cent of all transport spending in the UK.

Acknowledging the above, approximately £8.5 billion was spent on transport in London during 2015-16. This suggests that approximately 29.1 per cent of all transport spending in the UK was made in London¹⁶. As can be seen from Figure 3, that was more than the North East, North West and Yorkshire and the Humber combined.

Figure 3: Public sector expenditure on transport by UK region in 2015-16



Source: HM Treasury PESA

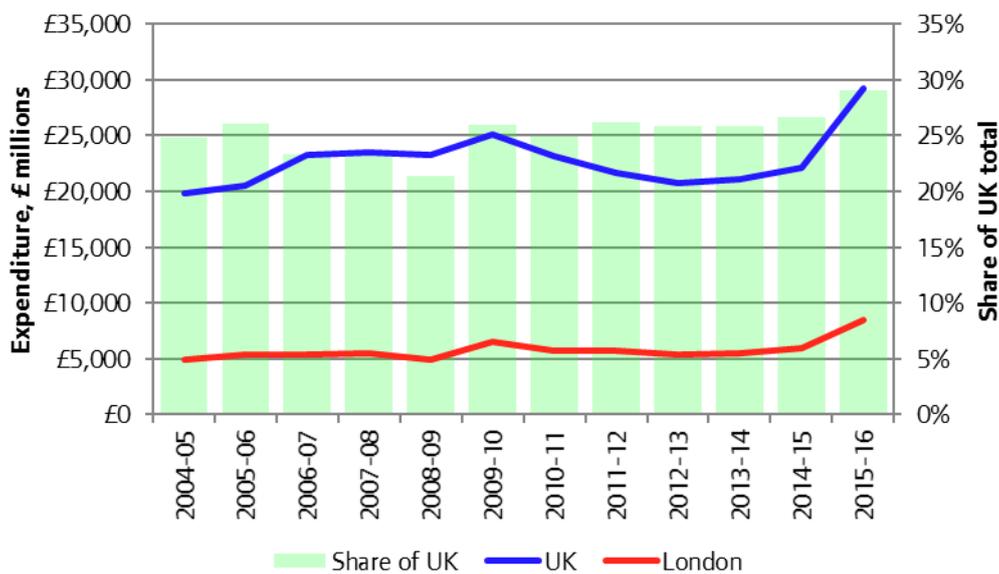
Over two-thirds (70.4 per cent) of transport expenditure in London was on capital projects, with the remainder current spending such as operating costs. London spends proportionally more on capital than other UK regions, with around 63.5 per cent of transport spending across the UK being capital expenditure (capex). Consequently, while 32.3 per cent of all the UK capital

¹⁶ The UK estimates used here (and subsequently) is the total public sector expenditure on services. This is different to the total managed expenditure as it does not include accounting adjustments which cannot be attributed to a specific service area.

expenditure on transport was in London, it was lower, at 23.6 per cent, for operating expenditure (opex).

Historic data is available back to 2004-05. Though, when looking at prices over time, it is better to remove the effects of inflation to show the underlying trend. That is, some of the increase in expenditure could be reflective of higher prices rather than a genuine increase in spending. The GDP deflators published by HM Treasury are used here to present transport expenditure in constant 2015-16 prices. Given this, Figure 4 shows that London’s share of total transport expenditure for the UK has in recent history been between 20 and 30 per cent.

Figure 4: Public sector expenditure on transport in London and the UK over time, constant 2015-16 prices, £ millions

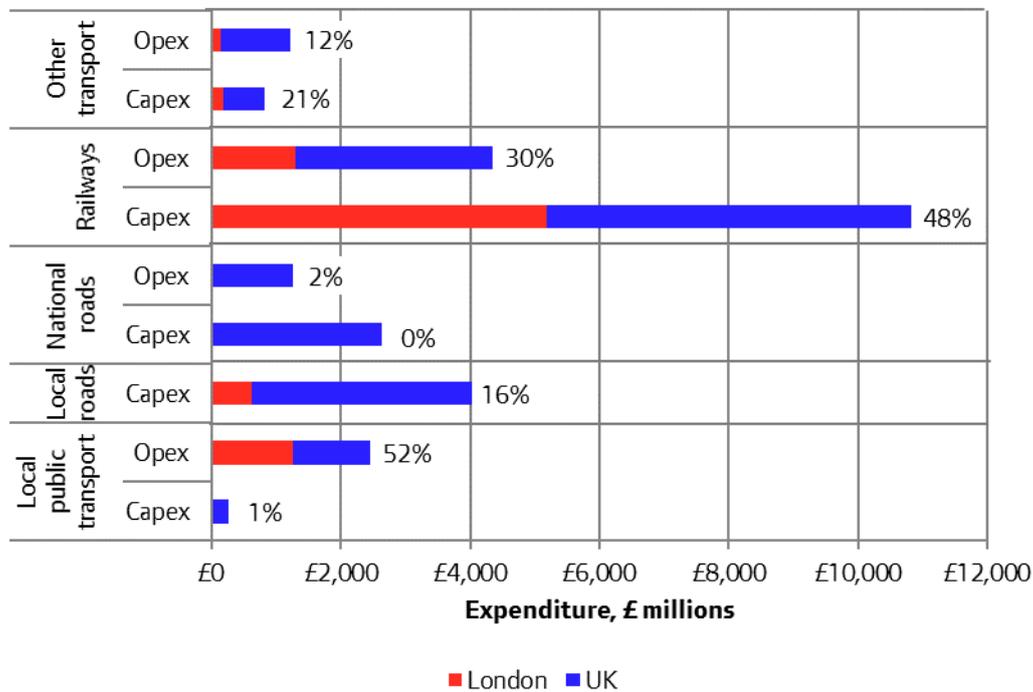


Source: HM Treasury PESA

Transport expenditure can be analysed at a more detailed level. Acknowledging this, around three-quarters (76.3 per cent) of transport spending in London was on railways in 2015-16, of which around four-fifths (79.8 per cent) was capex. A further 14.9 per cent was spent on local public transport (which was almost entirely opex), while 4.8 per cent and 0.3 per cent was spent on local and national roads respectively. The remaining amount (3.8 per cent) was spent on ‘other’ transport.

As a percentage of total expenditure for the UK, approximately two-fifths of all UK spending on local public transport (46.7 per cent) and railways (42.8 per cent) was in London in 2015-16. In contrast, relatively speaking, little is spent on local and national roads in London.

Figure 5: Public sector expenditure on transport in London and the UK by sub-function in 2015-16, £ millions



Note: London's share of the UK total is shown next to the bars. Source: HM Treasury PESA

While on initial inspection it could appear that proportionally more is spent on transport in London than elsewhere (see above), simply looking at the total amount of expenditure does not consider need or demand for transport. Traditionally, this is often assessed by looking at measures of spend per resident, though a better measure is spend per daytime population which takes into account commuters and tourists who do not necessarily live in that specific area. Better still is looking at the actual number of transport users, such as the number of rail passenger journeys, to illustrate actual demand. Moreover, given that transport infrastructure is essential in supporting an economy (see Chapter 2); a more 'rational' way of looking at transport investment is in terms of the region's economic contribution. For example, in terms of the amount of tax the region generates and the amount of economic output the infrastructure supports. Consequently, these different ways of looking at transport expenditure are looked at in turn below.

Expenditure per head

This section looks at the amount of transport expenditure per person for each UK region. Initially, there are two measures of people that can be used in this analysis. The first relates to the resident population – that is, the number of people actually living within that region. The second is the usual daytime population which can consist of residents, but also net commuters and tourists. While commuters and tourists are not formally part of population estimates, they do 'use' transport infrastructure and so it could be more accurate to include them in expenditure per head calculations. Both measures are looked at in this section.

Box 2: Usual resident and daytime populations

The usual resident population shows the number of people living in a particular region on any given day. The ONS produces estimates of the usual resident population by UK region and is primarily based on Census data¹⁷.

The daytime population in this paper refers to the number of people who are in a particular region on any given day regardless of whether they live in that region. The definition of the daytime population used here is the number in employment by place of work, number not in work by place of residence, number of school children by place of education, the number of infants by place of residence and the number of international and domestic visitors by place of visit. This is consistent with previous attempts to estimate the daytime population by the GLA Intelligence Unit¹⁸. It also uses several sources of data including ONS Business Register and Employment Survey, ONS Annual Population Survey, Department for Education School Census, ONS International Passenger Survey, Visit Britain GB Tourism Surveys and GLA population projections. However, it should be noted that information in these datasets is not consistently available over time or for Wales, Scotland and Northern Ireland. Consequently, estimates of the daytime population are only available for the English regions and only refer to 2015.

Overall, the estimates of the usual resident and daytime populations by region are shown in Table 2.

Table 2: Usual resident and daytime populations by region in 2015, millions

	North East	North West	Yorkshire & The Humber	Midlands East	Midlands West	East of England	London	South East	South West
Usual resident population	2.625	7.174	5.391	4.677	5.751	6.076	8.674	8.948	5.471
Usual daytime population	2.959	8.288	6.232	5.257	8.043	6.756	11.358	10.293	6.606
Of which:									
In work	1.262	3.719	2.848	2.409	2.929	3.144	5.758	4.902	3.150
Not in work	0.954	2.437	1.777	1.519	3.419	1.842	2.441	2.687	1.738
Infants	0.150	0.440	0.331	0.277	0.364	0.376	0.634	0.546	0.307
Students	0.391	1.100	0.836	0.702	0.914	0.939	1.378	1.362	0.774
Visitors	0.202	0.591	0.441	0.350	0.417	0.454	1.147	0.796	0.637

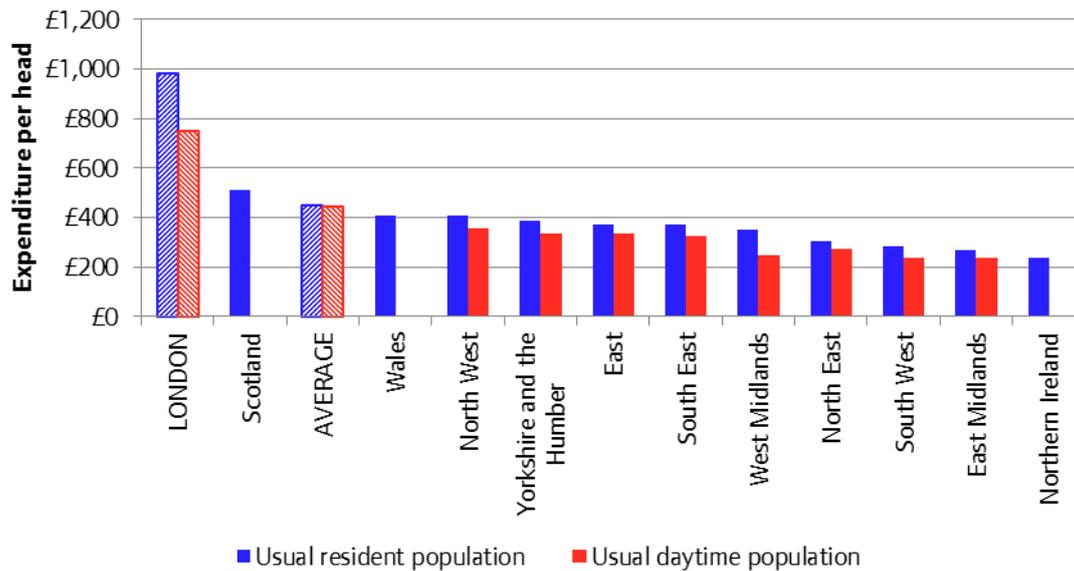
Source: ONS Population Estimates, ONS Census 2011, ONS International Passenger Survey, Visit Britain GB Tourism Survey, Visit Britain GB Day Visits Survey

Given this, using the estimates of the usual resident population, the amount of transport expenditure per person living in London was approximately £981 in 2015-16 (Figure 6). That was more than double the UK average of £449 and the highest for any UK region. However, when looking at the usual daytime population, transport spending per person in London was lower at £749 reflecting net in-commuting and a high number of visitors to London (though it was still above the England average of £444).

¹⁷ ONS MYEDE Population estimates for high level areas (via Data Explorer)

¹⁸ <https://data.london.gov.uk/dataset/daytime-population-borough>

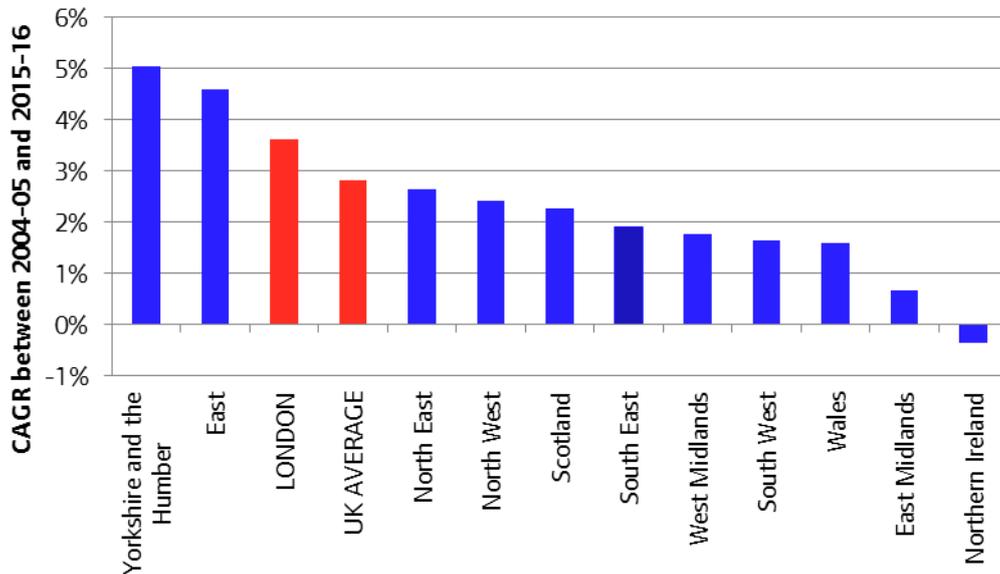
Figure 6: Public sector expenditure on transport per head for the usual resident and daytime populations by UK region in 2015-16



Note: Average refers to the UK for residents and England for daytime populations. Source: HM Treasury PESA, ONS Population Estimates, GLA Economics calculations

It is possible to look at transport expenditure per head over time, but only for the usual resident population. On this basis, most UK regions – including London – have seen an increase in transport expenditure per resident since 2004-05 in real terms (i.e. after accounting for inflation). For example, spend per head in London has risen from £662 in 2004-05 to £981 in 2015-16 in constant prices. This can more clearly be seen in Figure 7 that shows the compound average rate of growth (CAGR) in real prices for the UK regions. For London, spend per head has increased by 3.6 per cent per annum on average. That was more than the UK average of 2.8 per cent, but less than that for Yorkshire and the Humber (5 per cent) and East of England (4.6 per cent).

Figure 7: CAGR in public sector expenditure on transport per head (resident population) between 2004-05 and 2015-16 by UK region in constant prices



Source: HM Treasury PESA, ONS Population estimates

Similarly, it is possible to look at trends by the sub-functional spending categories over time. Overall, Table 3 shows that London has seen a reduction in the spend per head for the local public transport, local roads and national roads sub-functions between 2007-08 and 2015-16. In particular, it saw one of the strongest declines for road expenditure among the UK regions.

Table 3: Public sector expenditure on transport per head (resident population) by sub-function and UK region in 2007-08 and 2015-16, constant 2015-16 prices

Region	Local public transport		Local roads		National roads		Railways		Other transport	
	2007-08	2015-16	2007-08	2015-16	2007-08	2015-16	2007-08	2015-16	2007-08	2015-16
North East	£42	£26	£88	£92	£52	£59	£70	£18	£14	£18
North West	£53	£42	£80	£89	£64	£46	£127	£204	£13	£28
Yorkshire and the Humber	£37	£21	£82	£82	£35	£84	£102	£182	£11	£20
East Midlands	£31	£24	£93	£70	£81	£59	£71	£93	£11	£22
West Midlands	£36	£19	£92	£80	£72	£65	£93	£145	£13	£40
East	£39	£15	£108	£96	£68	£50	£58	£192	£11	£20
London	£192	£146	£96	£47	£6	£3	£401	£748	£17	£37
South East	£31	£16	£68	£72	£64	£79	£148	£182	£11	£24
South West	£23	£28	£82	£97	£93	£44	£61	£96	£17	£21
Scotland	£54	£50	£138	£129	£101	£132	£258	£117	£81	£83
Wales	£43	£14	£125	£67	£73	£95	£104	£209	£16	£24
Northern Ireland	£65	£23	£187	£133	£16	£10	£25	£46	£63	£27
UK average	£59	£42	£96	£83	£61	£60	£148	£233	£20	£31

Source: HM Treasury PESA, ONS Population estimates

Box 3: Transport expenditure in the Greater South East

Chapter 3 of the [Economic Evidence Base for London](#) highlighted the large flows of commuters into the capital, principally from the Greater South East (GSE)¹⁹. In fact, London accounted for over 40 per cent of an area's total employment in some parts of the GSE. As such, transport expenditure in London is not only beneficial to the capital itself, but also to the surrounding areas through these commuting flows. Consequently, transport spending may be better considered as part of the wider functional urban region, i.e. the GSE. Looking at expenditure for the wider GSE region would also make it more comparable with other UK regions. That is, London on its own is predominantly an urban area (in contrast with other regions that typically have a mix of urban and rural areas) which, as a result, means that transport is likely to constitute a larger proportion of spending²⁰. The GSE is more 'balanced' in this aspect enabling better comparisons.

Given the above, the total amount spent on transport by the public sector in the GSE was £14.1 billion in 2015-16. That was the equivalent of 48.3 per cent of the UK total. On a per head basis using the resident population, approximately £595 was spent on transport per person in the GSE. While that was above the UK average of £449, it was around half that for London on its own (£981). Additionally, on a daytime population basis, the amount of public sector expenditure on transport in the GSE was £497 per person. That was slightly higher than the England average of £444 (as no data exists for Scotland, Wales and Northern Ireland) and suggests that London and the surrounding area do not necessarily receive more than other regions.

Expenditure per user

Another way to describe the level of transport expenditure in London is in terms of the number of 'users'. This illustrates the actual demand for transport in the region. For instance, this can include the number of passengers using the railway or local public transport system or the number of vehicles using the road network. However, any analysis based on the number of users will be limited to areas where there is comparable data for all UK regions.

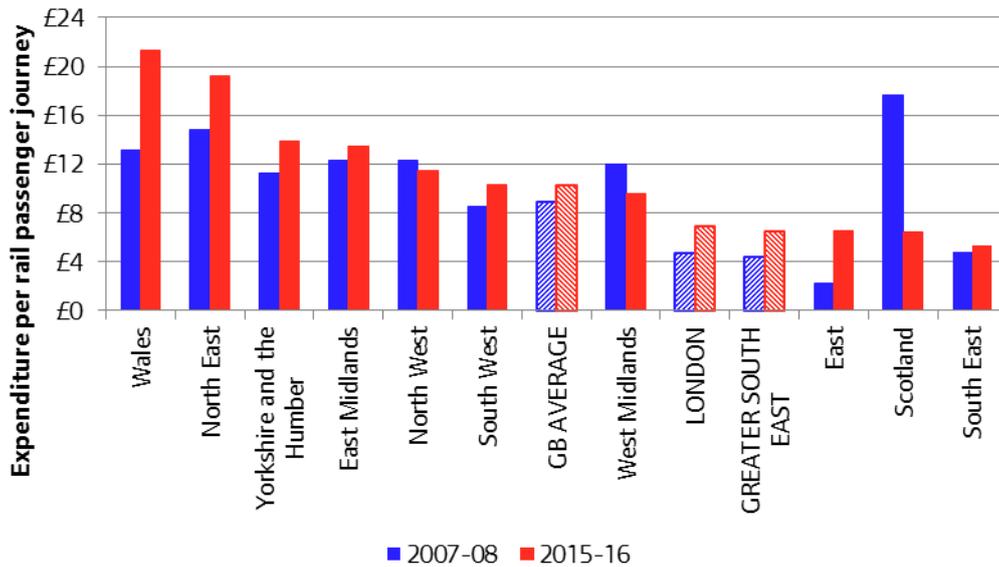
The Office for Rail and Road publishes data on the number of railway journeys by region for Great Britain which could be an indication as to the number of 'users'²¹. These showed that there were approximately 1.5 billion journeys across Great Britain in 2015-16, of which almost two-thirds (63.8 per cent or 934.6 million journeys) were in London. Comparing these estimates with public sector expenditure on railways, the amount spent per passenger journey in London was approximately £6.94 in 2015-16. That was below the GB average of £10.31 and, in fact, was one of the lowest among all the regions (Figure 8).

¹⁹ Ibid.

²⁰ A similar argument was made in Travers, T et al (2010). Public spending priorities in London, May 2010.

²¹ Office for Rail and Road Regional rail usage statistics

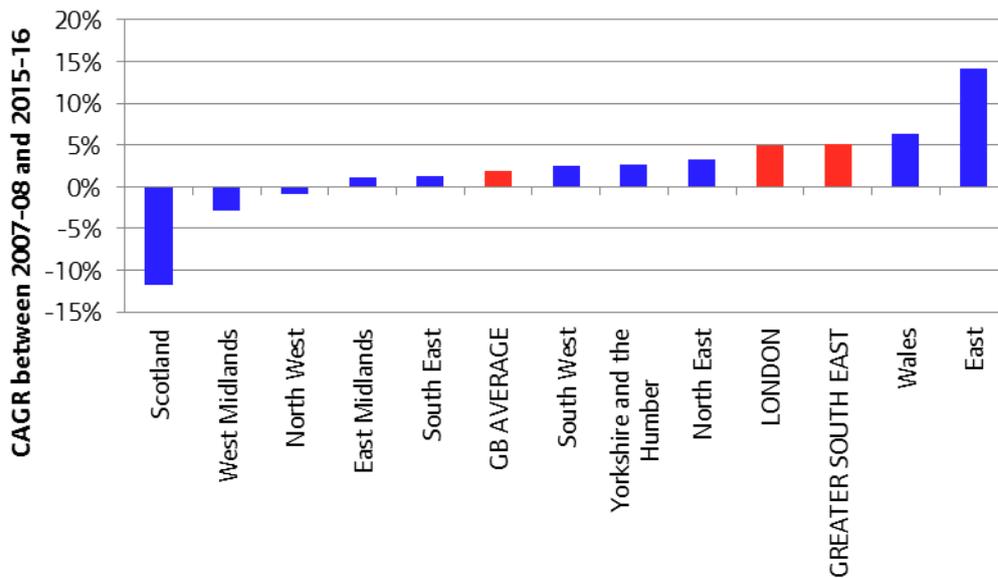
Figure 8: Public sector expenditure on railways per passenger journey by UK region in 2007-08 and 2015-16, constant 2015-16 prices



Source: HM Treasury PESA, Office for Rail and Road Regional Statistics

Most regions have seen an increase in the amount of railway expenditure per passenger journey in real terms between 2007-08 and 2015-16. The only exceptions were Scotland, West Midlands and North West. For London, railway expenditure per passenger journey increased 4.9 per cent per annum on average which was faster than the GB average of 1.9 per cent, though slower than the East of England (14.1 per cent) and Wales (6.3 per cent) (Figure 9).

Figure 9: CAGR in public sector expenditure on railways per passenger journey between 2007-08 and 2015-16 by UK region in constant prices

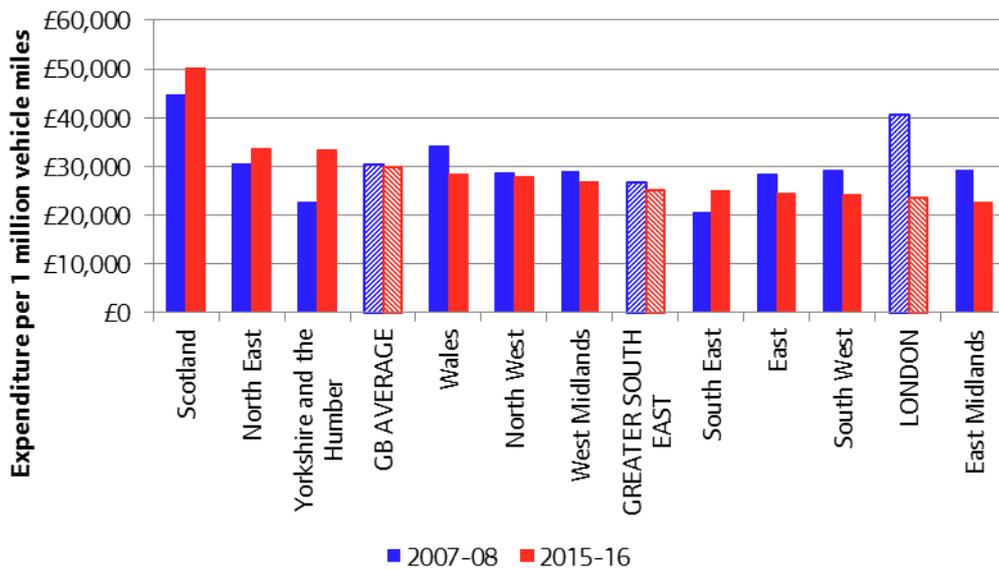


Source: HM Treasury PESA, Office for Rail and Road Regional Statistics

Similar estimates can be calculated for road use with the Department for Transport regularly publishing information on road traffic²². As part of this, they provide estimates of the number of vehicle miles or traffic volumes for most UK regions except Northern Ireland. The latest estimates suggest that there were 316.7 billion vehicle miles across Great Britain in 2015, of which 18.2 billion (or 5.7 per cent) were made in London. Overall, these estimates of vehicle miles could be a proxy of the road network's 'use'.

As the road traffic estimates include both major and minor roads, it is necessary to compare this with the PESA transport sub-functions that relate to both national and local roads. On this basis, the amount of public sector expenditure spent on roads in London was approximately £23,700 per 1 million of vehicle miles in 2015-16. That was the second-lowest among the GB regions (thus below the GB average of £29,400) and, consequently, does not suggest that more is spent in London (Figure 10).

Figure 10: Public sector expenditure on roads per 1 million vehicle miles by UK region in 2007-08 and 2015-16, constant 2015-16 prices

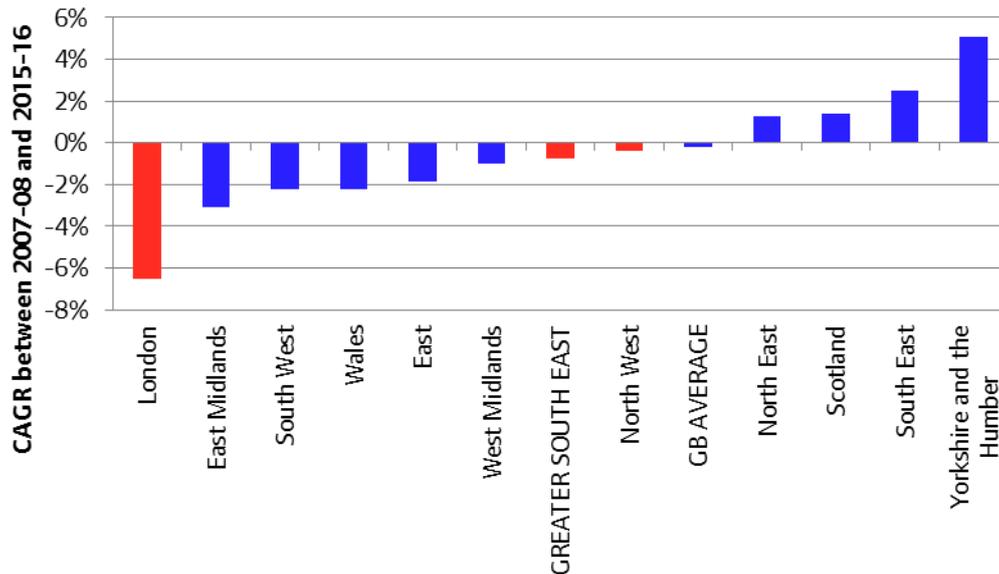


Source: HM Treasury PESA, Department for Transport Road Traffic Statistics

Moreover, when looking at trends over time, road transport expenditure in London fell on average at an annual rate of 6.5 per cent between 2007-08 and 2015-16 in real terms. That was the fastest rate of decline in Great Britain. Therefore, London not only has one of the lowest spends per vehicle mile in Great Britain; this has been falling at the fastest rate.

²² Department for Transport Road network and traffic statistics

Figure 11: CAGR in public sector expenditure on roads per 1 million vehicle miles between 2007-08 and 2015-16 by UK region in constant prices



Source: HM Treasury PESA, Department for Transport Road Traffic Statistics

Expenditure as a share of economic activity

Given that a good transport system is essential in supporting the economy, a more ‘rational’ way of looking at transport expenditure is in terms of economic activity supported rather than on a per head basis. Chapter 2 outlined how good infrastructure can give rise to agglomeration benefits by reducing transport costs which in turn enables a more efficient allocation of resources and boost productivity, thus supporting the local economy. Or to put it another way, an economy needs good transport to function and grow. This is particularly true for London where a lot of the economic activity, especially in the centre, is dependent on this infrastructure. Therefore, it makes sense to compare transport infrastructure with economic activity to illustrate the need for such expenditure. This would also then make it more in line with how such economic indicators are usually referenced. For example, national debt and R&D investment is usually referred to in terms of the size of an economy rather than on a per head basis.

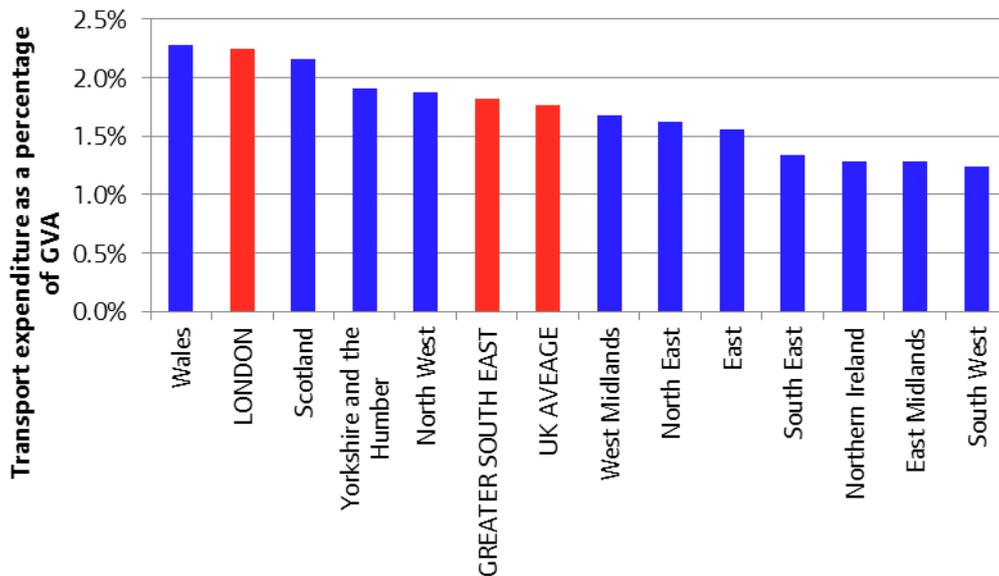
A measure of economic activity is gross value added (GVA). This shows the value of goods and services produced in an area and defined as output minus the cost of inputs associated with that production (i.e. intermediate production). London’s GVA was valued at £378.4 billion in 2015, according to data published by the ONS²³. London’s share of total economic output for the UK was 22.7 per cent, which was more than the North East (3 per cent), North West (9.4 per cent) and Yorkshire and the Humber (6.6 per cent) combined.

Combining these GVA estimates with the public sector’s transport expenditure suggests the amount spent on transport in London was only 2.2 per cent of its economic output in 2015-16. While that was higher than the UK average of 1.8 per cent, it was broadly comparable with Wales and Scotland. In addition, if looking at the wider functional area of the Greater South East which arguably enables more like-for-like regional comparisons (see Box 3); then transport expenditure was the equivalent of 1.8 per cent of its economic output. Consequently, on this

²³ ONS Regional gross value added (income approach)

basis, it does not appear that London and the surrounding area receives substantially more transport investment than other UK regions when considering its economic contribution.

Figure 12: Public sector expenditure on transport as a percentage of GVA by region in 2015-16



Source: HM Treasury PESA, ONS Regional GVA

Even looking at total public sector expenditure, the amount spent in London as a percentage of GVA was 27.1 per cent in 2015-16. That was the lowest for any UK region and much below the average of 42.4 per cent.

Expenditure as a share of tax revenue

Public sector expenditure made in London should also be considered in terms of the tax contributions the capital makes. The ONS has produced experimental statistics showing public sector revenue and expenditure by UK region which can be used for this purpose²⁴. This suggested that London generated £136.7 billion in taxes in 2015-16²⁵. That was one-fifth of the UK total making it the largest tax contribution for any UK region. However, London only received £110 billion in public expenditure during the same financial year²⁶.

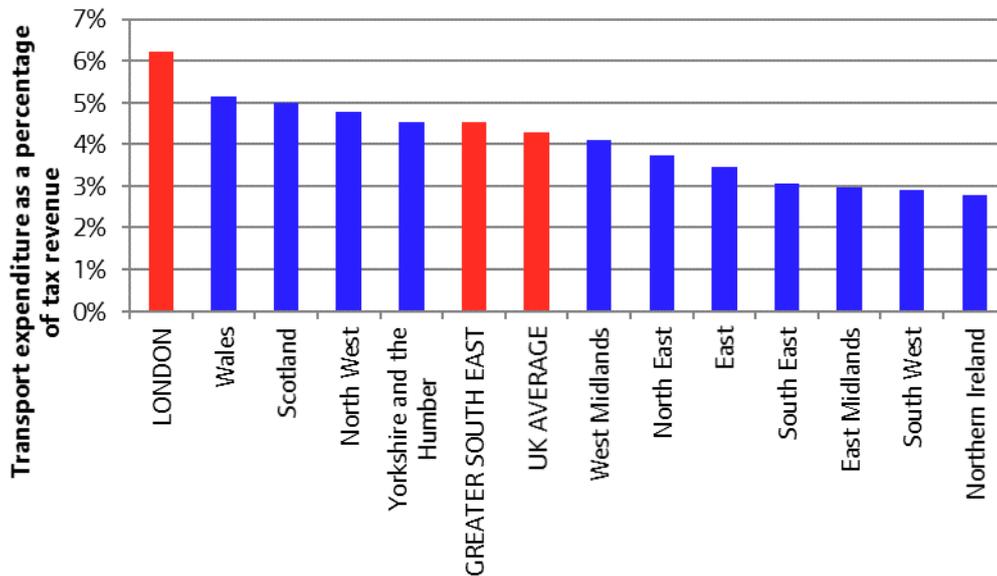
The amount of public sector expenditure spent on transport can be compared with a region's tax contribution. On this basis, transport spending by the public sector in London was the equivalent of 6.2 per cent of its tax revenue in 2015-16. However, the more comparable area is the Greater South East (see Box 3) which received around 4.5 per cent of its tax contributions in transport expenditure. That was broadly in line with the UK average of 4.3 per cent as can be seen in Figure 13. These findings should also be considered alongside the fact that the capital is a net contributor to public finances; so, while London may receive proportionally more transport expenditure, it receives proportionally less at an aggregate level.

²⁴ ONS Country and Regional Public Finances

²⁵ This does not mean the tax revenue raised in London is retained in the capital and spent on transport. Due to the way that government finance operates, for most taxes, the revenue is pooled centrally and then either spent directly by central government or redistributed back to the regions and spent locally.

²⁶ Due to different methodologies, this does not necessarily equal the estimate from the PESA data.

Figure 13: Public sector expenditure on transport as a percentage of tax revenue by region in 2015-16



Source: HM Treasury PESA, ONS Country and Regional Public Finances

Planned investments

The National Infrastructure and Construction Pipeline (NICP) sets out the planned investment in infrastructure. Unlike the PESA data used above, the NICP covers both public and private sector projects, but it is not a complete source of all planned infrastructure projects and there is a risk that some of these investments will not go ahead. The London-based projects could also be over a longer time period than other regions (i.e. because of TfL's business plan and the Mayor's Transport Strategy that looks over a long-time horizon) meaning regional comparisons may not be on a like-for-like basis. Overall, the NICP suggests that there is a total of £435.9 billion of investment in the pipeline in England, of which £134.5 billion (or 30.9 per cent) is specifically related to transport. Solely looking at London, the total value of planned infrastructure investments was £77.4 billion, of which £35.5 billion was specifically for transport.

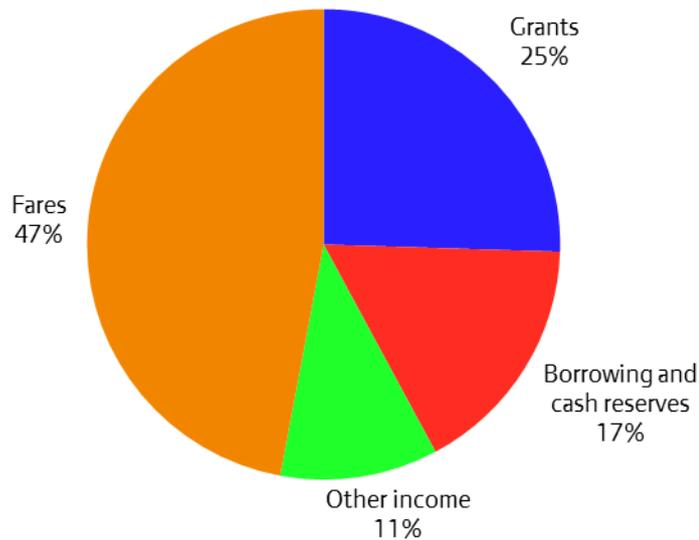
Analysis of the NICP produced similar trends to the PESA data. For example, planned transport investment per head in London (£4,090) was higher than the English average (£2,455). However, if comparing with economic activity (which is arguably the better comparison given transport is essential in supporting the economy), then planned expenditure as a share of GVA in London (9.4 per cent) was on par with the English average and suggests that planned spending in the capital is broadly in proportion to the size of its economy. This analysis is discussed in greater detail in Appendix 1.

Most of London's planned transport expenditure included in the NICP is by TfL (including Crossrail). This includes specific projects such as the Tube line and station upgrades, Crossrail 1 and surface transport. However, most of the funding for these projects actually comes from London businesses and residents rather than central government. For example, the largest source of funding for TfL is fare income accounting for almost half (47.1 per cent) of its budget in 2017-18²⁷. Grant income and Crossrail funding from central government and the GLA

²⁷ Transport for London (2017). Budget 2017-18.

meanwhile only accounted for 25 per cent of its budget. Income from other sources – such as the Congestion Charge, road network compliance charges, advertising and other commercial opportunities – accounted for 10.8 per cent of TfL’s budget and this share is expected to rise in the future.

Figure 14: Sources of funding for Transport for London in 2017-18



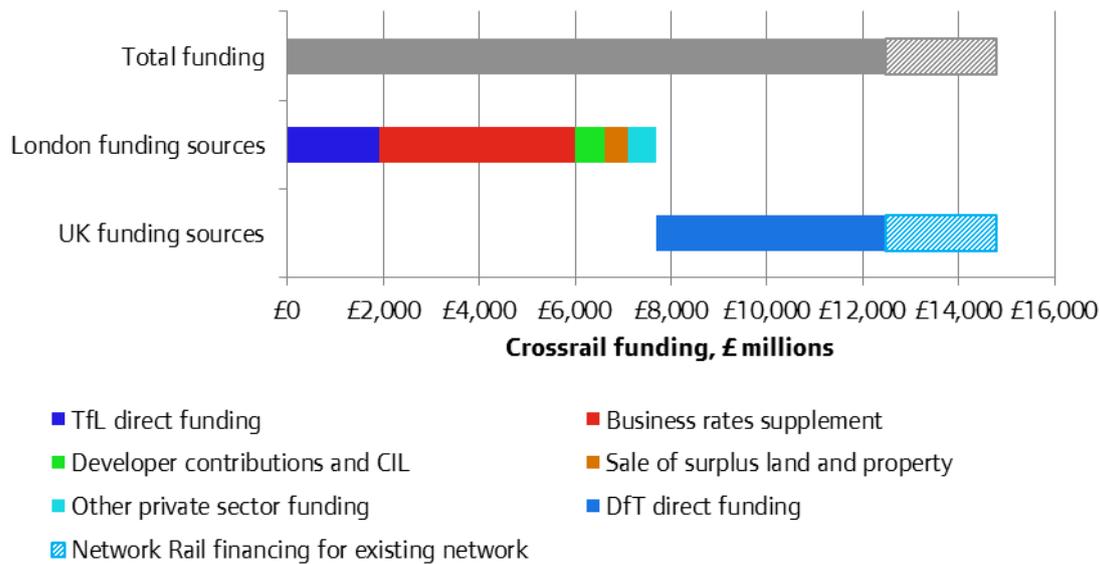
Source: *Transport for London Budget 2017-18*

The extent to which London is paying for its own transport infrastructure can also be seen by looking at specific projects. For Crossrail 1, more than half of the cost comes from Londoners and London businesses (Figure 15), which rises to more than 60 per cent if Network Rail improvements are excluded (as some of this expenditure would have happened anyway)²⁸. For instance, £4.1 billion of funding comes from the Crossrail Business Rates Supplement (BRS). This is an extra charge of 2p in the pound for London firms with properties with a rateable value of more than £70,000, covering around one-in-five hereditaments in the capital²⁹. So, a business premise with a rateable value of £100,000 will pay £2,000 per annum from 2010 to the 2030s. The BRS income is ring-fenced meaning that it is an extra ‘levy’ on London businesses to pay only for Crossrail and does not ‘take away’ funds from other transport projects. Another large chunk of funding comes directly from TfL where, as discussed above, almost half of its income comes from fare revenue alone.

²⁸ National Audit Office (2014). Crossrail, HC 965, session 2013-14, 24 January 2014.

²⁹ This was previously £50,000 using the 2010 ratings list.

Figure 15: Funding sources of Crossrail, £ millions



Source: National Audit Office

Looking at another example, the Northern Line Extension (NLE) is being funded by a tax incremental financing (TIF) deal between the GLA, TfL and the London boroughs of Wandsworth and Lambeth³⁰. The TIF operates by the GLA taking a £1 billion loan to cover the cost of the NLE – with central government acting as the guarantor – which will be repaid back mostly through future growth in business rate income. As such, this required the creation of a new enterprise zone – the Nine Elms enterprise zone – whereby the incremental business rates generated will be retained to pay back the loan. Developer contributions such as Section 106 and the Community Infrastructure Levy will also be used to repay the loan. Consequently, the future beneficiaries of the NLE (i.e. the businesses and developers that choose to locate there) are in essence also ‘paying’ for the infrastructure instead of it coming from the public purse.

Similarly, the proposed Silvertown Tunnel is expected to be financed using a public private partnership (PPP) arrangement³¹. This will involve the private sector being responsible for paying for the construction and ongoing maintenance of the tunnel. In return, TfL will pay the private sector for using the tunnel over a 25-year period. TfL itself will make these payments by setting and collecting a toll charge. Therefore, it is envisioned that the future users of the tunnel will in effect ‘pay’ for it rather than the Exchequer.

Historically, TfL and its predecessors have used a range of methods to fund transport infrastructure³². The construction of the M25, Croydon Tramlink and the East London Line extension (now a part of London Overground) were at least initially funded by private finance initiatives (PFIs). This usually involved the private sector funding the infrastructure project initially and then being repaid by the public sector or ‘users’ over a set time period (like PPP arrangements). However, there are disagreements as to whether PFIs provide value for money and are used much less frequently nowadays. Other projects including the DLR and Jubilee Line

³⁰ Transport for London (2013). Northern line extension – factsheet 1: funding and finance.

³¹ Transport for London (2016). Silvertown tunnel: 4.2 funding statement, TR010021, April 2016.

³² Travers, T (2009). Transport infrastructure in London, *Oxford Review of Economic Policy*, 25, 3, pg.451-468.

extension were alternatively funded by government grant, while the Heathrow Express was entirely funded by the private sector operators of Heathrow Airport.

Overall, the above examples show how London has paid or will pay a proportion – if not all – of the cost of its transport infrastructure projects. Moreover, this share is likely to increase in the future. This is a result of devolution deals which means London will become increasingly more responsible for its own government finances and expenditure. For instance, in return of a higher share of locally raised business rates, the GLA has taken responsibility for funding the TfL investment grant from April 2017. This previously was the responsibility of the Department for Transport (DfT) and was funded by their departmental budget.

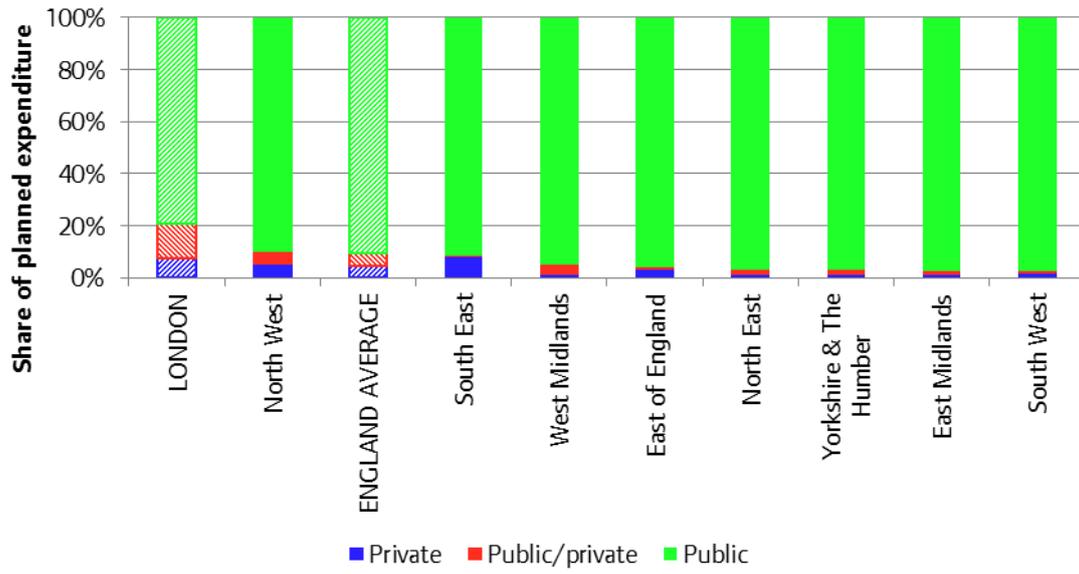
In addition, while not directly going towards capital investments, TfL will no longer receive a general grant from DfT from 2018-19 onwards and will instead be expected to cover its own operating costs. In 2017-18, the general grant awarded to TfL was £228 million which was already down from £447 million in 2016-17.

Similarly, revenue from the Vehicle Exercise Duty (VED) will be ring-fenced from 2020 for spending on the strategic road network (having previously contributed to the Exchequer's pool of funds). However, only small parts of the strategic road network run into London meaning that the capital is likely to lose out on this funding.

However, the fact that London bears some of the cost of its transport infrastructure is not reflected in the PESA data. That is because it is focussed on who is responsible for the expenditure rather than how it was funded. So, all the spending by TfL is considered to be public sector expenditure despite its funding coming from a number of locally borne sources. Consequently, the regional comparisons made in the previous section are not necessarily on a like-for-like basis.

It is a similar issue for the NICP data whereby TfL is categorised as being publicly financed. In addition, while the NICP does have a category for projects that are funded using a mix of public and private money, it does not give an indication as to the share. Consequently, there is no way to differentiate a project that is mostly financed by the private sector to one that is mostly funded by the public sector. Given these caveats, another way to illustrate the extent to which London pays for its own infrastructure is to look at the amount of planned expenditure in the NICP that is funded entirely by the public sector to ensure like-for-like comparisons. On this basis, around 79.4 per cent of the planned transport infrastructure in London will be funded entirely by the public sector. That is by far the lowest share among the English regions, with the average for England being 90.5 per cent. Consequently, this similarly suggests that London is paying proportionally more for its own infrastructure investments in comparison to other regions.

Figure 16: Planned transport infrastructure spending from 2016-17 by funding source and English region, constant prices



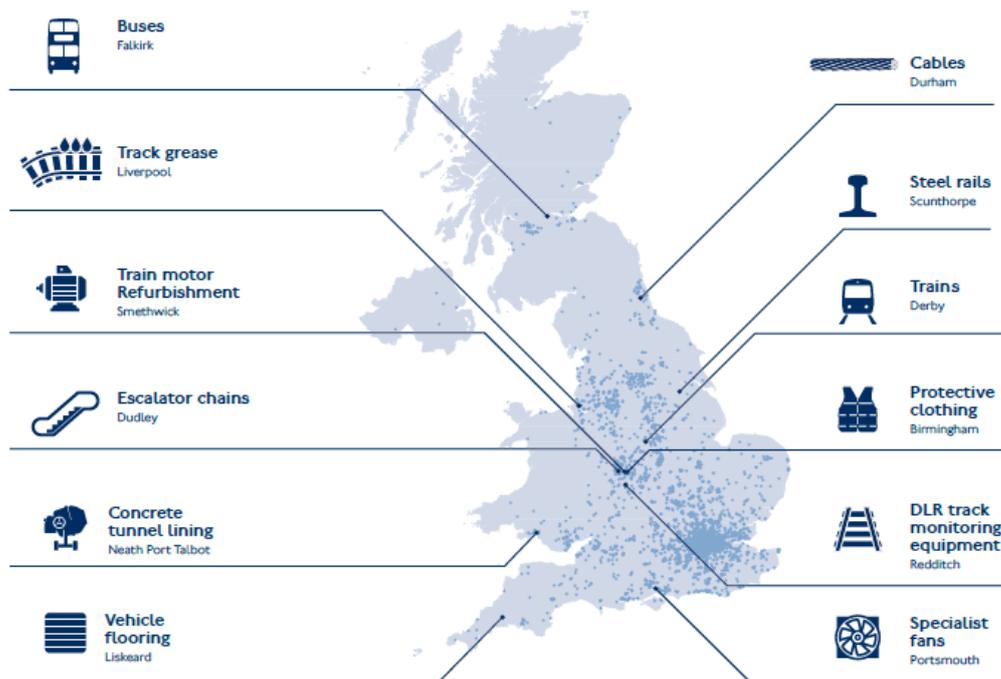
Source: National Infrastructure and Construction Pipeline (December 2016)

4 Wider benefits of investing in London's transport system

The current and planned investment in London's transport network discussed in the previous chapter can be beneficial to both the capital and other parts of the UK. As outlined in the [Growing Together II](#) report by GLA Economics³³, when London grows, the rest of the UK grows too.

One way that London's transport infrastructure benefits the rest of the UK is through the supply chain. Goods and services needed to construct and run the transport network, such as the raw materials, equipment and parts, can come from across the UK. Consequently, when transport investment is made in London it spurs economic activity elsewhere. For example, TfL (including Crossrail) works with thousands of suppliers across the UK with each of these represented with a dot in Map 2. This includes the construction of new buses in Falkirk, the construction of new Overground trains in Derby and steel rails from Scunthorpe. Altogether, around 60 per cent of TfL spending through its supply chain goes to suppliers outside of London and supports approximately 50,000 jobs³⁴. In addition, TfL (including Crossrail and the London Transport Museum) and its suppliers have created over 7,700 apprenticeships since 2009.

Map 2: Transport for London's supply chain in 2016-17



Source: *Transport for London Draft Annual Report 2016-17*

While these supply chain effects exist, there is no official data that quantifies this intra-regional trade in the UK. However, previous analysis by GLA Economics produced estimates of London's trade balance with the rest of the UK in 2011³⁵. This used several imperfect assumptions to scale down the national input-output tables – data that shows the sales and purchases relationships between producers and consumers within an economy – to London. These estimates are shown

³³ GLA Economics (2014). *Growing together II: London and the UK economy*.

³⁴ Estimates calculated independently by Regeneris Consulting. See: *Transport for London Draft Annual Report 2016-17*

³⁵ GLA Economics (2014). *Growing together II: London and the UK economy*, 30 September 2014.

in Table 4 and suggest that London imports a significant amount of goods and services from the rest of the UK (approximately £287 billion in 2011). Looking at the transport sector which is grouped with the distribution and hotels and restaurants industries as well, London supported and complemented activity in the rest of the UK by importing around £18.7 billion of goods and services in 2011.

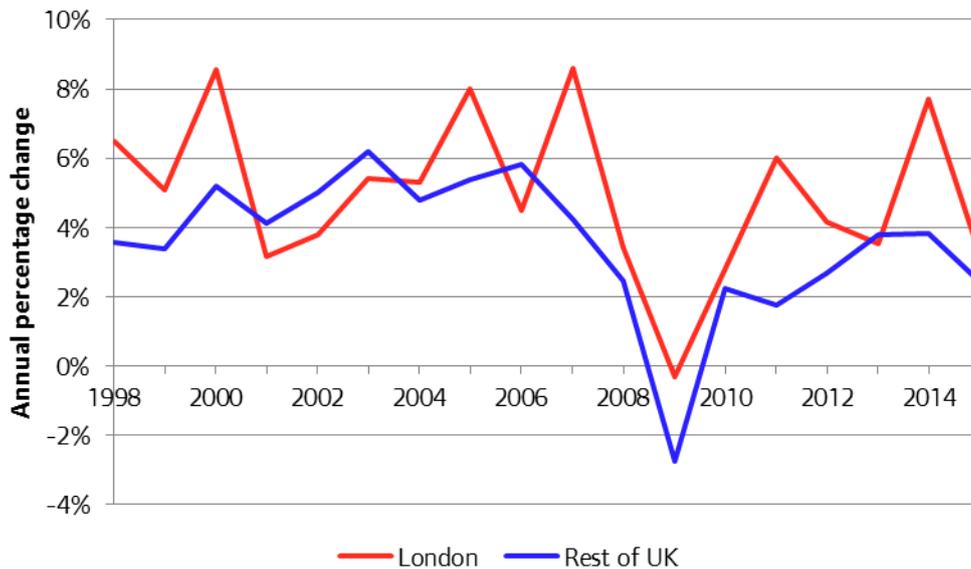
Table 4: Estimates of the trade of goods and services between London and the rest of the UK in 2011, £ billions

Industry	Regional exports	Regional imports	Trade balance
Agriculture	£0.2	£2.8	-£2.7
Production	£45.4	£91.9	-£46.5
Construction	£17.7	£17.6	£0.1
Distribution, transport, hotels and restaurants	£29.2	£18.7	£10.6
Information and communication	£35.6	£29.9	£5.6
Financial and insurance	£53.8	£28.9	£24.9
Real estate	£40.2	£24.1	£16.1
Professional and support activities	£19.8	£8.3	£11.5
Government, health and education	£59.8	£50.8	£9.0
Other services	£14.6	£14.1	£0.5
Total	£316.2	£287.0	£29.2

Source: GLA Economics (2014). *Growing together II: London and the UK economy*, 30 September 2014

As a result of this intra-regional trade between London and the rest of the UK – especially where investment in London can boost economic activity in other regions – it is unsurprising to note that economic growth in London and the rest of the UK follow broadly similar trends (Figure 17). In fact, the correlation between the two rates of nominal GVA growth is positive at 0.63 between 1997 and 2015.

Figure 17: Annual nominal GVA growth for London and the rest of the UK between 1997 and 2015



Source: ONS Regional GVA

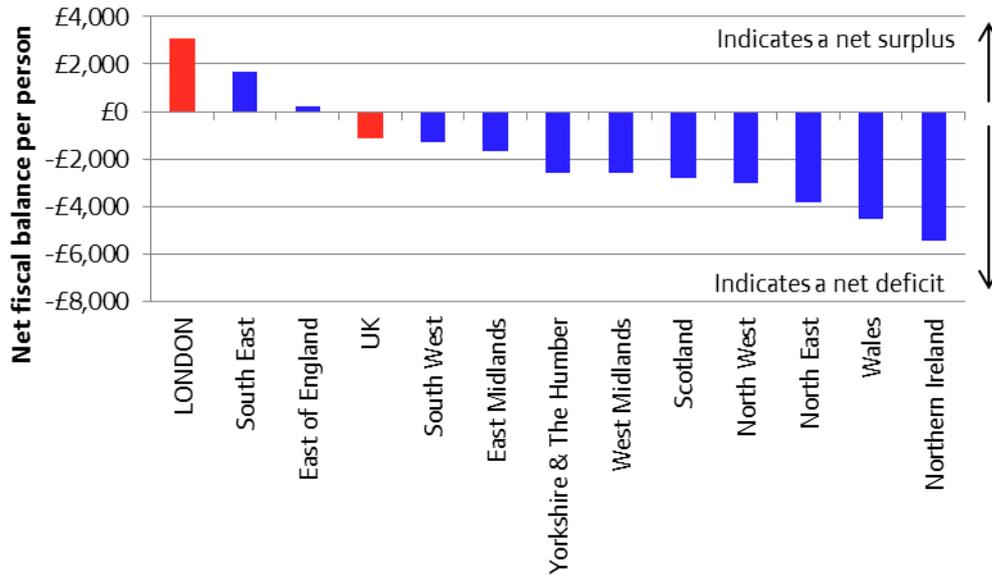
Currently, GLA Economics is looking at this intra-regional trade in greater detail, with the findings to be published at a later date.

Investing in London’s transport network should also be viewed as ensuring that the capital remains internationally competitive. The transport system creates the agglomeration benefits that have helped London’s economy to grow and become increasingly specialised. Consequently, not investing in London’s transport system would risk losing London’s competitive advantage which would be a detriment to the UK as a whole and not just the capital.

In addition, as noted in the previous chapter, London is a net contributor to the UK’s public finances. That is, it raises more in tax revenue than what it receives in public sector expenditure. Consequently, investing and supporting London’s economy can help generate taxes of which a proportion is spent elsewhere. This can be seen using experimental regional estimates of the public sector revenue and expenditure from the ONS (Figure 18)³⁶. This suggests that London raised £15,750 in taxes per person – the highest for any UK region – yet received £12,690 in expenditure per person in 2015-16. This meant that London had the highest net fiscal surplus to the UK’s public finances of £3,070 per person overall.

³⁶ ONS Country and Regional Public Sector Finances

Figure 18: Net fiscal balance per person by UK region in 2015-16



Source: ONS Country and regional public sector finances

Given all of the above points, investing in London’s transport network should not be seen as a ‘zero-sum game’ with other UK regions. Investing in the capital can support economic activity in other parts of the UK. In addition, as noted in the previous chapter, a proportion of this expenditure is funded by Londoners and London businesses; thus, not taking resources away from other regions. It should also be noted that different regions (and cities) have different economic requirements and consequently need different policy responses. For example, the [Centre for Cities](#) argues that some places will need transport infrastructure, while other places require investment in education, skills and planning³⁷. This means that comparing transport investment across regions is again not necessarily accurate as some regions (i.e. London) need transport infrastructure more than others.

³⁷ Swinney, P (2017). 10 ideas for a successful place-based industrial strategy, Centre for Cities, 11 April 2017.

5 Conclusions

A key objective of the Government's Industrial Strategy is to boost productivity and improve economic growth. This paper suggests that this could be achieved to some extent by investing in transport infrastructure. However, congestion and overcrowding – which is particularly an issue for London – does pose a question as to whether the transport infrastructure and future investment is enough to support economic growth in the future.

Given these points, this paper presented statistics showing the current levels of public sector investment in transport infrastructure in London and other parts of the UK. While initially approximately 29.1 per cent of the UK's public sector expenditure on transport was made in London in 2015-16, this does not consider the need or demand for transport. For example, London had one of the lowest amounts of railway expenditure per passenger journey in Great Britain and also in terms of road spend per 1 million vehicle miles. This is also true when looking at the Greater South East which, given the large number of commuters into London and the urban characteristic of the capital, is a better like-for-like comparator with other regions. In addition, given that transport is essential in supporting an economy, a more 'rational' comparison is with the amount of economic activity. On this basis, transport expenditure in London and the surrounding area as a share of its GVA is largely in line with the UK average.

Moreover, this public sector expenditure is increasingly being funded directly by London taxpayers. For example, more than half of the cost of Crossrail 1 is funded directly by Londoners and London businesses. This includes the Crossrail business rate supplement which is an additional tax paid by London businesses. In addition, around half of TfL's budget comes from local sources (i.e. fare revenue and other commercial sources). Importantly, this share of transport expenditure borne locally is likely to increase in the future as and when more fiscal powers are devolved to London. However, the fact that London is directly contributing to the cost of transport projects is not shown in the public sector expenditure data used above. That is because it is more focussed on who is responsible for the spending (with TfL categorised as being local government for example) rather than how it was funded.

Investing in London's transport network is also beneficial, and not at the expense of other parts of the UK. Investing in London can create demand for goods and services along the supply chain, such as the construction of new buses in Falkirk. For instance, TfL estimates that around 60 per cent of its spending through the supply chain occurs outside of the capital and helps support 50,000 jobs. It can also ensure London remains internationally competitive and generate taxes of which a proportion is spent elsewhere given that the capital is a net contributor to the Exchequer. Consequently, overall, when transport investment is made in London, it stimulates economic activity in the capital and other parts of the UK.

Appendix 1: Analysis of the National Infrastructure and Construction Pipeline

While the analysis presented in the main body of this paper is based on HM Treasury PESA data, an alternative dataset is the National Infrastructure and Construction Pipeline (NICP) collected by the Infrastructure and Projects Authority. The NICP sets out the planned investment in infrastructure across the public and private sectors (see Box 4)³⁸. While the pipeline is not a complete source of all planned infrastructure projects and there is a risk some of these investments will not go ahead, it suggests that there is a total of £502.4 billion of investment in the pipeline across the UK. Of this, £138.3 billion (or 27.5 per cent) is specifically related to transport infrastructure.

Box 4: The National Infrastructure and Construction Pipeline

Building on the National Infrastructure Delivery Plan, the Infrastructure and Projects Authority (IPA) – a government centre that supports the successful delivery of all types of infrastructure and major projects – collated information about planned infrastructure across the UK. This was published for the first time in December 2016 and will be updated annually thereafter as part of the National Infrastructure and Construction Pipeline (NICP).

The NICP covers both public and private sector investment in infrastructure. It predominantly includes large capital projects with a value of more than £50 million, though some smaller projects are also included. While completed projects are removed from the NICP, new projects are added once they have been announced. However, it does not necessarily mean that these projects will actually go ahead.

The information within the NICP can be broken down by sector. In total, there are 15 sectors including housing, transport, energy, digital communication, education and justice among others. In addition, it can also be broken down by the type of finance used to fund the infrastructure project (i.e. public or private sector funding or a mix of both).

It can also be split by region for which the spending relates. However, while the pipeline refers to planned infrastructure across the UK, it mostly relates to spending in England. That is because most of the infrastructure spending in Scotland, Wales and Northern Ireland is the responsibility of each devolved administration and, therefore, not included in the NICP. Furthermore, some spending cannot accurately be allocated to a specific region because it covers a number of regions or relates to the country as a whole (for example, High Speed 2). Overall, the IPA noted that around 60 per cent of the value of projects in the NICP up to 2020-21 cannot be allocated to an individual region.

It is possible to attribute the planned investment included in the NICP to specific regions of the UK. However, approximately 60 per cent of the total spend within the pipeline relates to more than one region or to the country as a whole. This has been attributed to each region on a per capita basis³⁹ (like with the PESA data above). In addition, as discussed in Box 4, most of the infrastructure spending in Scotland, Wales and Northern Ireland is not included in the NICP as it

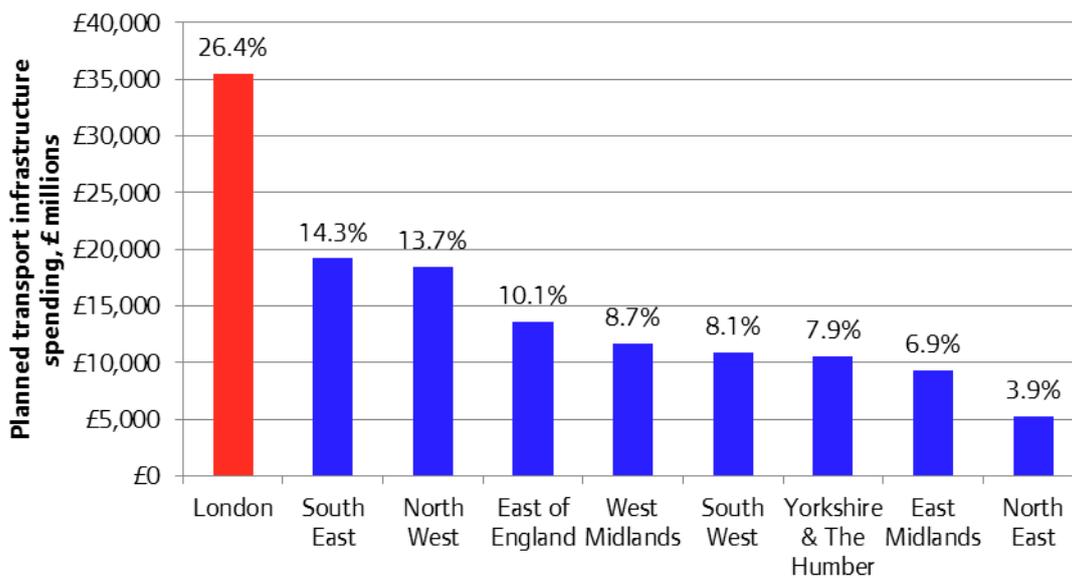
³⁸ <https://www.gov.uk/government/collections/national-infrastructure-plan>

³⁹ Based on the regional share of population in 2015

is the responsibility of the devolved administrations. Therefore, this appendix focuses on the planned investments in England only.

Given the above, the total amount of planned spending included in the NICP was approximately £435.9 billion across England. Specifically, for London, planned infrastructure expenditure was £77.4 billion or 17.8 per cent of the England total. Looking only at transport related infrastructure projects, the value was £35.5 billion for London which was around a quarter (26.4 per cent) of the England total of £134.5 billion (Figure 19).

Figure 19: Planned transport infrastructure spending from 2016-17 by English region, constant prices

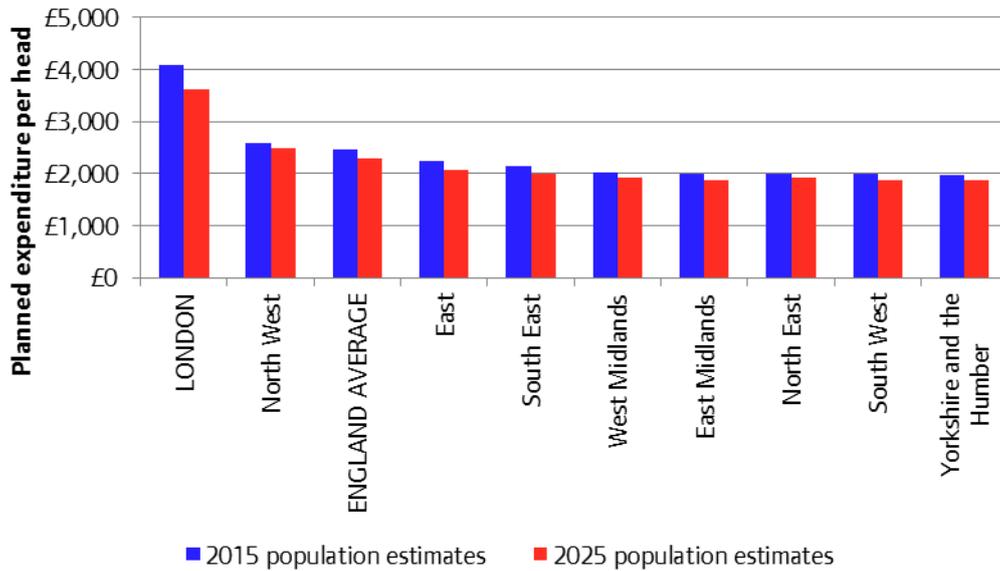


Source: National Infrastructure and Construction Pipeline (December 2016)

On a per head basis, the amount of planned transport investment in London was approximately £4,090 per person based on the usual resident population in 2015. That was two-thirds larger than the England average of £2,455 per head. However, given that this refers to future transport infrastructure, it may be more appropriate to use projections of the future population. The ONS produces population projections for the UK regions and, in particular, estimates that London’s population could rise from 8.7 million in 2015 to 9.8 million by 2025⁴⁰. Using these estimates, the planned transport expenditure per person in London based on the population in 2025 is instead £3,620, though that was still larger than the England average of £2,290 (Figure 20).

⁴⁰ It should be noted that the GLA Intelligence Unit produces its own population projections for London and alternatively suggest that its population could rise to 9.6 million by 2025.

Figure 20: Planned transport infrastructure spending from 2016-17 per head (resident population) by English region, constant prices

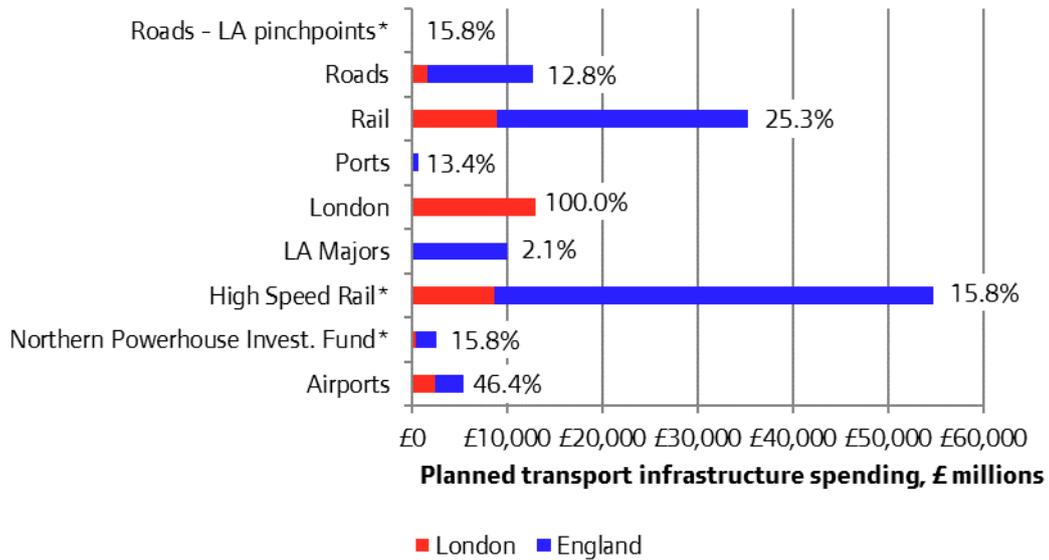


Source: National Infrastructure and Construction Pipeline (December 2016), ONS 2014-based population estimates

Similarly, planned transport infrastructure spending in London as a share of GVA was 9.4 per cent. That was in line with the English average (9.4 per cent) and suggests the amount of planned transport expenditure in London is broadly in proportion to the size of its economy.

Planned transport infrastructure can be further broken down by spending area, such as airports, rail and roads. While these breakdowns are shown in Figure 21, direct comparisons cannot easily be made between regions. That is because a large proportion of future spending in London is classified as “London” which mostly refers to TfL investment and is essentially an agglomeration of both the rail and road categories among others. For instance, it includes station upgrades, surface transport and river crossings as well as other projects.

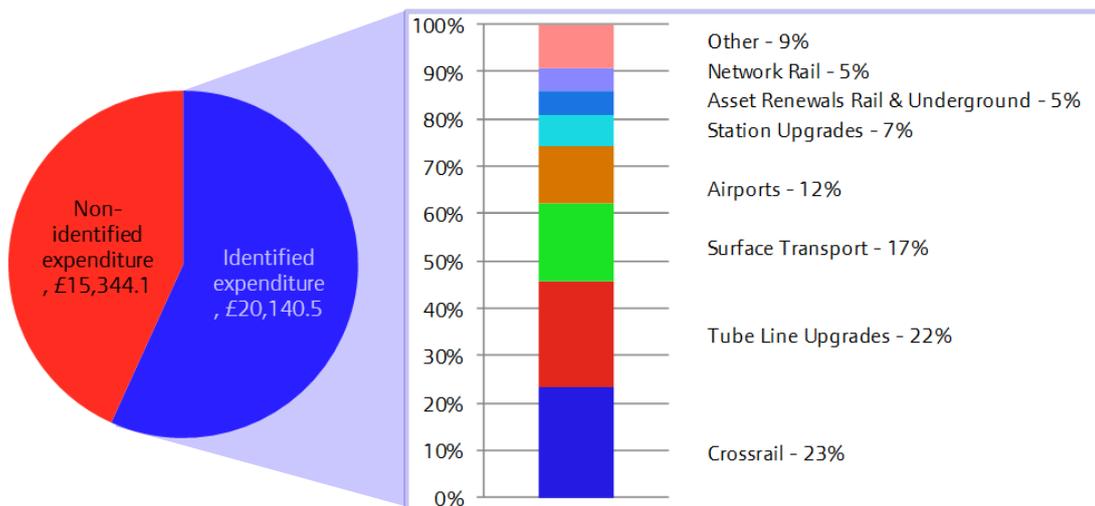
Figure 21: Planned transport infrastructure spending from 2016-17 by sub-group for London and England, constant prices, £ millions



Note: sub-groups with an asterisk have no regional data and have consequently been apportioned to regions on a per capita basis. London's share of the England total are shown next to the bars. Source: National Infrastructure and Construction Pipeline (December 2016)

In fact, if only looking at planned expenditure solely attributed to London (so, unlike the above, this does not include any non-identifiable expenditure that had been apportioned to London on a per capita basis), most of the spending is on Crossrail 1, Tube upgrades and surface transport.

Figure 22: Planned transport infrastructure spending from 2016-17 by sub-group and project in London, constant prices, £ millions



Source: National Infrastructure and Construction Pipeline (December 2016)

Appendix 2: Public sector transport expenditure by UK region data tables

Table 5: Public sector expenditure on transport by UK region between 2004-05 and 2015-16, constant 2015-16 prices, £ millions

Region	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
North East	£583	£616	£699	£682	£698	£747	£718	£623	£557	£581	£634	£804
North West	£2,148	£2,104	£2,281	£2,336	£2,373	£2,581	£2,289	£2,087	£1,825	£1,820	£1,937	£2,934
Yorkshire	£1,143	£1,205	£1,464	£1,374	£1,625	£1,641	£1,521	£1,471	£1,505	£1,568	£1,543	£2,092
East Midlands	£1,069	£1,074	£1,189	£1,259	£1,191	£1,272	£1,110	£1,023	£837	£964	£1,059	£1,252
West Midlands	£1,538	£1,504	£1,676	£1,668	£1,757	£1,588	£1,342	£1,246	£1,275	£1,264	£1,474	£2,007
East	£1,253	£1,314	£1,578	£1,608	£1,529	£1,895	£1,992	£1,797	£1,420	£1,490	£1,608	£2,267
London	£4,923	£5,341	£5,418	£5,475	£4,974	£6,534	£5,769	£5,677	£5,372	£5,459	£5,914	£8,505
South East	£2,464	£2,356	£2,714	£2,686	£2,965	£2,542	£2,221	£1,985	£2,081	£2,390	£2,438	£3,334
South West	£1,200	£1,261	£1,493	£1,431	£1,435	£1,289	£1,220	£1,076	£1,044	£1,002	£1,132	£1,559
Scotland	£2,033	£2,238	£3,195	£3,271	£3,062	£3,242	£2,970	£2,893	£3,091	£2,992	£2,842	£2,748
Wales	£1,019	£1,051	£1,057	£1,085	£1,075	£1,183	£1,206	£1,135	£1,135	£1,061	£1,042	£1,269
Northern Ireland	£426	£443	£463	£629	£610	£646	£759	£648	£598	£546	£535	£443
UK total	£19,799	£20,508	£23,229	£23,501	£23,293	£25,160	£23,118	£21,663	£20,739	£21,135	£22,157	£29,215

Note: These figures include both identifiable and non-identifiable expenditure. Source: HM Treasury PESA

Table 6: Public sector expenditure on transport by sub-function and UK region in 2015-16, £ millions

Region	Local public transport	Local roads	National roads	Railway	Other transport	Total
North East	£67	£241	£155	£292	£48	£803
North West	£299	£640	£333	£1,464	£198	£2,934
Yorkshire & The Humber	£112	£441	£452	£981	£105	£2,091
East Midlands	£113	£327	£277	£434	£102	£1,253
West Midlands	£111	£457	£374	£832	£233	£2,008
East of England	£90	£586	£302	£1,168	£119	£2,266
London	£1,264	£406	£24	£6,487	£324	£8,505
South East	£140	£644	£709	£1,629	£212	£3,335
South West	£152	£531	£239	£524	£114	£1,559
Scotland	£271	£692	£709	£630	£447	£2,749
Wales	£45	£209	£294	£647	£75	£1,270
Northern Ireland	£43	£246	£18	£85	£50	£443
UK total	£2,706	£5,420	£3,887	£15,174	£2,028	£29,215

Note: These figures include both identifiable and non-identifiable expenditure. Also, totals may not match those in Table 5 due to rounding. Source: HM Treasury PESA

Table 7: Planned transport infrastructure spending from 2016-17 by sub-group and UK region, constant prices, £ millions

Region	Airports	Northern Powerhouse Investment Fund *	High Speed Rail *	LA Majors	London	Ports	Rail	Roads	Roads -LA pinch points *	Total
North East	£31	£126	£2,624	£561	£0	£26	£1,278	£582	£4	£5,232
North West	£917	£344	£7,172	£1,694	£0	£71	£6,595	£1,670	£11	£18,472
Yorkshire & The Humber	£64	£258	£5,389	£1,004	£0	£53	£2,624	£1,174	£8	£10,575
East Midlands	£55	£224	£4,676	£860	£0	£46	£2,277	£1,186	£7	£9,331
West Midlands	£68	£276	£5,749	£1,391	£0	£57	£2,880	£1,236	£8	£11,665
East of England	£366	£291	£6,074	£1,379	£0	£60	£3,070	£2,381	£9	£13,631
London	£2,506	£416	£8,671	£207	£13,010	£86	£8,949	£1,627	£13	£35,485
South East	£1,305	£429	£8,945	£1,557	£0	£185	£4,993	£1,778	£13	£19,205
South West	£93	£262	£5,469	£1,306	£0	£54	£2,664	£1,039	£8	£10,896
England total	£5,405	£2,625	£54,769	£9,960	£13,010	£638	£35,330	£12,674	£81	£134,492

Note: sub-groups with a star have no regional data and have consequently been apportioned to regions on a per capita basis. Source: National Infrastructure and Construction Pipeline (December 2016)

GLAECONOMICS

Greater London Authority
City Hall
The Queens Walk
London SE1 2AA

Tel 020 7983 4922
Fax 020 7983 4674
Minicom 020 7983 4000
Email glaeconomics@london.gov.uk

<http://www.london.gov.uk/gla-economics-publications>

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