

APPENDIX

IMPACT OF LOCAL BUS DECLINE 2011-2023 - DATA ANALYSIS

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HEADLINE FINDINGS

From 2011 to 2023, bus provision, defined as miles driven by buses per head¹, each year fell 28 per cent from 25 to 18 miles. Had bus provision stayed the same from 2011 to 2023, this would have meant an additional 395 million bus miles travelled in 2023 (DfT 2024a).

Meanwhile, the number of bus trips fell from 4.6 billion in 2011 to 3.4 billion in 2023 (ibid). Since 2020/21 alone, the number of local bus services registered has fallen by 27 per cent to 8,781 in England in 2022/23 and historic data suggest service reductions are longer standing² (TCGB 2024). These reductions in bus provision and patronage are detrimental economically, socially, and environmentally.

In this paper, these detrimental changes are explored alongside a discussion of the methodology used for estimating them.

ECONOMIC ANALYSIS

We have modelled the changes which have taken place in the economic contribution of local buses from 2011 to 2023:

- We estimate that the total employment in England in the local bus sector has fallen from around 94,000 employees in 2011 to 91,000 employees in 2023, a fall of around 3,000 jobs or 3 per cent.

¹ Annual total vehicle miles on local bus services adjusted for population in England

² We cannot explicitly compare older figures due to an identified error with older data presented by the Office of the Traffic Commissioner over several years

- In 2023, bus users spent almost £6.7 billion less in local economies in England than in 2011.
- The gross total economic contribution of the operation of local bus services and spending of its passengers in local economies in England (ie direct, indirect, induced, and dynamic economic impacts) has fallen from £34.1 billion GVA in 2011 to £25.1 billion in 2023, a gross decline of £8.9 billion or 26 per cent. Accounting for spending that will have moved to other modes (see methodology below), we estimate that in 2023 the economy was £2.6 billion smaller in terms of GVA than it would otherwise have been without the reduction in bus services and bus use since 2011.
- We estimate that the total jobs supported across the economy by local bus services in England was 423,000 in 2023. Accounting for spending that will have moved to other modes, we estimate that the number of jobs supported by the operation of local bus services and bus passengers' spending has net fallen 5 per cent, or some 39,000 net fewer jobs in the economy from 2011 to 2023.

SOCIAL ANALYSIS

We have further analysed changes in who uses buses and where bus provision has fallen most—with regard for income distribution and local deprivation.

We find that the reduction in bus miles between 2011 and 2023 is 10 times higher in the most deprived areas of England than in the least deprived areas.

In addition, while those living on the lowest incomes (bottom 20 per cent of household incomes) rely on buses the most out of all groups (both for number of trips and distance travelled), while middle-earners have seen the largest decrease in bus trips taken since 2011:

- for the lowest income quintile group, bus miles per person per year (including London) fell from 401 in 2011 to 282 miles by 2023, a 30 per cent reduction.
- for the second-, third-, and fourth-income level quintiles (ie households below 80 per cent and above 20 per cent of the household income distribution, so called 'middle-earners') bus miles per person per year contracted faster, falling 42 per cent, 41 per cent, and 44 per cent from 2011 to 2023 respectively.
- the lowest income quintile sees around 67 trips on the bus per person per year (including London) compared to the overall average of 39 trips, and 25 for the highest-income quintile.

Those without access to a car or van (personal vehicle) travel almost 4 times as many miles on a bus than those *with* access, highlighting that access to personal transport is a strong predictor of bus reliance.

This group without access to personal vehicle travel less overall. On average, they travel just 41 per cent of the overall distance that people who do have access do, with over 4,000 fewer miles per person per year travelled on average from 2011-2023.

From 2011 to 2023, those without access to a personal vehicle increased their miles travelled by taxi or minicab 29 per cent from 84 miles per person per year to 109, while bus miles per person fell 38 per cent from 742 to 458 miles. Meanwhile, taxi miles grew only 4 per cent for those with access to personal vehicles from 48 per person per year in 2011 to just under 50 miles per person per year in 2023.

ENVIRONMENTAL ANALYSIS

We have explored the environmental impact, particularly on emissions, of this reduction in bus provision and patronage over the 2011 to 2023 period:

- Bus cuts since 2011 have led to an estimated 750 million extra miles driven in cars in 2023, equivalent to driving between Lands End and John O’Groats 900,000 times in 2023 alone.
- The cuts have also led to an estimated additional 380 million extra taxi miles driven in 2023, bringing the total number of additional car miles to over 1.1 billion miles driven in 2023, equivalent to driving between Lands End and John O’Groats 1.3 million times in 2023 alone.
- Had those passengers who drove or took a taxi travelled on zero-emission buses instead, total emissions would have been 292 million kg CO₂e lower.
- Had services remained consistent since 2011, it might have resulted in an additional 4.7 billion bus passenger miles in 2023, which is equivalent to 114,000 extra cars on the roads in 2023 because of bus cuts.

ECONOMIC DISCUSSION AND METHODOLOGY

The key outputs of our model are an estimate of the GVA contribution of local bus services and an estimated total number of jobs supported by local bus services in 2011 and then 2023.

Table 1 GVA contribution of local bus services and the spending of their passengers in England by impact type, 2011-2023 (2023 prices)

Real terms GVA (£bn)	2011	2023	Change (£bn)	Change (%)
Direct	5.4	4.4	-1.0	-19%
Indirect	3.4	3.5	0.1	4%
Induced	1.3	1.1	-0.3	-19%
Dynamic	23.9	16.1	-7.8	-32%
Total GVA contribution	34.1	25.1	-8.9	-26%
Net dynamic change			-1.5	-6%
Total net change			-2.6	-8%

See below for methodology and sources. Note numbers may not sum due to rounding.

Table 2 Jobs supported by local bus services in England by impact type, 2011-2023

Jobs supported	2011	2023	Change	Change (%)
Direct	94,000	91,000	-3,000	-3%
Indirect	56,000	57,000	1,000	1%
Induced	22,000	17,000	-5,000	-22%
Dynamic	536,000	258,000	-278,000	-52%
Total jobs supported	708,000	423,000	-285,000	-40%
Net dynamic change			-31,000	-6%
Total net change			-39,000	-5%

See below for methodology and sources. Note numbers may not sum due to rounding.

Methodology

GVA calculations

There is no standing, annual data source or report which sets out the economic impact of local bus services over time. Each time total estimates of economic contribution have been created, it has been a bespoke exercise (see for example KPMG 2024).

Our goal has been to understand the change in buses' economic contribution over time, so that we can indicate the economic impact of reductions in bus provision (ie bus cuts) and bus patronage since 2011. Thus, we have sought to create an approach allowing us to make comparisons over time.

In developing this, we reviewed previous approaches—particularly Mackie et al (2012) and KPMG (2024), and have held discussions with experts ranging from academics, local transport authorities (LTAs) and industry stakeholders to understand the evidence landscape for buses' socioeconomic impact.

Following this review and engagement, we developed a methodology that we consider sufficiently robust to model this contribution. We have tested these approaches internally with other IPPR experts and have had our modelling and outputs quality assured. All figures have been rounded to the nearest 1,000 for employment and £0.1 billion for GVA and spending.

There are a range of ways to capture the economic impact of transport and transport investment. As above, we have chosen to focus on the **jobs** and **economic value in GVA**³ of local bus services, derived from:

1. The direct, indirect, and induced economic impact on the UK economy of providing local bus services in England
2. The dynamic economic impacts of bus passengers spending in England's local economies.

This means that several recognised impacts of local bus services do not form part of our estimates here, though remain useful. For example, we do not include the economic value of reduced congestion, of environmental and safety improvements, monetised health and well-being impacts, certain cost-benefit analyses such as option values, or the impact on local land values of improved public transport, which others have previously explored.

To estimate the economic contribution of buses and its change over time, we undertook the following analysis:

- We estimated the total number of employees working within the local bus service industry using employment estimates derived from the Office for National Statistics (ONS, 2024b) and Department for Transport (DfT, 2024a).
- We estimated the direct economic contribution of the operation of running local bus services to the overall economy in terms of GVA. Our GVA estimate is derived by calculating the labour productivity in Great Britain for the most granular sectoral definition available that included our definition of the local bus service industry (SIC Group 49.3 to 49.5) from the industrial analyses within the UK National Accounts Blue Book (ONS 2024e). By applying this productivity estimate to our total number of employees working within the local bus service industry, we estimated the total direct economic contribution in GVA of the operation of local bus services from 2011 to 2023.
- We made a range of evidence-based modelling assumptions to inform our impact model, drawing together different sources of evidence regarding total bus service industry employment, its annual economic value in GVA,

³ Gross Value Added (GVA) is the standard measure of economic output below the estimate of total national output measured in GDP, and is particularly used for sectoral or regional analysis. Simplistically, it is defined as the additional economic value created by that sector or place and is equivalent to the sum of operating surplus, employment costs, net taxes on production.

the structure of the UK economy and how economic value flows within it, and change in these over time in real terms. The different sources are from the ONS (2024b, 2024c, 2024d, 2024e, 2016), HM Treasury (HMT 2024), and KPMG (2024).

- We used Type I and Type II economic multipliers to estimate the indirect and induced impacts of the local bus service industry. The Type I multiplier was drawn from the Blue Book’s Input-Output tables (ONS 2024e). This captures the indirect impact, meaning the economic value generated through the sector’s supply chain spend. The Type II multiplier was informed by the Scottish Government’s Input-Output tables to enable us to make an informed approach about the induced impact of the local bus service industry on the UK economy, which means the economic value created by the spending of those working directly in the sector or whose jobs are supported indirectly through its supply chains.

Dynamic economic impacts

Per KPMG 2024, we define dynamic economic impacts as the impacts of bus passengers spending in local economies. We estimate that the total annual spending of bus passengers in local economies was nearly £50 billion in 2023.

Table 3 Estimated dynamic economic impacts of local buses, 2011-2023 (2023 prices)

Dynamic economic impacts	2011	2023
Total spending (£bn)	84.7	49.7
Net change (£bn)		-£6.7
GVA contribution (£bn)	23.90	16.1
Net change (£bn)		- 1.47
Jobs supported	536,000	258,000
Net change		- 31,000

See below for methodology and sources. Note numbers may not sum due to rounding.

To calculate these estimates:

- Total trips for commuting, leisure and shopping have been calculated using data of the number of journeys by purpose (DfT 2024b NTS0409a) and population.
- We used average spend estimates by bus passenger per journey to calculate total spend by bus passengers for each journey purpose in 2011 and 2023. We multiplied an estimated average spend per journey by purpose of journey by the total number of journeys for each purpose in that year. Average spends were derived from a range of sources including CPT 2023 and Laird & Mackie 2012, and aligned using ONS 2024f.
- We present net change figures because some spending will have been displaced rather than totally reduced. What that means, for instance, is that the total spending by bus passengers who are using a particular bus route in an example town centre will not entirely disappear from that local economy were that bus route to be cancelled. Rather, some of that spending will be displaced to another mode, like more people driving into

that example town centre. However, some spending will either not be able to switch to another mode or would not be spent in a different place absent of that particular bus route. Therefore, we have adjusted our estimate to account for that spending which will have been displaced. This was achieved by applying a diversion factor to the gross change in bus passenger spending from 2011 and 2023, and adjusting for this throughout our model. Our estimated diversion factor was 0.81, meaning that 19 per cent of spending is lost while 81 per cent would displace to other means. This was informed by Dunkerley et al (2018) and is further discussed in the environmental analysis below.

- These dynamic impacts are first order only, meaning that no indirect or induced multipliers were applied to them.

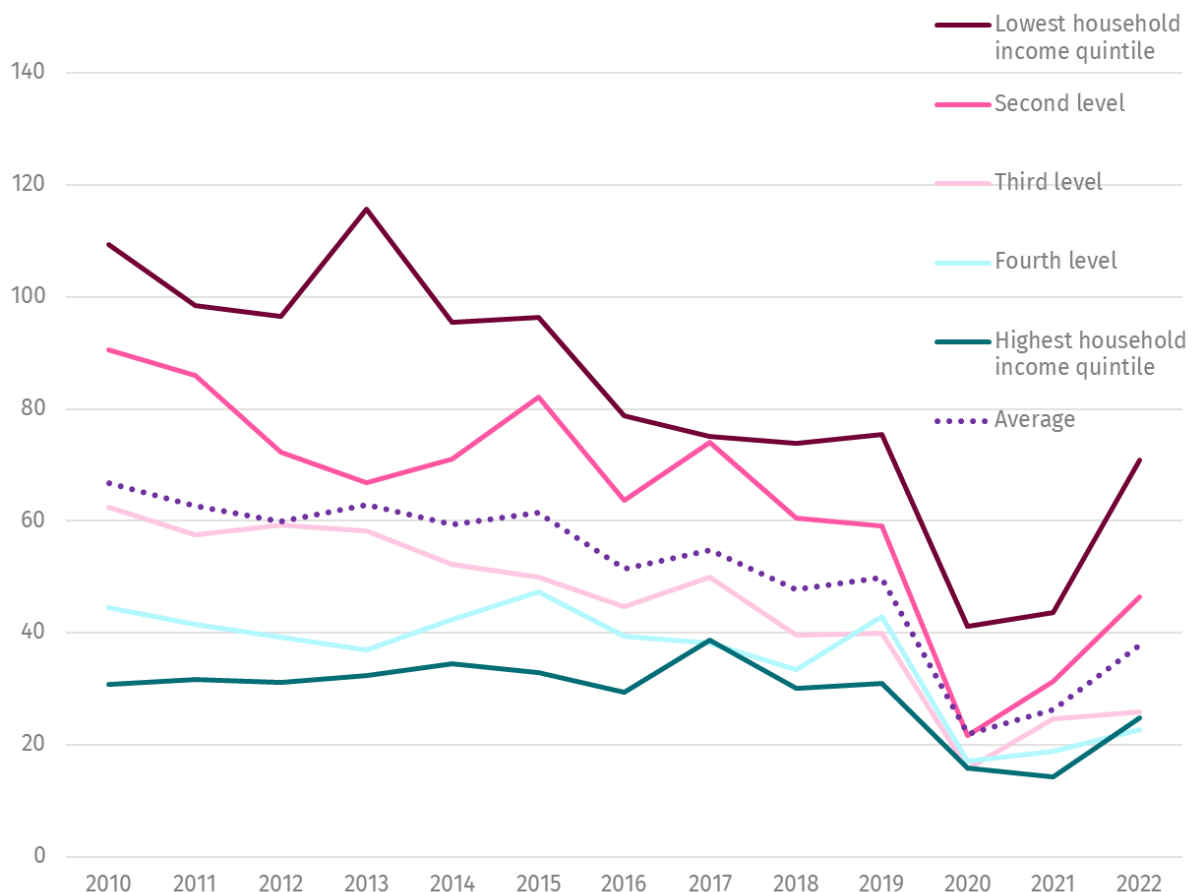
SOCIAL DISCUSSION AND METHODOLOGY

Bus use by household income

As highlighted above, according to our analysis of DfT 2024a, the lowest earners are the most intensive bus users by distance travelled, but it is middle income households who have seen the largest fall in bus miles.

We used data from the National Travel Survey (DfT 2024a) to break out change in travel habits by quartiles of household income from 2011 to 2023.

Figure 1 Bus trips per person each year (including London)



Source: Authors' analysis of DfT 2024a.

Analysing bus trips suggests similar findings. The reduction in both bus trips and bus miles for the lowest income group indicates that not only is this group not travelling as far when using buses, but are simply using buses less.

It is notable that while those in the lowest fifth of household incomes remain the most extensive bus users, they were not the income group which saw the largest fall in bus use rather this was middle income groups. This pattern is also observed when we analyse bus trips in the National Travel Survey data.

This may reflect a lower dependence on bus for higher earning groups, partly as the occupational makeup of higher-earning quintiles could allow more working from home and as higher-earning quintiles are more likely to have access to a car; more than one in four of the bottom income quintile (28.2 per cent) do not

have access to a car, compared to only 6 per cent among the wealthiest (Health Foundation 2024).

Bus use by access to a personal vehicle

According to our analysis, those who do not have access to a car or a van are travelling less overall, including less by bus, and they have increased reliance on taxis—the most expensive mode of travel. We used data from the National Travel Survey (DfT 2024a) and analysed the different travel patterns for households who did and did not have access to a personal vehicle (ie car or van).

Bus use by deprivation and place

According to our analysis of MHCLG (2019) and DfT (2024b), there is a relationship between deprivation and reductions in bus miles, where those areas with higher levels of deprivation have seen larger falls in bus miles than less deprived areas.

We have assessed the changes in bus miles in LTA areas – which are currently a combination of city regions (like Greater Manchester), counties (like Shropshire), and unitary authorities (like Blackpool).

We then used bus statistics data tables (DfT 2024b) to analyse bus provision at this geographical level.

Following, we assigned each LTA an Indices of Multiple Deprivation (IMD, MHCLG 2019) average score, using a population-weighted score approach as is standard with IMD analysis. We then ranked LTAs and sorted them into deciles by that score. Finally, we compared the average change in bus provision per person from 2011-2023 within each decile of LTA by decile of IMD average score.

We conclude from this that there is a relationship between local deprivation (as measured by the IMD average score) and the loss of bus provision since 2011 (measured in bus miles driven per person per year).

Table 4 Change in bus miles by IMD decile of local transport authority

Transport authority by decile of deprivation ⁴	2011-23 change in bus miles per person	2011-23 change in bus miles per person	Bus miles per person in 2023
1 (most deprived)	-34%	-9.79	17.75
2	-29%	-8.14	19.54
3	-22%	-6.76	20.37
4	-25%	-7.65	15.04
5	-20%	-5.81	18.19
6	-33%	-6.33	12.65
7	-36%	-6.92	11.28

⁴ For the purposes of comparing bus miles and deprivation, we have modelled an IMD ranking for transport authorities. Where transport authorities do not align to local authorities (eg London or South Yorkshire), we have estimated an average IMD score for transport authority areas in line with the methodology for assigning IMD scores to local authorities (see MHCLG 2019) and then ranked these to create deciles for transport authority areas.

Transport authority by decile of deprivation ⁴	2011-23 change in bus miles per person	2011-23 change in bus miles per person	Bus miles per person in 2023
8	-38%	-6.63	10.89
9	-28%	-6.87	13.55
10 (least deprived)	-13%	-0.92	10.49

Source: Authors' analysis of DfT 2024b and MHCLG 2019

According to this analysis, the reduction in bus miles per person is ten times higher in the 10 per cent most deprived areas compared to the 10 per cent least deprived areas, and 1.7 times higher than the median decile. This is shown above.

Only nine transport areas have not seen a reduction in bus miles per person from 2011 to 2023 – Southend-on-Sea, Buckinghamshire, Southampton, Thurrock, North Somerset, West Berkshire, East Sussex, South Gloucestershire, and Central Bedfordshire.

Looking at the percentage change (ie relative change) in bus miles, the top 10 areas that have lost the most bus provision between 2011 and 2023 are:

- Slough with a 70 per cent reduction in miles driven by buses per head (-19.27 miles driven by buses per head annually)
- Shropshire with a 68 per cent reduction in miles driven by buses per head (-10.37 miles driven by buses per head annually)
- Rutland, with a 67 per cent reduction in miles driven by buses per head (-8.95 miles driven by buses per head annually)
- Stoke-on-Trent, falling 63 per cent (-16.58)
- Bath and North East Somerset, falling 62 per cent (-26.08)
- Bracknell Forest, falling 57 per cent (-8.63)
- Milton Keynes, falling 56 per cent (-16.63)
- Telford and Wrekin, falling 54 per cent (-10.65)
- Warrington, falling 53 per cent (-11.93)
- Peterborough, falling 53 per cent (-13.02)

Meanwhile the top 10 transport authority areas that lost the most bus provision in number of miles driven by buses per head lost (ie absolute change) annually between 2011 and 2023 are:

- Bath and North East Somerset, where annual miles driven by buses per person have fallen 26.08 miles between 2011 and 2023
- Darlington, where annual miles driven by buses per person have fallen 19.74 miles
- Slough, losing 19.27 miles per person
- Milton Keynes, losing 16.63 miles per person

- Stoke-on-Trent, losing 16.58 miles per person
- Nottingham, losing 15.53 miles per person
- Plymouth, losing 15.31 miles per person
- Tyne & Wear ITA area, losing 14.22 miles per person
- Peterborough, losing 13.02 miles per person
- Merseyside ITA area, losing 12.16 miles per person.

ENVIRONMENTAL DISCUSSION AND METHODOLOGY

In order to explore the environmental impact of cuts to bus provision and falling bus patronage, we calculated miles driven by buses per head both in 2011 and 2023 and found it has fallen from 25 to 18 miles over that period, a reduction of 28 per cent.

We consider if this had stayed the same from 2011 to 2023, this would have meant an additional 395 million bus miles travelled in total in 2023. Given average bus occupancy of 11.9 (DfT 2024b), this is the equivalent of 4.7 billion fewer miles travelled by passengers overall.

We assumed that 24 per cent of these miles would now be taken by individuals in cars based on Dunkerley et al's (2018) diversion factors, equivalent to 1.1 billion passenger car miles. It is worth noting that there is great uncertainty over the extent to which lost bus journeys lead to additional car miles, referred to as the 'diversion factor', and it is likely that 24 per cent is an underestimation.

Given an average car occupancy of 1.5 (DfT 2024a), this is equivalent to 752 million additional car miles driven in 2023.

752 million miles is equivalent to driving between Lands End and John o'Groats 898,907 times, a distance of 837 miles (RAC 2021).

Given average annual mileage for a car of 6,600, this is also the equivalent of an additional 114,000 cars on the road (DfT 2024a).

We then assumed a further 12 per cent of those miles not taken by bus would now be taken by taxis informed by Dunkerley et al's (2018) diversion factors and the increase in taxi miles discussed above, equivalent to 560 million taxi passenger miles.

Given an average taxi passenger occupancy of 1.5, this is equivalent to 380 additional taxi miles (DESNZ 2023).

The total car and taxi miles travelled together is equivalent to 1.1 billion additional miles travelled.

We calculated total emissions using Defra (2023) published emissions factors, and used car emissions factors to account for the different fuel-types of vehicles on the road (DfT 2024d, DfT and DVLA 2024).

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