

Fare outcomes

Understanding Transport in Wales's Cities

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About Centre for Cities

Centre for Cities is a research and policy institute dedicated to improving the economic success of UK cities and large towns.

We are a charity that works with local authorities, business and Whitehall to develop and implement policy that supports the performance of urban economies. We do this through impartial research and knowledge exchange.

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About the partner

The Wales TUC exists to improve the economic and social conditions of workers in Wales, regardless of if they are currently in a job or not.

Its mandate and purpose builds on the role of its individual affiliated trade unions. Workers join trade unions to represent their interests, and these unions affiliate to the TUC to establish a shared agenda, agreed democratically at a Congress held every two years and managed by the General Council which meets four times a year.

Around 400,000 people are trade union members in Wales. The vast majority of these people are members of trade unions which are affiliated to the Wales TUC.



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Executive summary

The Welsh Government set out a policy goal to have 45 per cent of all journeys done by public transport and active travel by 2040, a goal that is likely to be important for the economy, for the environment and for access to amenities for those who don't own a car. This report sets out the differing roles of different parts of Wales will have in approaching this goal.

Public transport is inherently easier to provide in dense urban areas. Density increases the number of people living close to transport stops, making it more accessible, while it increases the pool of people willing to use public transport, making its provision more sustainable. The number of people relative to road space in these environments also increases congestion. These factors change the relative benefits of using public transport in comparison with private modes. For this reason, while noting that all areas of Wales will have a contribution to make to achieving the 45 per cent target, it is Welsh cities that will be the places that will need to make the largest contribution if Welsh Government is to achieve its overall goal.

Within this, Cardiff is the city with the greatest potential to significantly drive up public transport ridership. This is for two reasons. The first is that Cardiff has a much higher share of its jobs in its city centre than Swansea, Newport and Wrexham. Public transport can serve commutes that run to one point much easier than commutes that run to many points. The second is that congestion is higher in Cardiff than in the other cities. Both of these factors make public transport relatively more attractive than the car in comparison with other places, and explains why public transport ridership is already much higher in the capital than elsewhere.

A big challenge for Cardiff and the wider Cardiff Capital Region is the performance of its public transport network, which is governed by two factors. The first is how much area the network can serve within a given time, which is governed by the quality of public transport infrastructure. The South Wales Metro and the Cardiff Crossrail and Circle tram-train lines will go some way to

expanding this catchment area. The second is the number of people who live within this catchment area. Comparing the capital to Nantes, a similar-sized European city, shows how the density of residential development radically changes the number of people within a public transport catchment area, with Nantes far ahead in this respect. This means making the most of both the existing network and any future expansion will **require homes to be built around its stations and stops.**

The less dense urban form in other parts of Wales makes the car much more competitive than public transport. This is most clearly the case in rural areas, where the inherent low-density nature of development makes providing public transport a particular challenge. But it is also a barrier in Swansea, Newport and Wrexham. Comparing these cities to the similar-sized cities of Kiel and Aachen in Germany and Annecy in France reveals how much less dense they are. To really shift the economics of providing frequent and reliable public transport will require a big change in how these places are built. But, if pursued, this is a long-term policy goal.

In the short term, the most fruitful improvements to public transport in these places are likely to be around **expanding the number of high-precision, low frequency services that could serve edge-of-town industrial estates and business parks** to match work patterns, as has been done in places like Sunderland and Bristol. To do this will require information to be gathered on work patterns and the location of workers, and will require coordination between local government, employers and trade unions.

The policies above focus on the expansion of public transport networks. The Welsh Government and local authorities should look to maximise the performance of the existing system too. To do this, local authorities should **exempt bus lanes from the new 20mph speed limit** where this would be safe and appropriate. And the Welsh Government should **assess what role bus franchising can play in different parts of Wales.**

A movement away from a deregulated bus market is already being pursued in Greater Manchester and the Liverpool City Region, and was raised in last year's white paper on bus services. Franchising allows both more universal coverage of public transport by providing routes that otherwise aren't provided by private operators and better integration with other modes of public transport. However, this will require subsidy to do so – indeed, it's hard to conceive Wales reaching its public transport and active travel target without a larger subsidy allocated to public transport than it has today. The size of the subsidy required will be influenced by the built form of a place – just because a bus route exists, it doesn't compel someone to get on it if the car remains the more attractive option.

This subsidy can be part funded by a number of revenue-raising policies. These include:

- **Congestion charging.** Given the concentration of jobs in Cardiff's centre and its higher level of congestion, this is likely to be far more appropriate there than elsewhere. Unlike the current model being discussed, this charge would be better targeted if it focused on the centre of Cardiff, as the congestion charge operates in London, rather than it being a charge for entering the Cardiff local authority area.
- **Workplace parking levies (WPL).** A WPL charges businesses for their parking spaces, and is already in use in Nottingham.
- **Tax devolution.** The Welsh Government should ask the UK Government for powers to raise fuel duty and use revenue to support public transport services.
- **Tax precepts and supplements.** Precepts on council tax and supplements on business rates (both of which have been used in London) are options to raise revenue locally, while the Welsh Government could use its powers around income tax to create a system similar to the French, where a local income tax contribution is a common way of funding transport networks.
- **Cross subsidisation from other parts of the network,** as the London Underground does for the London bus network. The South Wales Metro and the Cardiff Crossrail and Circle train-tram lines open up the possibility for this to happen in the Cardiff Capital Region, but this is not an option elsewhere.

Clearly, the size of the subsidy required will be the defining factor as to how appropriate this approach will be in different parts of Wales.

Where jobs are located and where people live influence both the demand and the sustainability of any public transport network. The Welsh Government should use both of these factors as the guiding principles that shape policy designed to boost public transport ridership in Wales.

Finally, this report does not pass specific comment on the clear ambition of the 45 per cent target. However, it is clear from this analysis that to meet it will require a set of bold interventions designed to both change the urban form of its cities and expand transport infrastructure, which would need to be met with substantial investment. Incremental change will not be enough.

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Introduction

City transport connectivity has become a prominent topic in the UK policy debate in recent years. Public transport has been seen as a lever to promote economic growth and reach net zero, and it was one of the main features of the UK Government’s Levelling Up White Paper. Seven English city regions have been allocated two rounds of funding (£15.4 billion for the 10 years to 2031) through the City Region Sustainable Transport Settlements. Furthermore, local and central governments have announced policy changes around the regulation (bus franchising in Greater Manchester) and pricing of buses (£2 fares).

Wales is no exception, and major transport policy announcements have been made in the last few years. South Wales Metro and the Cardiff Crossrail and Circle tram lines, an integrated transport system in the Cardiff Capital Region, is one of the largest transport infrastructure projects in the UK. And the Welsh Government has announced a set of policies, in addition to capital investments, to contain driving while aiming to increase public transport ridership. This includes a wide range of measures including the new 20-mph speed limit; stricter criteria for road building; and plans towards the regulation and integration of buses. At the local level, the Cardiff city council is discussing possibly introducing a congestion charge by 2027.¹

In March 2022, the Welsh Government published *‘One Network, One Timetable, One Ticket: Planning Buses as a Public Service for Wales’*, a White Paper that, among other things, set a target of 45 per cent of journeys done by public transport or active travel by 2040. To achieve that target, the paper aims to *‘design and deliver a bus network fit for the climate emergency, fit for the future and fit for the people of Wales’*. This though has come at a time when Welsh public transport is facing some serious issues. Buses are being cut due to the lower ridership levels and Transport for Wales (TfW) recently announced that pre-pandemic timetabling “just isn’t working”.²

¹ ‘Cardiff congestion charge: Everything we know about the plans’, South Wales Argus, 22 April 2023.

² See for example, Cardiff Bus announces massive timetable overhaul as key routes are cut, Wales Online, 8 August 2023; and Transport for Wales to shake up train timetables, BBC, 19 July 2023.

This report shows the different roles different parts of Wales will play in increasing public transport usage and the policies required to help make this happen. First, it highlights the benefits of connectivity towards economic and environmental goals. Second, it looks at how transport patterns in Wales and its cities have evolved over the last two decades. Then, it compares public transport accessibility and commuting patterns between Welsh cities and their peers, both in the UK and abroad, highlighting the reasons for the different outcomes between them. Finally, the report provides a deep dive into the connectivity of each Welsh city and presents case studies that may help guide transport policy at both the local and national levels.

Box 1: Methodology

Definition of a city

This paper will focus mainly on Cardiff, Newport, Swansea and Wrexham, which will all be referred to as ‘cities’. Unless otherwise stated, here cities refer to Primary Urban Areas (PUAs), using a measure of the built-up area of a large city or town, which spans beyond the core local authority for Newport, Swansea and other British cities used as peer comparators (Appendix 1). Wrexham, which usually falls outside of the PUA list due to its smaller size, is defined solely by Wrexham’s local authority.

For the 30 non-UK cities analysed (from France and Germany), Eurostat’s Urban Audit dataset has been used to provide the closest possible geography to PUAs. Urban Audit ‘cities and greater cities’ are defined based on population density rather than administrative borders, to avoid underbounding and overbounding issues. The cities under analysis were grouped according to whether their population was between 125,000 and 145,000 (Wrexham); between 240,000 and 300,000 (Newport and Swansea); and 350,000 and 550,000 (Cardiff). More information can be found in Appendix 1.

Data used for this research

This paper uses several public datasets. Public transport connectivity is from ONS ‘UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking’ and the Census 2021. Although connectivity is a broad concept, this report will focus on mobility to reach city centres, unless otherwise stated.

Commuting take-ups by mode of transport is from the Census 2011 and Eurostat; data relative to transport indicators at the national and regional level is from DfT and StatWales. One-to-one comparisons between Welsh cities and European peers use Google Travel API, a transport data provider.

The relevance of 2011 census data

In Wales, commuting data at the local level is only collected during the Census. The 2021 census was done in a period of high covid-related restrictions, and this has limited the insight it is able to provide.

Given this, commuting data at the city level in this report mostly uses previous censuses (2001 and 2011). Data at the Welsh level, shown in Figure 1, highlights that these numbers did not change much in the last decade.

A stable figure at the national level could hide significant changes across cities (e.g. an increase in public transport in one city being offset by a reduction in public transport in another). Evidence from cities in the UK and France, where data has been collected yearly, shows a stable composition of commuters by mode between 2011 and the year before the pandemic.³ This supports the assumption that the 2011 Census reflects a relatively accurate picture of Welsh cities before the pandemic.

Public transport ridership declined in 2020 and 2021 due to covid and hybrid working in most cities in the world, but it is not entirely clear that the composition of commuters (the share, not the total number) drastically changed from what it was prior to the pandemic. For example, the share of commuters using public transport in 2021 was slightly larger than that in 2019 for Greater Manchester, London and West Midlands.⁴

3 DfT's Usual method of travel to work by region of workplace for Greater Manchester; West Midlands Metropolitan County and London. Eurostat provides annual data between 2011 and 2019 for France and its cities. The share of public transport commuting in France remained stable around 16 per cent between 2011 and 2019. This hold for most of the French cities analysed in this paper (e.g. Nantes, Strasbourg, Dunkerque, Fort-de-France and others).

4 DfT, Modal comparisons (TSGB01). For further details see: <https://www.gov.uk/government/statistical-data-sets/tsgb01-modal-comparisons>.

02

Why public transport connectivity matters

Transport, both private and public, is critical urban infrastructure. It allows residents to access jobs, essential services, and leisure. A well-functioning transport network will contribute to sustainable economic growth in the following ways:

- **Promoting economic and productivity growth:** better connectivity boosts productivity by matching workers to jobs and jobs to workers (i.e. *agglomeration benefits*). A city needs a good transport system (private and public) to maximise the size of its labour market.
- **Increasing gains for workers:** a comprehensive transport network that increases the job pool available for workers will increase their ability to access different jobs and find a better match to their skills.

Public transport is particularly important to promote the benefits above in two situations. The first is when congestion reduces the flow of private vehicles. The second is when large shares of people do not own a car. One in five households do not own a car in Wales, and this is higher for the unemployed.⁵

In addition, public transport has benefits associated with the environment and health. A good quality public transport network takes cars off the road, reducing air pollution. Human-made air pollution contributes to 28,000-36,000 deaths every year in the UK; and costs billions of pounds for the NHS and social care.⁶ Furthermore, this impacts economic outcomes: air

⁵ Around 32 per cent of the residents unemployed in Wales do not own a car (Census 2021).

⁶ Between 2017 and 2025, total cost to the NHS and social care system of air pollutants (fine particulate matter and nitrogen dioxide) will be £1.6 billion.

Further details see: <https://www.gov.uk/government/publications/air-pollution-applying-all-our-health/air-pollution-applying-all-our-health#:~:text=The%20annual%20mortality%20of%20human,and%2036%2C000%20deaths%20every%20year>

pollution causes over six million sick days a year in the UK.⁷

The relative attractiveness of public and private transport is underpinned by how dense a place is. In rural areas, where people are spread out, providing frequent and fast public transport services that link these people to the destinations they want to go to is incredibly difficult. As an area becomes more densely populated, with more people living around any particular transport stop, this increases how accessible public transport is and the number of potential customers it can serve. For this reason, both public transport services and ridership are much higher in dense cities than they are in deep rural areas. And it means that the functioning of the public transport network takes on a greater significance in cities, even in a post-pandemic world (see Box 2).

Box 2: Hybrid work has not solved these problems: post-pandemic cities remain congested and have poor air quality

Evidence shows that post-pandemic patterns did not massively change in terms of congestion and air quality in UK cities. According to INRIX, the number of hours lost in congestion in 2022 was relatively close to the pre-pandemic level in most major British cities (with London already more congested than in 2019).⁸ In Cardiff – the most congested city in Wales – congestion levels were 30 per cent lower in 2022 than in 2019. This is a significant decline but the Welsh drivers still lost, on average, 60 hours a year due to congestion, one of the highest levels in the UK.⁹

Similar evidence is found in terms of air quality in Welsh cities. After a sharp improvement in air quality (PM2.5 concentration) in 2020 – driven by lockdowns and other pandemic-related restrictions – it has been deteriorating in the subsequent years.¹⁰

Therefore, providing good quality public transport (and reducing driving) remains important in a post-pandemic world where hybrid work has

7 Royal College of Physicians (2016), Every breath we take: the lifelong impact of air pollution. Report of a working party, London: RCP.

8 In London, congestion already 5 per cent above 2019 levels. In Birmingham, Manchester, Bristol and Nottingham congestion is 9-11 per cent below 2019 below.

9 According to INRIX, Cardiff ranked the 12th most congested city (in hours lost in congestion) in the UK. For further details see: <https://inrix.com/scorecard/#city-ranking-list>

10 According to IQAir, Wrexham levels of air quality in 2022 were like the ones seen in 2019. Swansea PM2.5 levels in 2021 were higher than in 2019. For the other cities analysed, PM2.5 levels remained below pre-pandemic in 2021 and 2022, but already significantly above 2020.

Cardiff PM2.5 levels: 11.5 in 2019; and 7.6 in 2020; 8.3 in 2021; 10.7 in 2022.

Newport PM2.5 levels: 11.5 in 2019; and 7.6 in 2020; 7.1 in 2021; 10.7 in 2022.

Swansea PM2.5 levels: 11.2 in 2019; and 8.3 in 2020; 11.7 in 2021; 10.5 in 2022.

Wrexham PM2.5 levels: 8.0 in 2019; and 7.7 in 2020; 8.1 in 2021; 7.9 in 2022.

become more popular.¹¹ At the same time, lower demand for public transport due to hybrid work put additional pressure on public transport's financial viability. This can lead either to fewer public transport services, which has further implications around air quality and carbon emissions, or to additional revenue support to maintain the existing network. Welsh policymakers need to consider these trade-offs in order to meet their policy targets around public transport use.

11 Between September 2020 and January 2023, 42 per cent of workers in Wales either worked fully remotely (19 per cent) or hybrid work (23 per cent). Moreover, workers (the UK level) at lower income levels are less likely to be able to work from home: more than 60 per cent of workers below £20,000 a year cannot work from home. For further details see: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/characteristicsofhomeworkersgreatbritain/september2022tojanuary2023>

03

Current patterns of public transport usage in Wales

A large part of trips made in the UK are non-work related. In 2019, commuting accounted for 14.9 per cent of all trips in England (no specific data is available for Wales).¹² Households move for shopping, leisure activities and to access essential services.

This paper will mostly focus on commuting for two main reasons. The first is data availability. Information on commuting flows is relatively easy to compare across places, both domestically and abroad. The second is the economic importance of these specific flows. Commuting is what connects workers to jobs and opportunities (labour market access and others previously discussed); and despite being a minority of trips, the nature of commuting flows (i.e. highly concentrated both in time periods and places) has specific impacts on congestion and air quality.

Driving is the single dominant mode of commuting in Wales and it is followed by walking

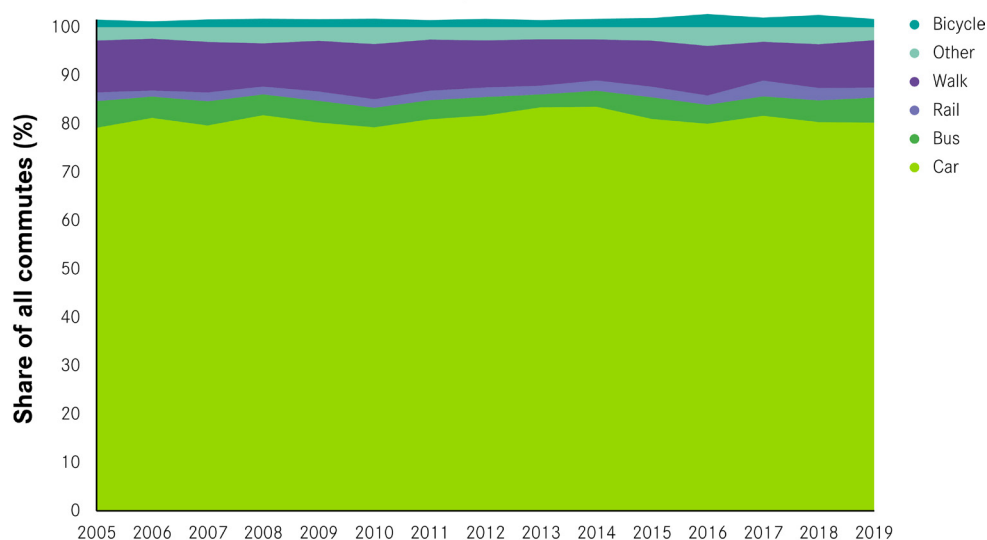
In Wales, most commutes are done by private vehicle with no sign of a reduction in recent years (see Figure 1). In the 15 years before covid, the share of workers commuting by car was broadly stable, accounting for around 80 per cent of all commutes (and data for 2020 and 2021 suggests these patterns did not change drastically as a result of covid¹³). Of the remaining commuters (a fifth of the total), most of them walk (around 60 per cent of all non-car commutes).

¹² DfT, Average number of trips by purpose and main mode.

¹³ According to the DfT, 82.6 per cent and 81.5 per cent of workers mainly commuted by car in 2020 and 2021, respectively.

Figure 1: Driving is the single dominant mode of transport in Wales with no signs of usage falling

Usual method of travel to work by region of workplace in Wales



Source: DfT (TSGB0109). Note: Data relative to 2020 and 2021 are not included because not all modes are included (Bicycle).

The figure above also shows that buses are the dominant mode of public transport. In 2019, buses accounted for just 5.2 per cent of all commutes, but this was roughly 7 in every 10 workers who usually commute by public transport.

These findings also suggest that the picture captured in the 2011 Census – which will be analysed at the city level in the next sections – seems to be an accurate description of the commuting flows in the years before the pandemic.

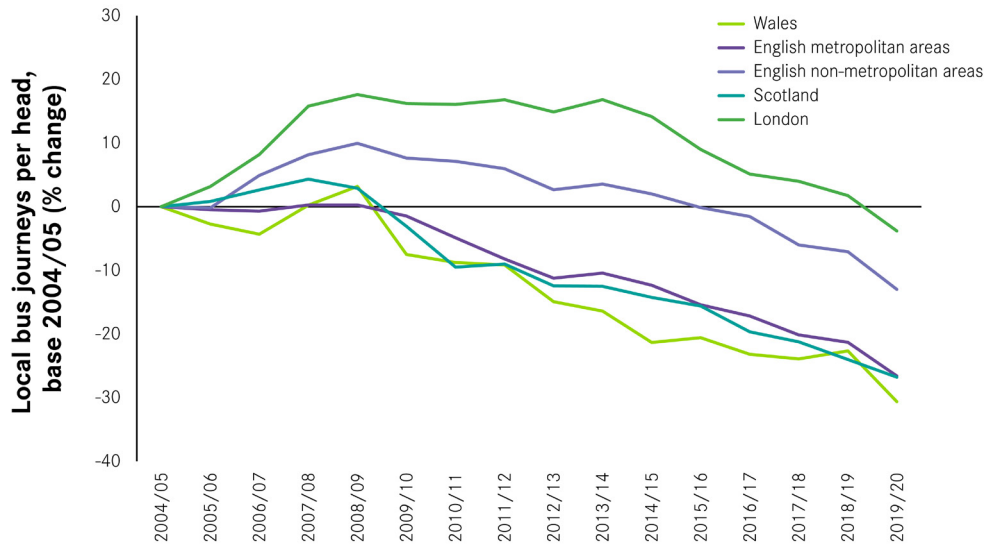
Public transport ridership has been declining and that is driven by buses

Since 2008, rail ridership has been increasing, but this has been dwarfed by the decline in bus use. Rail passengers rose by 4.3 million a year between 2008 and 2019, while the local bus passengers fell by 34.3 million a year in the same period.

The decline in local bus ridership started before 2008. Despite commuting patterns in Figure 1 suggesting a stable picture in terms of public transport commutes, bus ridership in Wales has been declining since 2004 at least (see Figure 2). It fell by 30.6 per cent between 2004/05 and 2019/20, a fall greater than all other comparator areas on the chart.

Figure 2: Bus ridership in Wales following the downward trend of Scotland and English Metropolitan areas

Passenger journeys per head of population, local buses

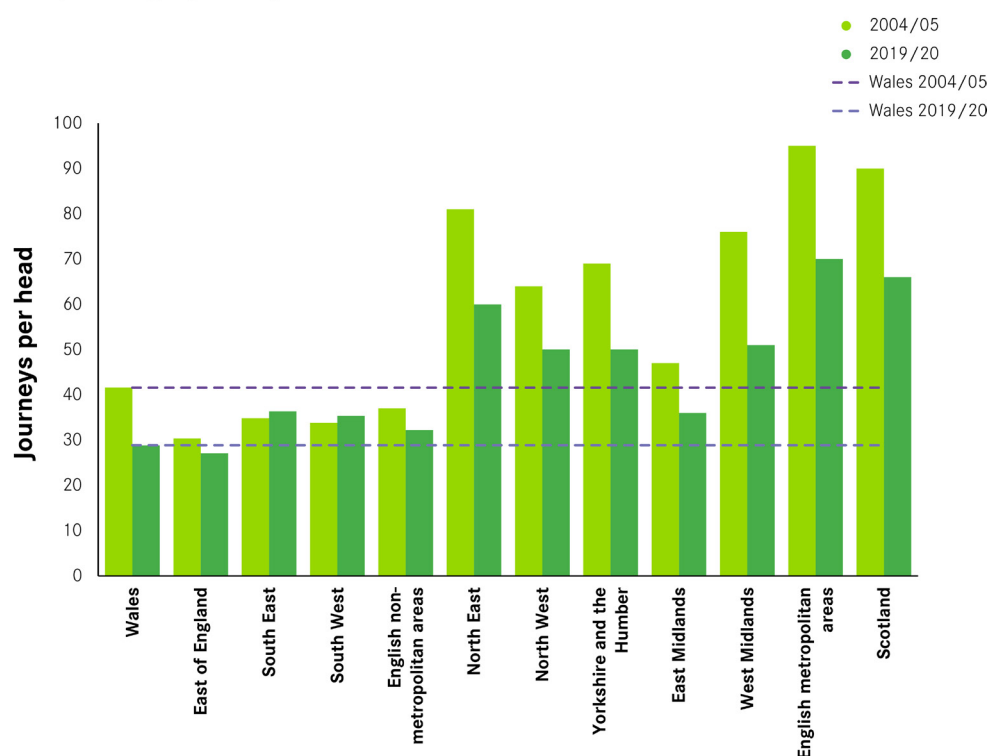


Source: DfT (BUS01b). Note: Differences between Wales and other areas in 2019/2020 (end March 2020) may be marginally explained by different covid-related restrictions.

As a result, Wales now has the second lowest levels of bus ridership per capita in the UK. After the sharp decline previously described, bus ridership per capita in Wales was ahead of the East of England only in 2019/20, with the South West and South East of England overtaking Wales in the fifteen years before the pandemic (see Figure 3).

Figure 3: Bus ridership per head in Wales has been surpassed by other nations and regions

Bus passenger journeys



Source: Dft (BUS01b). Note: Differences between Wales and other areas in 2019/2020 (end March 2020) may be marginally explained by different covid-related restrictions. London not included due to higher ridership per head which is above all other regions.

The ridership decline happened in a period of higher fares and lower services

There are several factors behind the decline of public transport use (driven by declines in local bus ridership) over such a long period. Previous Centre for Cities research shows that bus ridership in England (outside London) has been on a downward trajectory since the mid-80s, and it started around the time that buses were deregulated in 1986. Bus deregulation reduced the appetite for pro-bus policies (e.g. priority lanes or revenue support) and incentivised a model focused on competition between bus operators and modes of transport. This model often ended up creating local monopolies operating in the most profitable routes, while buses started competing with rail instead of complementing it.¹⁴

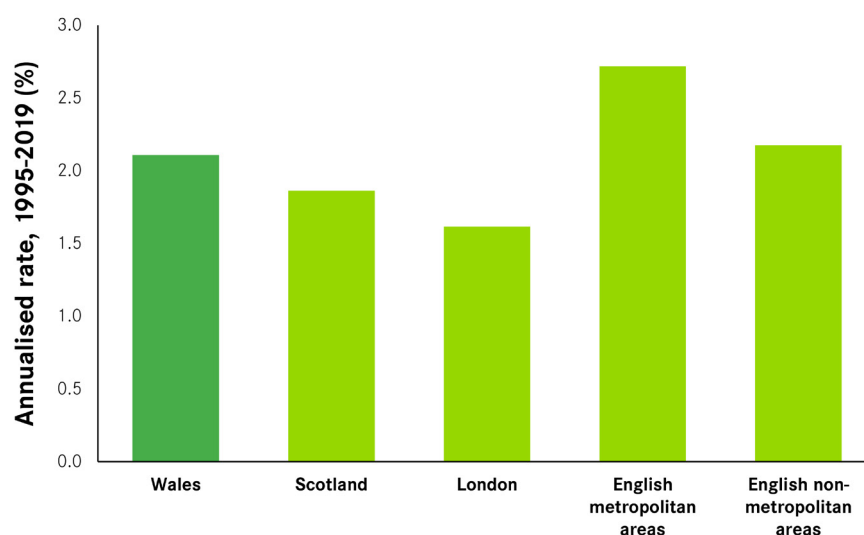
Despite some local authorities having their own bus operators, bus regulation is likely to have affected Wales negatively as well. Metrics around fares and the supply of services show the overall weakening of public transport in Wales.

14 Jeffrey S (2019) Delivering Change: Improving urban bus services, London: Centre for Cities

Taking fares first, while not as large as the rises seen in other areas of Britain, Wales saw a strong increase in bus fares since the mid-90s. As shown in Figure 4, bus prices rose 2.1 per cent a year above inflation (a cumulative increase of 65 per cent above inflation) between 1995 and 2019. Bus fare inflation in Wales was much higher than in Scotland and London, while it rose in line with non-metropolitan England. From a policy perspective, it's interesting to note that since 2010, fuel duty has been frozen while bus fares rose above inflation by 7.5 per cent in cumulative terms (2010-2019).

Figure 4: Bus fares rose above inflation at the same time as ridership declined

Local bus fares, real price increase



Source: DfT (BUS01b)

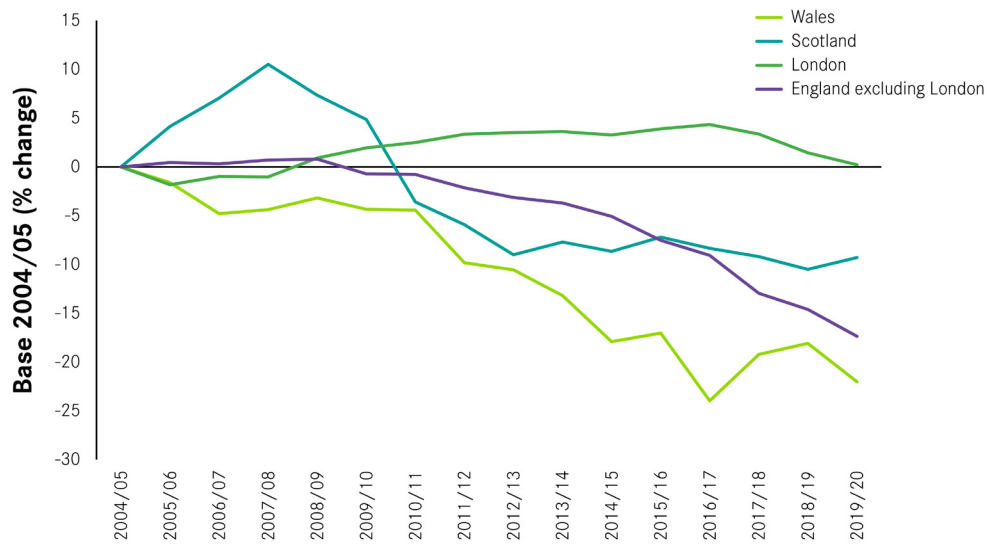
Fares do not seem to be the only explanatory factor behind the decline in bus ridership. English regions outside London also had high bus fare inflation (Figure 4 above) but faced a smaller decline in bus usage. Supply of services is another possible explanation for these differences.

Figure 5 shows that Wales was the nation in Great Britain where bus services, measured by the number of kilometres driven by buses, shrunk the most. The year before the pandemic, the number of kilometres driven by buses in Wales was around one-fifth lower than in 2004/05.¹⁵

¹⁵ This is due to numerous factors. Increased car ownership is a principal reason, which has led to increase in traffic congestion, resulting in a decrease in bus efficiency. Slower bus speeds have led to fewer passengers and higher fares, precipitating a spiral of decline. Increased operating costs due to higher fuel prices and driver pay have contributed to pressure on operators. Wider societal changes have also been attributed including increased online shopping and more flexible working. For further details, see: <https://mayerbrown.co.uk/keep-up-to-date/blog/posts/is-it-the-end-of-the-road-for-local-bus-services/>

Figure 5: Wales is the nation where bus supply declined the most in the last 15 years

Vehicle kilometres on local bus services by region



Source: DfT (BUS02b_km)

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How public transport use differs across Wales and why

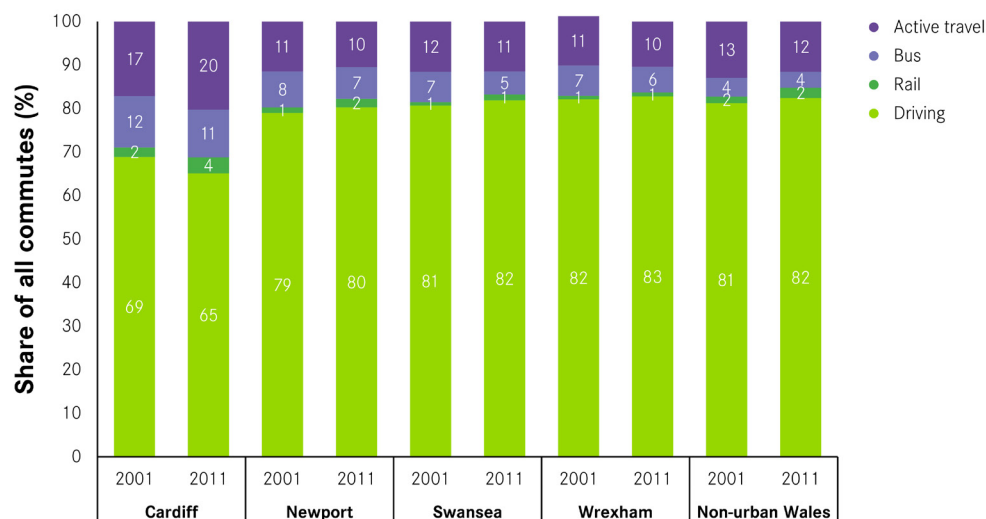
Public transport ridership varies greatly across Wales. These differences are seen both between urban and non-urban areas, and between different cities. This section compares the performance between different places and highlights the factors that drive those differences.

Commuting patterns mostly differ between Cardiff and the rest of Wales

The two censuses conducted before the pandemic (2001 and 2011, see Box 1 for further details of what they mean for 2023) show at least two features of commuting patterns in Welsh cities and non-urban areas. First, public transport commuting in Wales is similar between the regions of Wales with the exception of Cardiff. The capital is comparatively less reliant on private vehicles (noting they are still the main mode of transport). Within public transport, the role of rail is relatively minor outside the capital.

Figure 6: Driving accounts for four out of five commutes outside Cardiff

Commuting by mode



Source: ONS census 2001 and 2011. Note: Census 2021 was not taken into consideration as there is a significant number of people reporting working from home as the Census was run in early-2021, a period with several pandemic-related restrictions. The variation in commuting shares is subject to rounding issues.

Figure 6 shows that commuting patterns remained mostly unchanged between 2001 and 2011, except for Cardiff, where there was some substitution from driving to rail and active travel. In line with the findings from the previous section, the share of commuting by bus fell slightly.

The evidence is unclear whether driving has reduced in Wales since 2011

Although the 2021 Census (due to the pandemic) does not provide conclusive evidence of whether the share of commutes by driving in Cardiff continued to fall, other data sources suggest that this does not seem to be the case. The number of kilometres driven by cars and taxis – not necessarily commuting flows – kept rising everywhere, especially in Cardiff. In the capital, the number of kilometres driven increased by 19 per cent between 2011 and 2019 (Figure 7). One potential factor behind this increase is the emergence of ride-hailing apps in the Welsh capital since 2016, which frequently compete with all modes of transport.¹⁶ This is a reversal of the trend observed in the years before 2011, during which the number of kilometres driven on Cardiff's roads was falling while driving in other

¹⁶ There is evidence from several countries that this mode of transport competes with public transport under certain conditions.

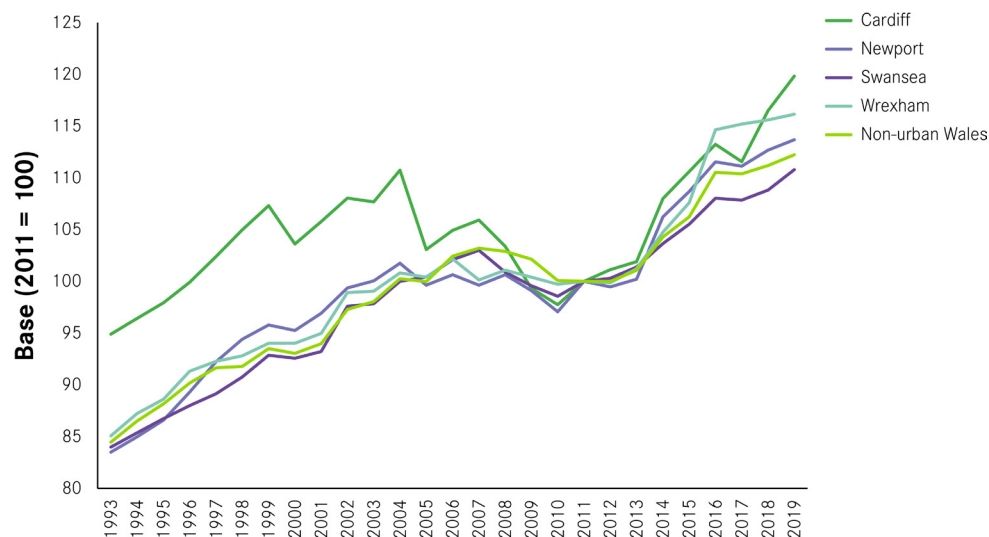
Qiao S and Yeh A (2023) Is ride-hailing competing or complementing public transport? A perspective from affordability, Transportation Research Part D: Transport and Environment

Flor M Ortuño A and Guirao B (2022), Ride-hailing services: Competition or complement to public transport to reduce accident rates. The case of Madrid

Welsh cities was rising.¹⁷

Figure 7: Driving in the Welsh Capital declined at the beginning of the 21st Century but it has increased significantly since 2011

Million kilometres driven by car and taxis



Source: DfT (TRA8905a)

However, the Ask Cardiff Survey suggests that commuting by car has been falling in Cardiff. By the end of the 2010s, it suggested that around 50 per cent of commutes were by car.¹⁸ It is not clear why there is a difference in the findings.

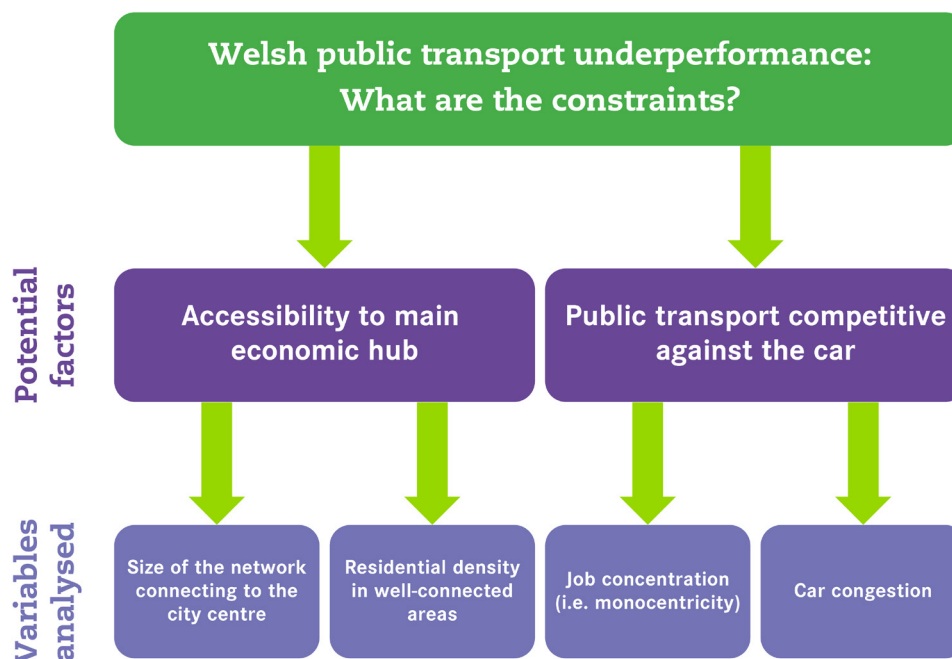
Public transport usage mainly depends on how competitive it is against driving

Analysing the main factors that make public transport attractive relative to other forms of transport helps explain these differences and what this means for public transport policy. Two main factors influence ridership (summarised in Figure 8):

¹⁷ Cardiff's Transport White Paper: Transport Vision to 2030, published in 2019, shows that the number of Cardiff's residents driving to work declined compared to 2010: from 57 per cent to 49 per cent. This does not necessarily mean that driving in Cardiff fell in the same period as 46.5 per cent of its workers live outside the Local Authority. This represents an upward trend as the number of non-resident workers in Cardiff was 37.5 per cent in 2001 and 41.2 per cent.

For further details see: <https://www.cardiff.gov.uk/ENG/resident/Parking-roads-and-travel/transport-policies-plans/transport-white-paper/Documents/White%20Paper%20for%20Cardiff%20Transport%202019.pdf> and <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/travelto-work-estimates-using-assumed-pre-coronavirus-travel-behaviours>

¹⁸ Analysis from the Ask Cardiff/Annual Transport Survey provided by Cardiff City Council

Figure 8: Public transport performance evaluation model

Source: Centre for Cities

1. **'Public transport accessibility' (see Box 3 for methodological details) to the main economic centre for each city:** this is a function of a) the network size at peak times and b) the people living within those areas (residential density).
2. **Relative competitiveness of public transport compared to driving:** this is a function of a) job concentration in the main economic centres (i.e. polycentric vs. monocentric patterns of jobs) where public transport is easier to plan and operate in monocentric economies and b) the relative cost of public transport against the car, both financially (the price of each mode) and in terms of time taken (road congestion and frequency and reliability of public transport).

What follows uses this model to assess the determinants of public transport accessibility in Welsh cities relative to UK and European peers, which have been chosen based on their similarities in population, industrial structure and topography. There are other relevant variables, such as public transport frequencies, speeds and fares, which will not be directly measured due to data limitations.

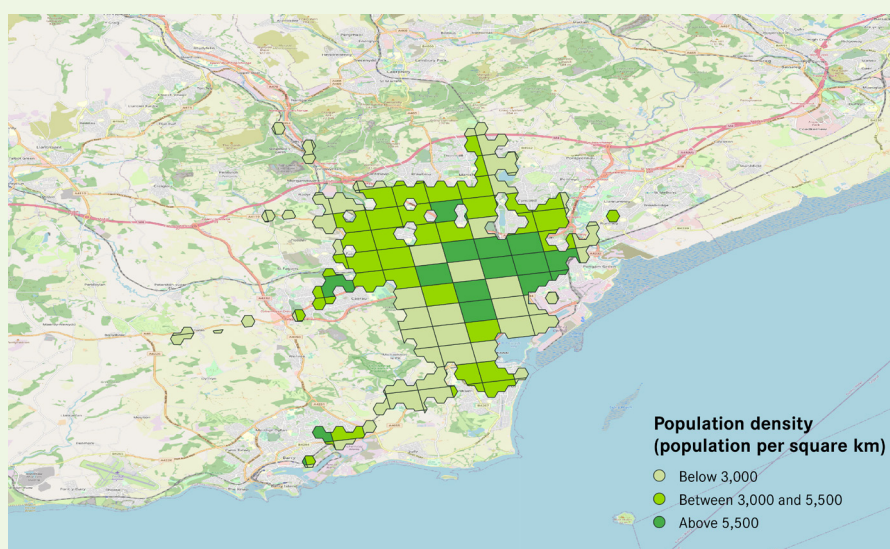
Box 3: Public transport accessibility methodology, visualisation, and its relevance across different areas

Among other things, public transport connects workers to jobs. ‘Public transport accessibility’ (or ‘effective workers’) will be measured by the share (or the number of workers) that can reach the main economic hub of each city in 30 minutes.¹⁹

The factors driving ‘public transport accessibility’

As previously mentioned, accessibility is a function of the size of the network (i.e. the size of the highlighted area in Figure 9) and how many workers live within the area that is best connected to a city’s main economic hub (i.e. population density, with darker areas representing higher density).

Figure 9: Cardiff’s 30-minute accessibility to its city centre (Cardiff Central) by Output Area, 2021



Source: Google Travel API, Eurostat, OpenStreetMap.

Public transport accessibility alone does not capture the geography of each specific labour market

High levels of public transport accessibility defined above only reflect good labour market connectedness if there are a significant number of jobs in the main economic hub of a city. The same public transport accessibility score is more meaningful for a more monocentric labour market when compared to a polycentric one. This feature is particularly important in a deregulated

¹⁹ The average commuting time in Wales in 2019 was 27 minutes (DfT). Data from English regions suggests that commuting times tend to longer in urban areas.

For further details see: <https://www.gov.uk/government/statistical-data-sets/tsgb01-modal-comparisons#travel-to-work>

transport market, like the bus network, as the network focuses only on running profitable services.²⁰

In this section, public transport accessibility is measured at a single employment point for each city, the one with the highest concentration of jobs (see Table 1).

Table 1: The main economic hubs of Welsh cities

City	LSOA	Area description	Number of Jobs, 2021	Share of all jobs, 2021 (%)	Share of all land (%)	Job density (job per hectare)
Cardiff	032G	Around Cardiff	15,000	7.0	0.2	590
		Central Cardiff				
Newport	014B	Next to Newport	4,000	4.0	0.1	122
		Station				
Swansea	025F	Next to Swansea	8,000	5.0	0.1	116
		Station				
Wrexham	011B	Next to Wrexham	9,000	15.0	0.1	123
		Station				

Source: ONS; BRES

More information on the geography of jobs in each city, the type of jobs, and their respective connectivity can be found in the last section of the paper.

Public transport accessibility is lower in Welsh cities but its factors seem to vary

Factor 1: Public transport accessibility: network size and residential density

Public transport accessibility (which is a function of the size of the network and residential density as explained in Box 3) to their main economic hub is mostly lower in Welsh cities than in their better-performing peers (the selected peers are detailed in Table 8.) For example, Figure 10 shows that 41.7 per cent of

²⁰ Jeffrey S (2019), Delivering Change: Improving urban bus services, London: Centre for Cities

Cardiff workers can access its main economic centre in 30 minutes by public transport, compared to between 57.2 per cent (Edinburgh) and 81.9 per cent (Brighton).²¹ This underperformance holds across the other Welsh cities too. The share of workers within 30 minutes of the main transport hub is lower in Newport and Swansea than in Sunderland, Plymouth or Hull, while Wrexham, is the best performing Welsh city, it trails Gloucester.

Figure 10: Welsh cities underperform in terms of public transport accessibility to their main economic hubs

Public transport accessibility



Source: ONS (UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking) and Census 2021 (Scottish cities, Census 2011). For further details on the peer cities selected see Table 8.

As Figure 8 sets out, this is a function of two factors: the size of the network and the density of residential development.

Factor 1A: Network size

The size of the public transport network seems to be a constraint for Cardiff and Swansea, which have public transport networks smaller than most of their peers. Reading's catchment area in 30 minutes by public transport is almost twice Cardiff's size. And Sunderland (which includes parts of Tyne & Wear Metro) and Hull (which does not have a mass transit system) outperform Swansea.

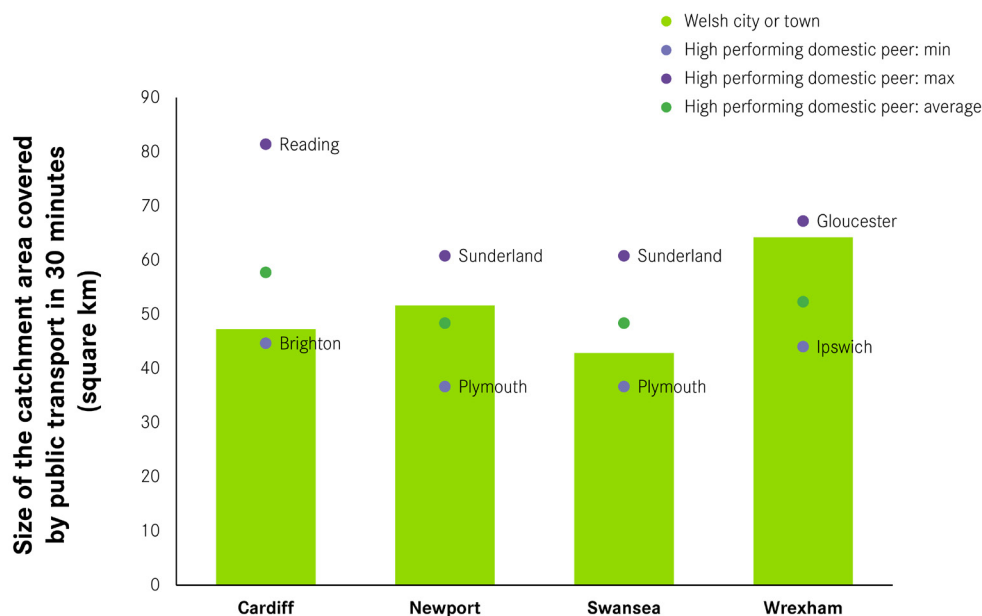
In contrast, Newport and Wrexham's public transport networks (measured as their areas covered within 30 minutes) are not smaller than most comparable to their peers, despite their broader poor accessibility performance previously shown. Wrexham's network is almost as large as Gloucester, while Newport only

²¹ Previous Centre for Cities research has focused on the number of residents that can access on access city centres.

underperforms Sunderland.

Figure 11: Network size is an issue in Cardiff and Swansea

Public transport network size



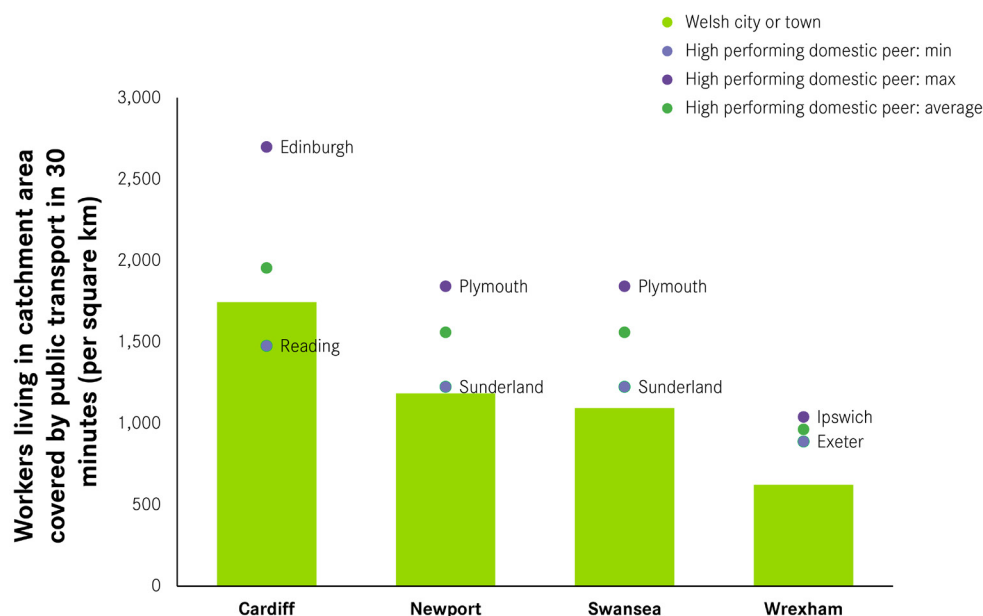
Source: ONS (UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking) and Census 2021 (Scottish cities, Census 2011). For further details on the peer cities selected see Table 8.

Factor 1B: Residential density in well-connected areas

Instead, the challenge for Wrexham and Newport in particular (as well as Swansea) is that they do not have large shares of their populations living in this network catchment area. Figure 12 below shows that lack of residential density in well-connected areas is a common feature of Welsh cities when compared to their respective peers. Cardiff is the best performer on this measure but all perform poorly relative to their comparators. In contrast, Brighton’s relatively small public transport network (as shown in Figure 12) is partially compensated by having a lot of residents living within the best-connected areas of the city (Brighton has 2,641 workers per km² compared to 1,724 workers per km² in Cardiff).

Figure 12: Residential density of workers is one driver behind Welsh lower levels of public transport accessibility

Residential density in best-connected areas



Source: ONS (UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking) and Census 2021 (Scottish cities, Census 2011). For further details on the peer cities selected see Table 8.

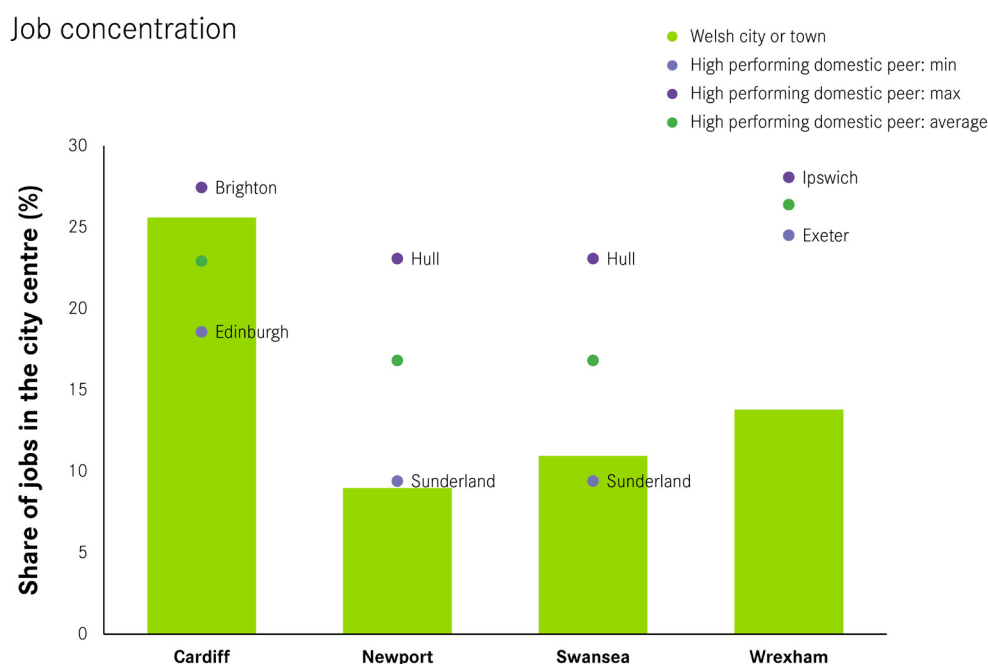
Factor 2: Public transport competitiveness compared to the car – job concentration and car congestion

The structure of the economy and the influence of this structure on job location also affect the viability and performance of public transport. Outside of Cardiff, both the concentration of jobs in urban centres and the congestion in the cities is comparatively low.

Factor 2A: Job concentration and industrial structure

Cardiff has a much greater share of its jobs located in the centre than other Welsh cities (Figure 13). This means that many more commutes finish in the same place, creating congestion and making commuting by public transport relatively more attractive and commuting by private transport more difficult.

Figure 13: City centre job concentration (monocentric) is relatively low in Welsh cities, except for Cardiff



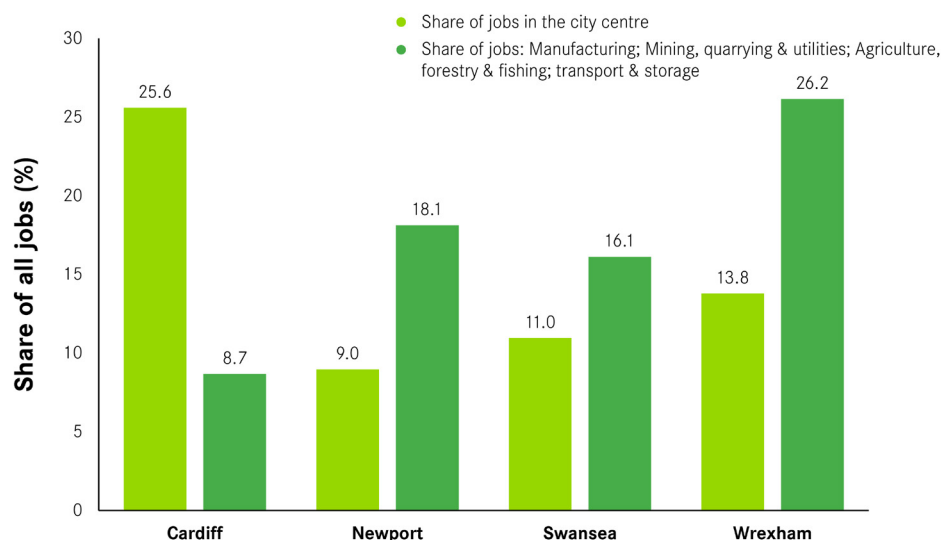
Source: ONS, BRES. City centres are defined based on all the LSOAs within 0.5 miles from the pre-determined city centre point. Wrexham city centre is considered the central LSOA (Wrexham 011B). For further details on the peer cities selected see Table 8.

Cardiff’s share of jobs in its centre compares favourably with its peers, but this is not the case for the other cities. This dispersion of jobs results from their relatively high share of jobs in the non-service economy, in sectors like manufacturing, mining, and storage, that require large and relatively cheap space or locations close to natural assets (see Figure 14). In contrast, Cardiff’s economy has a high concentration of knowledge-intensive exporting services (e.g. media, marketing, design) which have shown an increasing preference for city centre locations in recent decades.²²

22 McDonald R (2019), City centres: Past, present and future, London: Centre for Cities

Figure 14: Industrial composition and centrality vary across Welsh cities, with Cardiff being an outlier

Job concentration and industrial structure



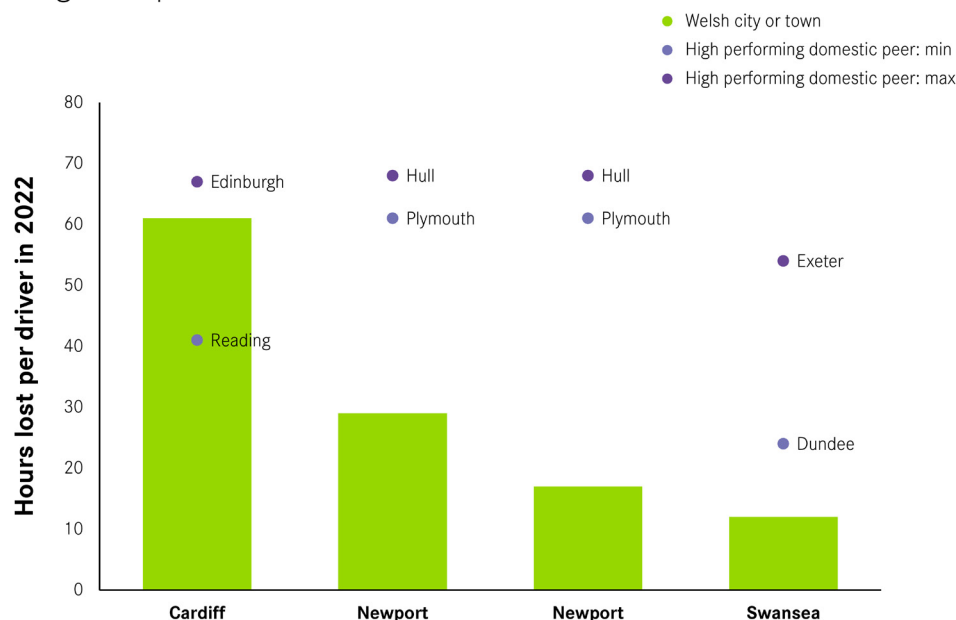
Source: ONS, BRES. City centres are defined based on all the LSOAs within 0.5 miles of the pre-determined city centre point. Wrexham city centre is considered the central LSOA (Wrexham 011B).

Factor 2B: Car congestion

Higher job concentration creates car congestion at peak times. Provided this congestion does not affect public transport (e.g. through bus lanes), this makes public transport comparatively more attractive. Congestion data from INRIX support this hypothesis: Cardiff is the only Welsh city where congestion is on a par with peer cities. Swansea, Newport and Wrexham have much smaller congestion problems than both Cardiff and their peers (Figure 15).

Figure 15: Congestion is comparatively low in Welsh cities except Cardiff, making driving more attractive

Congestion per driver



Source: ONS, BRES. City centre defined City centres are defined based on all the LSOAs within 0.5 miles from the pre-determined city centre point. Wrexham city centre is considered the central LSOA (Wrexham 011B). For further details on the peer cities selected see Table 8.

Summary: Cardiff's underperformance drivers differ from those in the remaining Welsh cities

Welsh cities trail their peers in terms of public transport accessibility. The reasons behind this differ between each city. Cardiff's underperformance seems to be explained by a combination of a relatively small public transport network with lower density in the best-connected areas of the city. Policies designed to boost public transport ridership should focus on expanding the public transport network – connecting more areas to central Cardiff – and densifying well-connected neighbourhoods.

Improving public transport accessibility to the centres of the other cities would naturally increase commutes done by public transport. But their economic structure and job concentration will likely limit the increases in ridership as the car continues to hold the edge. This means that a different approach to boosting public transport ridership will be required – one that reflects the lower density nature of both its residents and its jobs. Table 2 summaries these findings.

Table 2: Factors that are constraining different cities and policy implications

City	Public transport network size	Residential density	Job concentration in central areas	Easy to drive (relative attractiveness of driving)	Summary
Cardiff	Seems to be a constraint	Seems to be a constraint	Does not seem to be a constraint	Does not seem to be a constraint	Does not have Reading's network, nor Brighton/Edinburgh densities. Improving both the network and density is likely to increase public transport outcomes. City centre job density and car congestion suggest there is demand for those improvements.
Newport	Does not seem to be a constraint	Seems to be a constraint	Seems to be a constraint	Seems to be a constraint	Improving the public transport accessibility towards the city centre – either by new infrastructure or densification – may bring some gains but they seem to be limited. A public transport model, even with densification, which does not tackle its polycentric nature is unlikely to succeed.
Swansea	Seems to be a constraint	Seems to be a constraint	Seems to be a constraint	Seems to be a constraint	
Wrexham	Does not seem to be a constraint	Seems to be a constraint	Seems to be a constraint	Seems to be a constraint	

Source: Centre for Cities.

The next section analyses each city in more detail and sets out successful policies from elsewhere that can help shape their respective public transport systems.

05

Cities Deep Dives

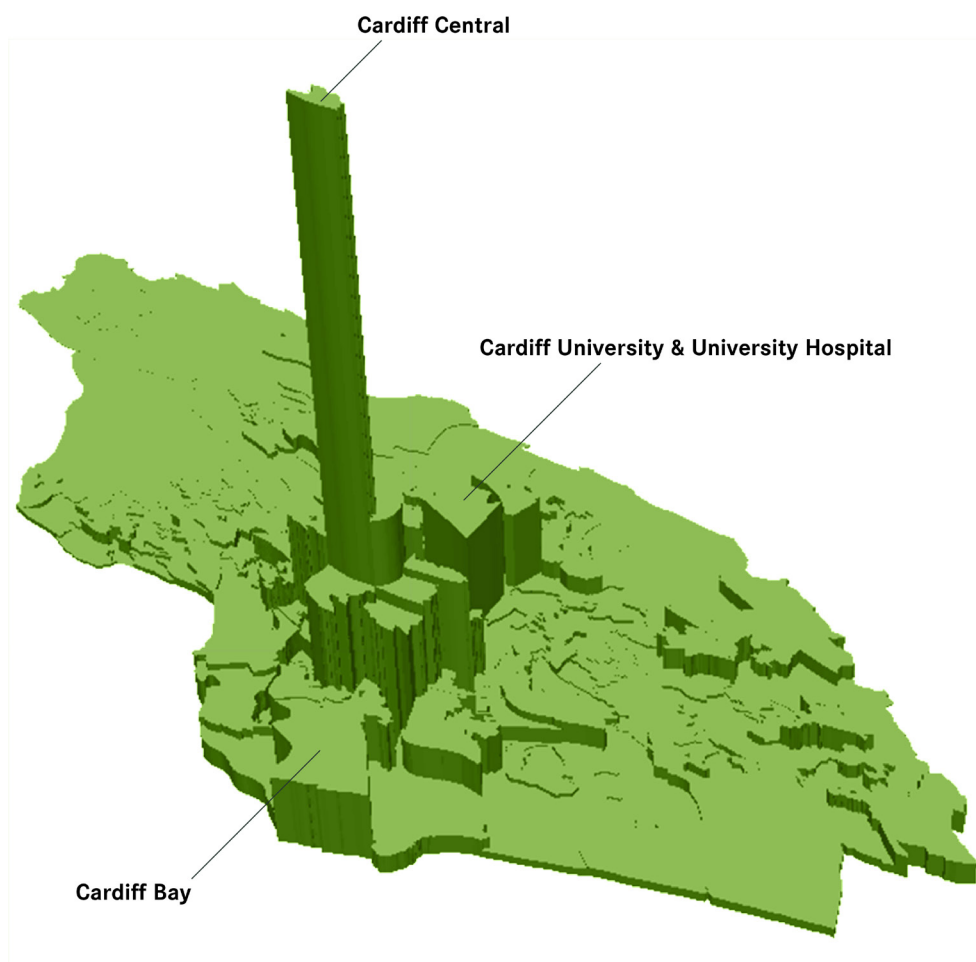
This section looks at each city in more detail, looking at accessibility to the three main jobs sites in each and providing a case study on its accessibility relative to a European peer.

Cardiff

Job concentration and location of economic hubs

Cardiff has a relatively concentrated job market, as shown in previous sections (see Figure 16). The three main job centres in Cardiff are the areas that include (among others) Cardiff Central and Queen Street; the University Hospital of Wales; and Cardiff Bay and the Senedd. These areas are relatively close to one another and account for around one-third of all jobs.

Figure 16: The distribution of jobs in Cardiff is relatively concentrated, job density by LSOA, 2021



Source: ONS, BRES.

The city's jobs and economic output have increasingly clustered in its city centre in recent years (it accounted for 20.6 per cent of output in 2000 but 24.8 per cent in 2019). Having jobs concentrate in city centres does not just make providing public transport easier, but it is important for the development of the economy too. In recent decades, high-skilled, knowledge-based activities have increasingly located in city centres because of the benefits that a city centre brings.²³ This has meant that on average city centres are the most productive parts of the UK economy.²⁴ The challenge for Cardiff is that its city centre productivity lags behind other successful cities.²⁵ To encourage both economic growth and an increase in public transport ridership, Wales will need to build on the growth seen around Cardiff Central in recent years so that Cardiff city centre makes a larger contribution to the performance of Cardiff and the wider Wales economy more generally.

²³ McDonald R (2019), *City centres: Part, present and future*, London: Centre for Cities

²⁴ Swinney P (2021), *So you want to level up?* London: Centre for Cities

²⁵ McDonald R (2019), *City centres: Part, present and future*, London: Centre for Cities

Public transport accessibility

Public transport connectivity differs across these three main job hubs. The best-connected hub is the one around Cardiff Central, where 41.7 per cent of all workers in Cardiff can reach it in 30 minutes by public transport. This contrasts with the 24 per cent of all workers that can access the area around the University Hospital.

Around half of Cardiff's workers can access at least one of the three main economic centres in Cardiff in 30 minutes by public transport. That said, the capital has a relatively low level of public transport accessibility for multiple hubs ('deep accessibility'). Only 24 per cent of the workers can access both Cardiff Central and Cardiff Bay in 30 minutes by public transport, and this falls to 4 per cent when including the University Hospital. This raises questions about the level of provision within the existing network, and whether the city would benefit from a system that had more comprehensive coverage.

Table 3: Cardiff public transport connectivity in 30 minutes

Areas	Share of all workers that can access by public transport in 30 minutes (%)	Total number of jobs	Share of all jobs (%)	Exporting jobs and knowledge-intensive local services (%)		
				Other local service jobs (%)	Publicly funded jobs (%)	
Cardiff Central	41.7	45,175	21.4	38.8	34.5	26.8
Cardiff Bay	31.1	17,165	8.1	47.9	22.4	29.7
University Hospital	23.7	11,750	5.6	1.1	1.3	97.6
At least one of the points above	50.7	74,090	35.2	34.9	26.4	38.7
All the points above	4.0	-	-	-	-	-

Source: ONS (UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking), Census 2021 for public transport accessibility; and BRES. Cardiff Central and Queen Street (Cardiff 032G and Cardiff 032F), the University Hospital of Wales (Cardiff 018B) and Cardiff Bay and the Senedd (Cardiff 048B and Cardiff 048B).

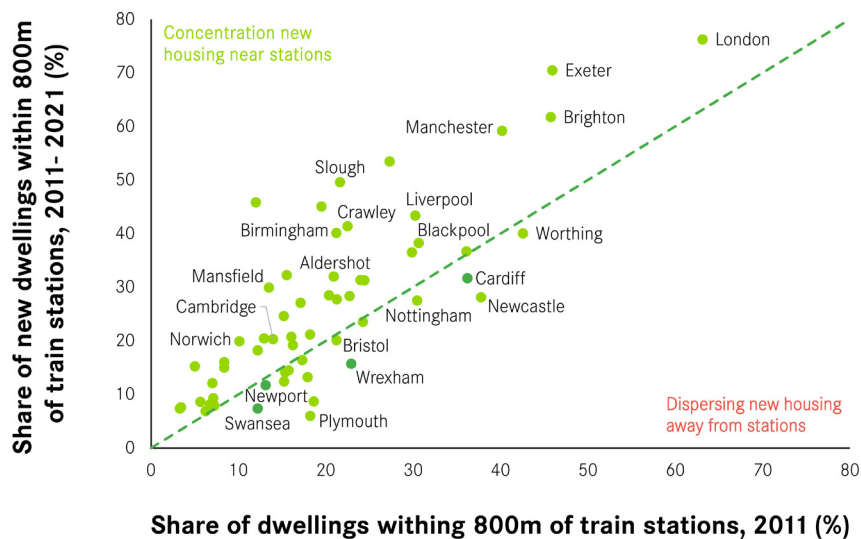
Cardiff's residential density

Cardiff, like most British cities, lacks a mid-rise built form and apartment living when compared to European cities.²⁶ There may be historical factors behind those differences, but the built-up form of a city is not static. Comparing Cardiff with Nantes (as is done in Case Study 1) shows that between 2006 and 2018, 59.4 per cent of the overall population growth in Cardiff occurred in the best-connected areas (30 minutes by public transport), compared with 77.3 per cent in Nantes. This difference shows that historical legacies are not the sole reason why Cardiff is not as dense as the French city.

Even within the UK context, Cardiff has not developed much around its train stations. As illustrated in Figure 17, the housing stock has been dispersing away from these nodes of transport in recent years: 36.2 per cent of dwellings in 2011 were within 800m of rail stations – one of the highest in the UK – but in the last decade these areas accounted for 31.7 per cent of new dwellings. Unlike Cardiff, cities like Exeter, Brighton and Liverpool had their housing stock concentrate more around rail.

Figure 17: Despite having a higher share of dwellings around rail stations, Cardiff's recent development has been dispersing away from them

Public transport accessibility



Source: Census 2011 and Census 2021. Centre for Cities calculations.

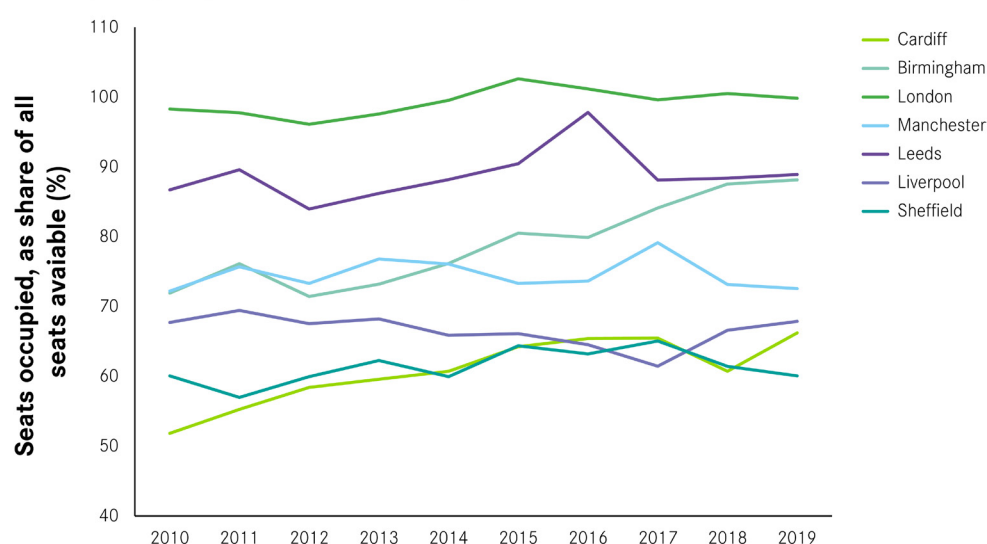
Rail capacity suggests that densification is an effective strategy for Cardiff. At peak times, trains have on average more seats than users, suggesting that there is capacity in existing trains to accommodate extra commuters from

²⁶ Rodrigues G Breach A and Evans J (2021) Measuring Up: Comparing public transport in the UK and Europe's biggest cities, London: Centre for Cities

densification. Figure 18 shows that in the five years before the pandemic, the average number of available seats occupied at peak hours (arrivals and departures) was around 65 per cent – an average of around 8,000 available seats. The passenger-seat ratio is similar in Liverpool and Sheffield but much lower than in the largest urban areas in the UK such as London, Manchester, Birmingham and Leeds. Data on late-running trains, a proxy for rail congestion, shows this indicator is also not particularly high, suggesting further that the existing infrastructure can absorb extra commuting passengers.

Figure 18: Pre-pandemic rail use at peak times suggests that the network can absorb further densification

Rail capacity at peak times in the city centre



Source: DfT (RAI0201), 'City centre peak am (07:00-09:59) by rail on a typical autumn weekday, by city: 2010-2019'. Notes: Data at peak pm shows similar findings. A share below 100 per cent does not mean that all services have fewer passengers than seats available.

Policy can shape housing outcomes around the best-connected areas of a city, and there are some good examples around the world that can serve as inspiration. In the early 90s, the French city of Lille used new public transport connections (Eurostar and TGV Nord Line) to promote urban regeneration and aimed for an explicit policy of inner-city densification, establishing an ambition that two-thirds of new housing needed to be within Lille's build-up area.²⁷ The city also launched a strategy of minimum density requirements within 500m of tram stations. Meanwhile, Bordeaux launched the '50,000 Housing' project in 2010 to develop homes along existing transport links.²⁸ Finally, Auckland, the largest city in New Zealand (a country with a similar built-up form and that used to have a similar planning system) changed its zoning requirements in 2016, leading to an

²⁷ Frick S Taylor I Prenzel P Penney K Collier P Goodstadt Mayer c and McCann P (2023) Lessons from successful 'turnaround' cities for the UK, London: The Economy 2030 Inquiry

²⁸ JLL with support from Mott MacDonald (2021), City Region Connectivity: The role of transport infrastructure in driving regeneration and levelling up (2021), commissioned by London Property Alliance and Sheffield Property Association

increase in densification in inner suburbs.²⁹

Congestion charging in Cardiff: welcome but should target its central area instead of being a boundary charge

One of the reasons why public transport improvements in Cardiff are necessary is the high levels of car congestion. The number of hours lost to congestion makes the city poorer, leaves workers with less time for housework and leisure, and makes air quality worse.

Cardiff is one of the cities in the UK most affected by high levels of congestion.³⁰ According to INRIX, if Cardiff were an American city, it would have the 14th highest number of hours lost to congestion in 2022, ahead of Denver, Dallas or Seattle. And it would rank third on this scale Germany.³¹ This is estimated to cost £540 per driver in 2022 alone, or a total cost of millions to the city each year.

Public transport improvements may not be enough to reduce congestion alone. Research on this topic is mixed.³² As a result, the congestion charge being discussed is a step in the right direction.

London and other cities around the world show that this policy has been an effective way of reducing congestion, improving air quality, and even making public transport faster in the most congested areas (fewer congestion-related delays).³³

Moreover, the charge boosted Transport for London's revenues, which were used to fund its public transport network.³⁴ For example, on the day the congestion charge was implemented in the UK capital, 300 new buses (out of a total of around 8,000) were introduced in the network.³⁵

The congestion charge being discussed in Cardiff is likely to be a £2 payment to each car entering the local authority. This policy will disincentivise driving towards Cardiff from non-residents, but will likely have much less impact on the driving behaviour of Cardiff's residents.

An alternative would be charging a smaller area of the city where congestion is higher, the same way London, Milan and Stockholm operate. Centre for Cities

29 Greenaway-McGrevy R and Phillips P (2021) The Impact of Upzoning on Housing Construction in Auckland, Centre for Applied Research in Economics, Working Paper No. 009

30 Stansbury A Turner D and Balls E (2023) Tackling the UK's regional economic inequality: Binding constraints and avenues for policy intervention, Harvard Kennedy School

31 Pishue B (2023) 2022 INRIX Global Traffic Scorecard

32 Two examples of these are:

Anderson M (2003) Subways, Strikes and Slowdowns: The Impact of Public Transit on Traffic Congestion, NBER Working Papers

Bento A Cropper M Mobarak A and Vinha K (2003) The Impact of Urban Spatial Structure on Travel Demand in the United States, World Bank

33 Asian Development Bank and Deutsche GIZ (2015), Introduction to Congestion Charging – A Guide for Practitioners in Developing Cities

34 Asian Development Bank and Deutsche GIZ (2015), Introduction to Congestion Charging – A Guide for Practitioners in Developing Cities

35 'First congestion fines to go out', BBC, 18 February 2003

estimates suggest that it would be possible to raise a similar revenue (around £25 million gross revenue) with a £3 congestion charge applied to a much smaller part of Cardiff that includes the city centre, Cardiff Bay, and surrounding areas.³⁶ Those are the areas with the highest job density (around 12.9 per cent of its land area and 55.4 per cent of all jobs), and so are the ones more likely to suffer from car congestion and poorer air quality.

Cities in France have applied a different approach, using the Versement Transport as a way to raise revenue. This creates revenue raised from a broad tax base, but it doesn't directly encourage a reduction in private transport (see Box 4).

Case Study 1: Cardiff vs. Nantes – ongoing public transport investment is welcome, but Wales needs to make the most out of it

The low level of public transport accessibility to multiple job centres shown above, combined with car congestion, highlights the importance of improving intra-city public transport better in the Welsh capital. Comparing Cardiff with Nantes, a similar-sized but more productive city, supports this idea.

The public transport system in Nantes can connect around 319,000 residents to its city centre in peak time (72 per cent of all residents), which is 40 per cent more people than in Cardiff (223,000 residents or 50.4 per cent of all residents).³⁷ The size of the public transport network is one of the reasons behind those differences. Among other factors, Nantes has had a tram system since 1985 that has been expanding (see Box 4 for further details). In a three-kilometre radius from their respective central stations, Cardiff has 283 bus stops and 6 rail stops, whereas the French city has 426 bus stops and 74 stations.³⁸ As a result, the area covered by public transport in 30 minutes is 20 per cent larger (12 square km) than in Cardiff.³⁹

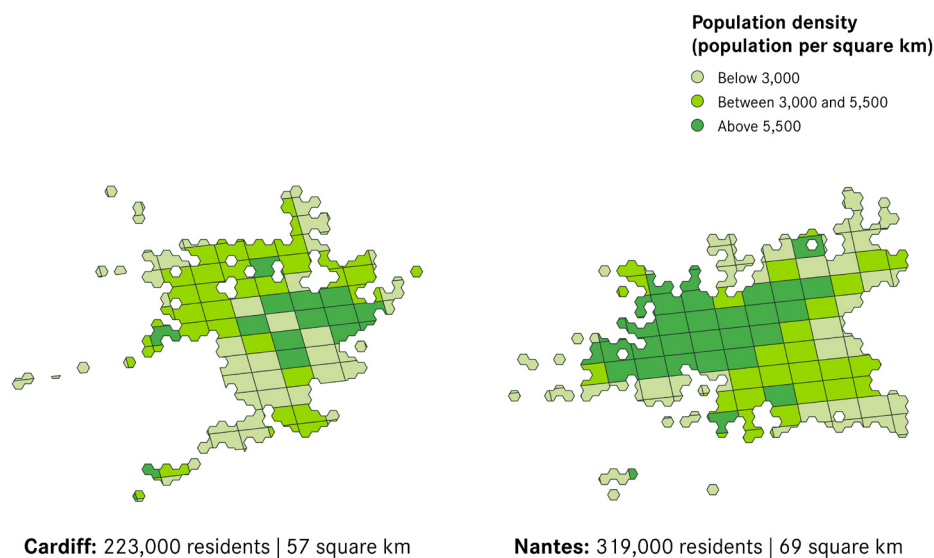
³⁶ This would include the following MSOA: Cardiff 032, Cardiff 033, Cardiff 034, Cardiff 036, Cardiff 038, Cardiff 042, Cardiff 044, Cardiff 046, Cardiff 048 and Cardiff 049

³⁷ Public transport connectivity from Google Direction API, a private data provider, recorded in the first half of 2023. Population estimates from Eurostat grid (2018). These findings may have some disparities with other public transport outcomes of this report as they use different time periods and data sources.

³⁸ Source: tomforth.co.uk. For further details see: <https://www.tomforth.co.uk/circlepopulations/>

³⁹ Cardiff underperformance both in terms of public transport accessibility and network size holds for other time thresholds like 45 minutes.

Figure 19: Nantes' public transport network is larger and connects more residents to its central areas at peak time



Source: Google Direction API and Eurostat. The area that can reach the city centre in 30 minutes by public transport in peak time. Note: To make it internationally comparable, these maps use a different data source for Cardiff than the rest of the report. This may explain any data differences. These estimates do not account for different levels of frequency and quality of the service.

The ongoing South Wales Metro, Cardiff Crossrail and Circle train-tram lines are a step to close this gap. The project will improve existing infrastructure, integrate different modes of public transport, and expand the network in Cardiff and surrounding local authorities that are part of the Cardiff Capital Region.

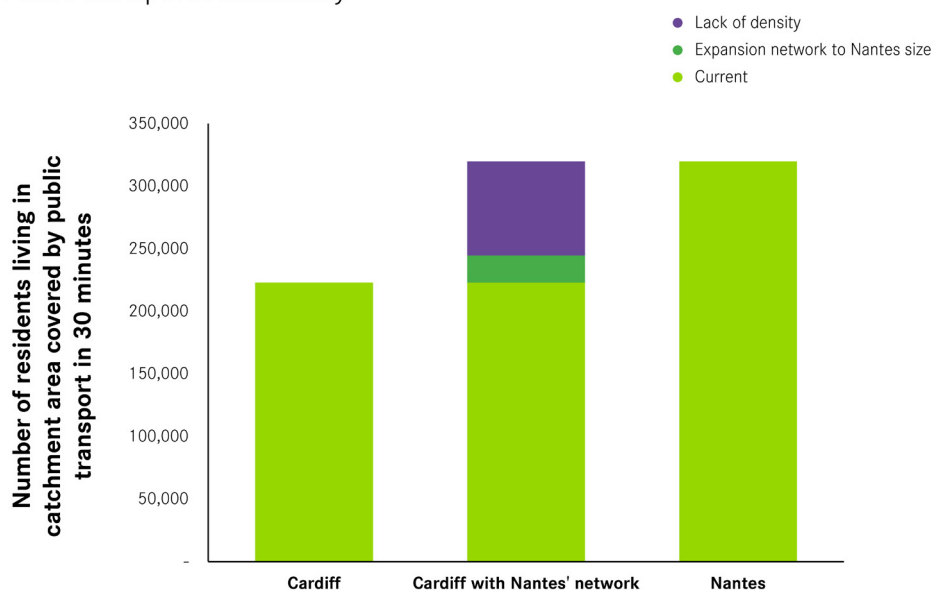
Expanding the size of the public transport network though is unlikely to be enough to fully close the gap between the Welsh capital and Nantes. Figure 20 shows that a similar-sized network (30 minutes from the city centre) is expected to close the Cardiff-Nantes connectivity gap only by around one-fourth. This is explained by different levels of residential density: the French city has more residents living in areas well-connected to public transport. The area highlighted in Figure 19 is one-third denser in Nantes. This underlines the importance of a dual approach of house building alongside network expansion.

If both of these things are done, then a simple estimate shows that Cardiff and its surrounding areas could be 2.1 per cent more productive

by reaching Nantes’ public transport connectivity levels (Figure 28).⁴⁰ That would be around £450 million each year, or 0.7 per cent of the Welsh economy, which could be redistributed to other areas.

Figure 20: Expansion of public transport to Nantes’ level would not fully close the connectivity gap between cities

Public transport accessibility



Source: Google Direction API and Eurostat. The area that can reach the city centre in 30 minutes by public transport in peak time. Methodology: Expansion using the average residential density of Cardiff’s areas that are 30–45 minutes away from the centre by public transport. These estimates do not account for different levels of frequency and quality of the service.

Box 4: Nantes tram system and its funding model

Nantes, like many cities in France and the UK, replaced its tram system with buses in the period after the Second World War. Decades later, the French city started rebuilding its tram network. The project started in the mid-1980s and today it has 83 stations on three lines that cover around 44km. Moreover, the system also includes two BRT lines that are fully integrated into the tram network.

⁴⁰ These estimates are only provided by Cardiff because i) transport improvements tend to have higher productivity gains in knowledge-intensive services ii) it is not clear that public transport in the remaining cities analysed is constraint, in terms of productivity. Car congestion is quite low and job dispersion in the remaining cities make connectivity to a single economic hub less relevant. For further details on point i) see: Graham D Gibbons S and Martin R (2009) Transport investment and the distance decay of agglomeration benefits.

The expansion of Nantes' public transport network has been partially financed by Versement Transport (VT), which is an income levy, targeting employers with over 9 employees, to fund public transport operations. It was first established in the Paris region in 1973 and quickly expanded to other cities.⁴¹ In 1985, when the Nantes' tram system opened VT was 1.75 per cent of each employee's wage.⁴²

In 2021, VT raised around €176 million, which is €45 million higher than in 2012.⁴³ The additional proceeds were driven by job and wage growth in the city. The VT is used to cover both operation and capital costs with the network. Unlike revenue models highly dependent on fares, VT-related revenues were proven less volatile to recent shocks like the pandemic and hybrid work. Nantes has plans to build three new lines in the coming years, with central government financial support.⁴⁴

Centre for Cities estimates show that Cardiff could raise £23 million a year with a 0.5 per cent for all full-time employees (2018 wages and prices), or £14 million with the same levy applied only to full-time workers earning more than £27,000 a year.

Policy implications

Cardiff should lead Welsh efforts of boosting public transport outcomes. This will involve:

- Expanding the existing public transport network, through both bus and rail.
- Making the most of the South Wales Metro project by providing both housing and commercial space close to stations.
- Continuing to facilitate the growth of the city centre economy.
- Introducing stronger disincentives to driving with a more geographically focused congestion charge than the one currently proposed.

41 See Centre for Cities blog 'Should transport in London be funded in the same way as in Paris?' at <https://www.centreforcities.org/blog/should-transport-in-london-be-funded-in-the-same-way-as-in-paris/>

42 For further details, see: <https://p2infohouse.org/ref/24/23424.htm>

43 Bray J (2022) Transport Authorities for Metropolitan Areas: The Benefits and Options in Times of Change, Urban Transport Group

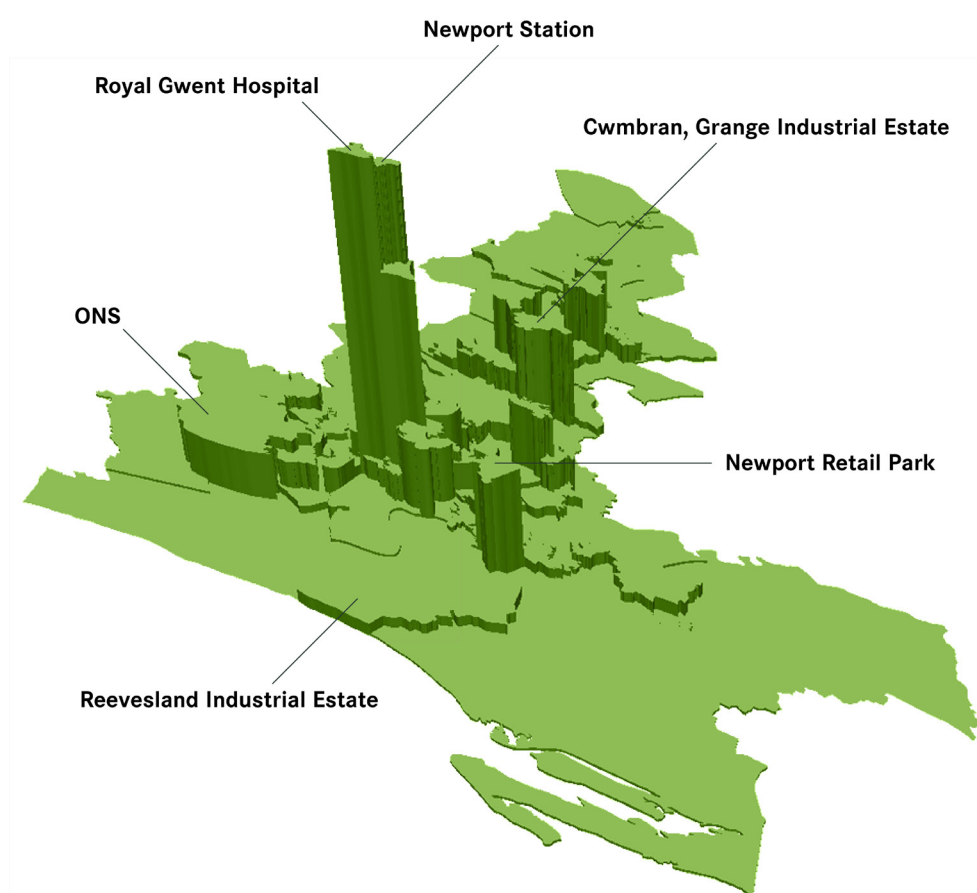
44 'French government announces €900m of grants for urban transport', International Rail Journal, 7 October 2021

Newport

Job concentration and location of economic hubs

Newport has several job centres across the city. The area with the highest job density is around the hospitals (Royal Gwent and St. Woolos), followed by the areas surrounding the central train station. Those areas account for just 8.8 per cent of all jobs in the city. Around 18 per cent of all jobs are in the lower super output areas that include Imperial Park, the ONS, and the Reevesland Industrial Estate.

Figure 21: Newport job density by LSOA, 2021



Source: ONS, BRES.

Public transport accessibility

The areas with the highest job density have relatively good levels of public transport connectivity: 44.7 per cent of the workers can reach the main stations or the areas around the hospital in 30 minutes by public transport. This means

that the number of workers able to reach these hubs via public transport is unlikely to be a constraint to economic growth.

Table 4: Newport's public transport connectivity in 30 minutes

Areas	Share of all workers that can access by public transport in 30 minutes (%)	Total number of jobs	Share of all jobs (%)	Exporting jobs and knowledge-intensive local services (%)	Other local service jobs (%)	Publicly funded jobs (%)
Newport city centre	43.0	4,300	3.9	34.3	49.9	15.8
St Woolos Hospital & Royal Gwent Hospital	20.8	6,285	5.6	0.7	1.8	97.5
At least one of the points above	44.7	10,585	9.5	14.4	21.3	64.3
All the points above	19.2	-	-	-	-	-
All the points above	4.0	-	-	-	-	-

Source: ONS (UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking), Census 2021 for public transport accessibility; and BRES.

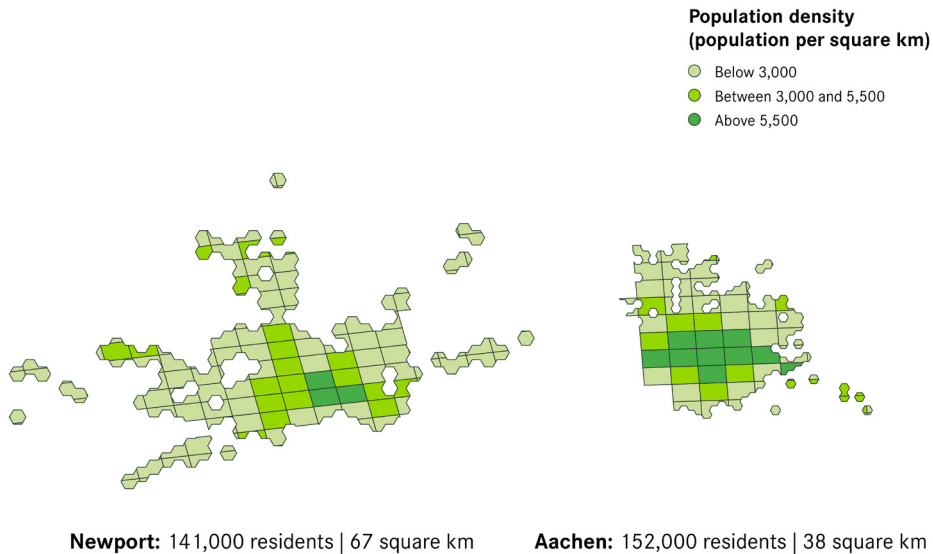
Despite the relatively high levels of public transport accessibility, previous findings show that usage is relatively low. This is driven by the relative attractiveness of driving in a polycentric labour market with low congestion, and it is this urban form that explains the differences between Newport and Aachen set out in Case Study 2. To swap the car for commuting via public transport will require low-frequency services that better serve these outer lying jobs sites, something discussed in more detail in the Swansea deep dive below.

Case Study 2: Newport vs. Aachen - it is not all about network size

Comparing Newport and Aachen supports some of the previous findings regarding the size of the network and the number of residents living nearby. Newport’s network size (areas within 30 minutes from the city centre) is 1.8 times larger than Aachen’s network size. Despite this, Aachen has around 11,000 more residents living in its best-connected areas due to its density profile.

The best-connected areas of Aachen, around its centre and transport nodes, are roughly twice as dense as the equivalent areas in Newport. Some of the differences are defined by lower residential areas with the centre. But equally important, the well-connected outskirts of Newport do not have many residents living there (Figure 22).

Figure 22: Despite Aachen’s low-scale network, its density allows more residents to be well-connected to its city centre



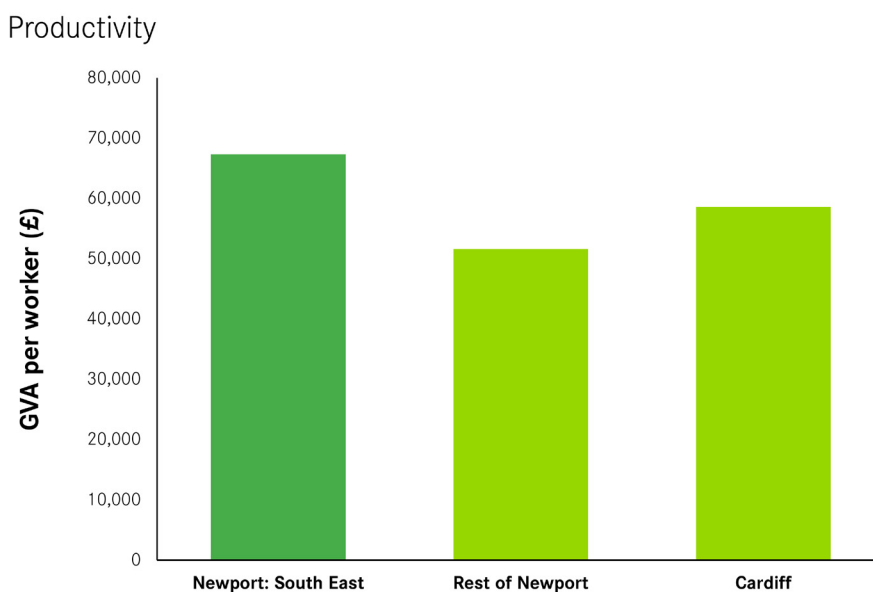
Source: Google Direction API and Eurostat and Eurostat. The area that can reach the city centre in 30 minutes by public transport in peak time. Note: To make it internationally comparable, these maps use a different data source for Newport than the rest of the report. This may explain any data differences. These estimates do not account for different levels of frequency and quality of the service.

The role of Newport in the Cardiff Capital Region economy

Ridership isn't just affected by factors in Newport itself, however, but by the relationship with Cardiff too. Newport is highly interconnected with the Welsh capital. There are around 8,300 workers living in Newport and working in Cardiff (6.7 per cent of Cardiff's workers), half of them in the most central areas of Cardiff. The relationship between both cities is not one way: Newport gets 14,000 commuters from Cardiff, which is more than the number of Newport's residents working in Cardiff. Any transport policy needs to reflect these flows.

Cardiff-Newport commuting flows are especially important in the eastern part of the city, which is next to the M4 and only eight miles from Cardiff's city centre. The area includes the Office for National Statistics, Newport Wafer Fab, and firms in the Imperial Park, among other sites. They account for 19 per cent of Newport's economy and firms that locate there are more productive than average (Figure 23).⁴⁵ In 2019, productivity per worker of the area was 15 per cent above Cardiff's, and 30.5 per cent more productive than the remaining zones of Newport.

Figure 23: The South East edge of Newport, well-connected to the M4, is more productive than the surrounding areas



Source: ONS, BRES. 'Newport: South East' include the following MSOAs: Newport 019 and Newport 020.

Of the 5,900 workers there, 37.8 per cent of them come from the Welsh capital, while Newport residents account for 49.8 per cent of the total workforce in the area. This suggests that Newport provides well-connected spaces for highly productive activities in sectors like semiconductor manufacturing, which also benefit from access to the skills of Cardiff's residents. This relationship highlights the potential economic gains from further integrating the Cardiff Capital Region

⁴⁵ The following MSOAs: Newport 019 and Newport 020.

in the long term, meaning that the South Wales Metro and Cardiff Crossrail and Circle train-tram lines are a welcome step. The recent decisions around road building – where all new roads ‘need to contribute towards achieving modal shift’ – may make this task more difficult in the decades ahead.⁴⁶

Better connectivity will require coordination between the two cities. For example, effective bus provision is likely to require inter-municipal routes. And policies like a congestion charge (discussed in Cardiff’s deep dive) or a workplace parking levy (like the one Nottingham introduced in 2012, see Box 5) will have implications across city boundaries. For instance, a congestion charge in Cardiff will apply to Newport residents working there, and the same can be said about a WPL implemented in Newport. As a result, coordination of that kind of policy between local governments – both in terms of implementation and on how to spend the revenue raised (e.g. joint purchases of transport-related equipment) – would benefit the whole Cardiff Capital Region.

Box 5: Workplace Parking Levy

In 2012, Nottingham City Council was the first and remains the only city to implement a workplace parking levy (WPL). Since then, the city council started charging employers who provide 11 or more car parking spaces, with some exemptions (e.g. NHS, delivery vehicles, among others).

The initial charge was £288 a year and in April 2023 the charge increased to £522.

Unlike the congestion charge, the system has minimal operational costs. The revenue is ring-fenced to public transport investments. The WPL contributed to the expansion of the Nottingham Tram system (17km extension), which today has more stations than the Edinburgh and West Midlands tram systems. The revenue has been also channelled towards the bus network (mostly owned by the same authority as the Nottingham Tram, Nottingham City Council) and active travel. Research shows the levy incentivised a modal shift from driving to other modes of transport.⁴⁷

The WPL is an effective tool to deal with car use and air pollution, especially in cities with relatively dispersed job markets (like Newport, Swansea and Wrexham) where employers provide parking to employees. Unlike the congestion charge, WPL does not incur the same level of upfront costs and relatively low operations costs.⁴⁸ Centre for Cities estimates shows that this policy could raise millions a year for Welsh cities, which could be used to improve and fund its public transport systems (Table 5 below).

⁴⁶ For further details see: <https://www.gov.wales/welsh-government-response-roads-review.html>

⁴⁷ Dale S Frost M Ison S and Budd L (2019) The impact of the Nottingham Workplace Parking Levy on travel to work mode share, Case Studies on Transport Policy, Volume 7, Issue 4, December 2019, Pages 749-760

⁴⁸ For further details see: <https://groups.friendsoftheearth.uk/climate-action/how-nottingham-used-parking-levy-cut-congestion-and-raise-millions>

Table 5: A £300 WPL could raise millions for Welsh cities

City	Potential revenue (£m)
Cardiff	8.2
Newport	5.0
Swansea	5.8
Wrexham	2.4

Source: BRES, Census 2011, ONS. Methodology: A lower bound estimate on the number of workers in medium (between 50 and 250 employees) and large firms (above 250 employees) for each city and then it is multiplied by the number of workers who drive to work (Census 2011). Also, we applied the Welsh rate of workers who fully work from home (19 per cent, January 2023); plus applied a modal shift coefficient of 3 per cent, based on the Nottingham experiment (Dale S, Frost M, Ison S, and Budd L (2019), The impact of the Nottingham Workplace Parking Levy on travel to work mode share, Case Studies on Transport Policy, Volume 7, Issue 4, December 2019, Pages 749-760).

In Nottingham, the WPL raised £90m in its first decade. Other cities have discussed the possibility of introducing a WPL to fund public transport improvements.⁴⁹ Leicester expected to raise £10 million a year (£550 per space, in 2021); Bristol £11 million (£400 per space, in 2011); and £4 million a year in Oxford (£600 per space, in 2022).⁵⁰

Policy implications

The approach to transport in Newport should have a short and long-term transport strategy. In the next few years, based on its economic structure and commuting flows, providing precise transport to some major employers is likely to be the way to get more people on public transport. In the future, as South Wales Metro is developed, housing development around stations will be important for fostering demand to use public transport.

49 For further details see: <https://www.mynottinghamnews.co.uk/%EF%BB%BFten-years-on-nottinghams-workplace-parking-levy-keeps-the-city-moving-ahead/>

50 For further details see:

https://consultations.leicester.gov.uk/sec/wpl/supporting_documents/WPL%20Business%20Case.pdf

<https://democracy.bristol.gov.uk/mgAi.aspx?ID=25914>

<https://www.oxfordshire.gov.uk/residents/roads-and-transport/workplace-parking-levy>

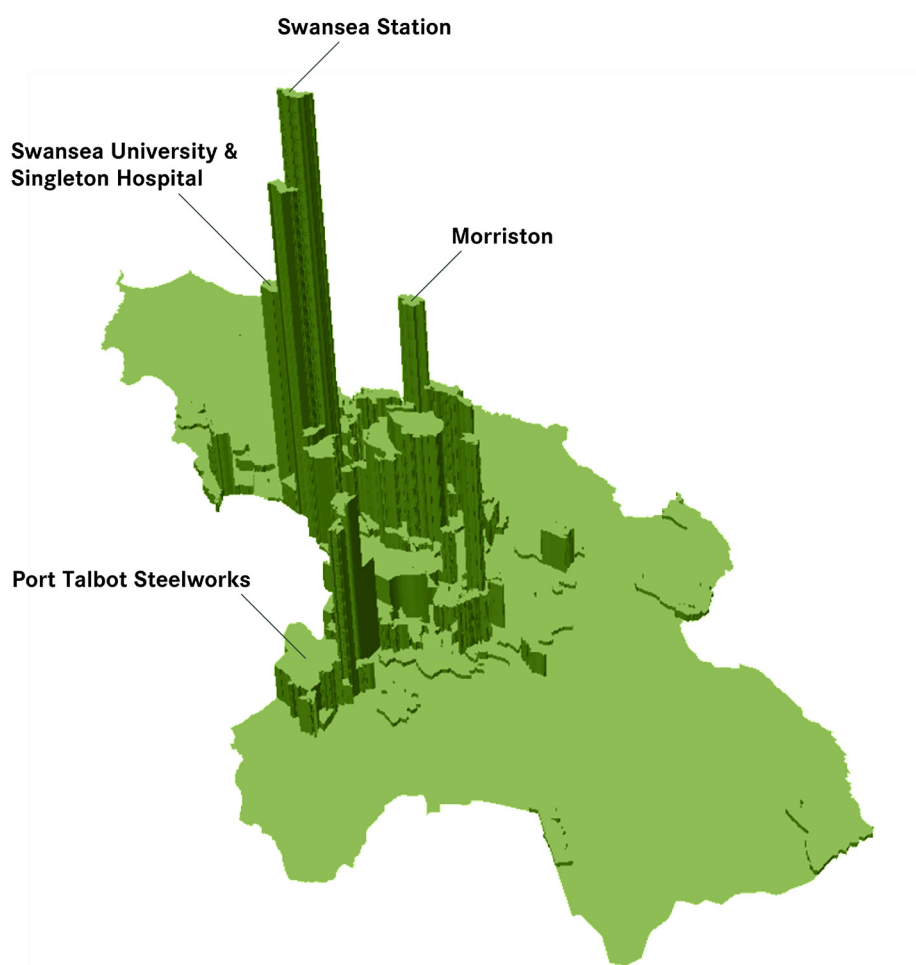
Swansea

Job concentration and location of economic hubs

Swansea's labour market is particularly dispersed as its economy includes a huge variety of activities from universities to steel works. Figure 24 highlights this by showing the polycentricity of Swansea's jobs.

The area around Swansea Central Station is the point with the highest job density but only accounts for 5.6 per cent of all jobs. The area that includes, among other things, anchor institutions like Swansea University and the Singleton Hospital accounts for another 4.8 per cent of jobs. There are also significant job centres on the edges of the urban area like the steel works (1.9 per cent of jobs) and Morriston where the Driver and Vehicle Licensing Agency is located (3.8 per cent).

Figure 24: Swansea job density by LSOA, 2021



Source: BRES, ONS.

Public transport accessibility

Table 6 shows that access to Swansea's main economic hubs by public transport is low. As shown above, this is because of the low-density nature of both its jobs and its homes. Case Study 3 shows how this affects public transport accessibility in the German city of Kiel compared to Swansea.

Table 6: Swansea's public transport connectivity in 30 minutes

Areas	Share of all workers that can access by public transport in 30 minutes (%)	Total number of jobs	Share of all jobs (%)	Exporting jobs and knowledge-intensive local services (%)	Other local service jobs (%)	Publicly funded jobs (%)
Swansea Station	38.4	8,610	5.6	29.8	52.9	17.2
Swansea University and Singleton Hospital	18.6	7,295	4.8	3.2	6.1	90.7
At least one of the points above	46.7	15,905	10.4	17.6	31.4	50.9
All the points above	10.4	-	-	-	-	-
All the points above	4.0	-	-	-	-	-

Source: ONS (UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking), Census 2021 for public transport accessibility; and BRES.

To get more people commuting by public transport there will either need to be a shift the location of its jobs, and so a structural change in the nature of its economy, or the creation of public transport services tailored to its economic structure. Dispersed jobs and shift patterns of these jobs means that successful provision needs to be tailored and operate at specific times of the day according to shift patterns rather than throughout the day.

There are several examples of where this has been done. Lidl and Aldi partner with Stagecoach to provide transport to its workforce in Bristol (Western

Approach). Some of these services operate only three times a day. In Sunderland, Go North East launched a 24-hour service that targets overnight journeys for shift workers at Nissan and Amazon. And in Germany, Viega group has a shuttle service between Colonge and its offices in Attendorf.

That said, these examples are the exception rather than the rule. Unlike high-frequency transit between suburbs and the city centre, this kind of service provision requires deep levels of knowledge around work patterns, the number of workers demanding the service, etc. Providing such routes would require active contributions and monitoring from firms and workers' representatives.

Case Study 3: Swansea vs. Kiel – how density influences accessibility

The coastal city of Kiel, like Swansea, does not have a mass transit system. Kiel's public transport network is mostly composed of buses.⁵¹ As illustrated in Figure 25, the area covered in 30 minutes by public transport is slightly smaller in Kiel than in Swansea. But the number of residents living near Kiel's public transport network is higher than in the Welsh city: the German city has almost twice the number of residents living within 30 minutes by public transport from its central area.

Figure 25: Kiel's public transport network is much larger than Swansea, even without a tram or metro system



Source: Google Direction API and Eurostat and Eurostat. The area that can reach the city centre in 30 minutes by public transport in peak time. Note: To make it internationally comparable, these maps use a different data source for Swansea than the rest of the report. This may explain any data differences. These estimates do not account for different levels of frequency and quality of the service.

51 Kiel is developing its rail network with S-Bahn Kiel, a system with 5 lines, 51 stations, and a 30-minute frequency.

Despite Swansea's larger catchment area, Kiel has a larger urban core. This means that the 'compact area' that excludes the small pockets around distance rail stations and some express buses (not seen in Kiel) is 20 per cent larger (11 square kilometres) in Kiel than in Swansea.

Policy implications

Like Newport, the low-density nature of Swansea tips the balance in favour of private over public transport. The future development of the city should aim to better concentrate both jobs in existing sites and housing to make public transport more viable, as well as exploring ways to provide low-frequency, high-provision services to its main employment sites that match the shift patterns of the employers there.

Wrexham

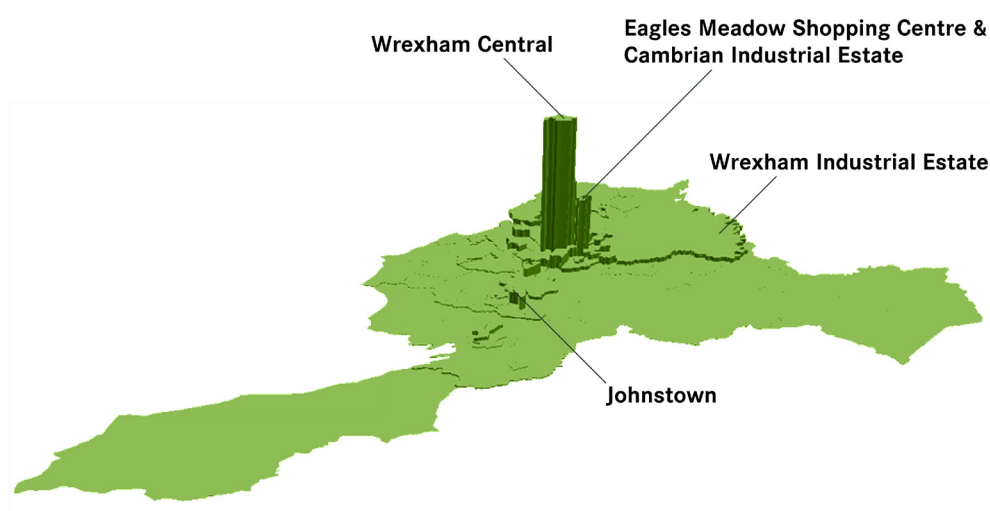
Job concentration and location of economic hubs

The centre of Wrexham is the city's only area with comparatively high job density. That area has 9,000 jobs and accounts only for 0.1 per cent of Wrexham's land area.

This should not be interpreted as Wrexham being a monocentric city. Even if Figure 26 looks monocentric, its 'spike' only accounts for 14.9 per cent of jobs. This is very different from Cardiff, where the centre and surrounding areas account for more than one third of jobs.

The remaining 85 per cent of jobs are dispersed across a large area. Take Wrexham Industrial Estate, a very important economic hub for the local areas with hundreds of firms. It accounts for a quarter of all jobs but more than 7 per cent of all land. Making public transport reliable and accurate to and from Wrexham Industrial Estate will require a lot of knowledge about shifts and specific working arrangements.

Figure 26: Wrexham job density by LSOA, 2021



Source: ONS (UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking), Census 2021 for public transport accessibility; and BRES.

Public transport accessibility

More than half of Wrexham's workers can reach its main job centre in 30 minutes by public transport. This is much higher than the actual number of people working there. As previously discussed, this is not enough to make public transport competitive. Commuters living within 30 minutes or less from their jobs may prefer to drive, especially if the journey is faster and more reliable. That said,

19 per cent of households do not own a car, so a functioning public transport network is important for this cohort of people in particular.

Table 7: Wrexham’s public transport connectivity in 30 minutes

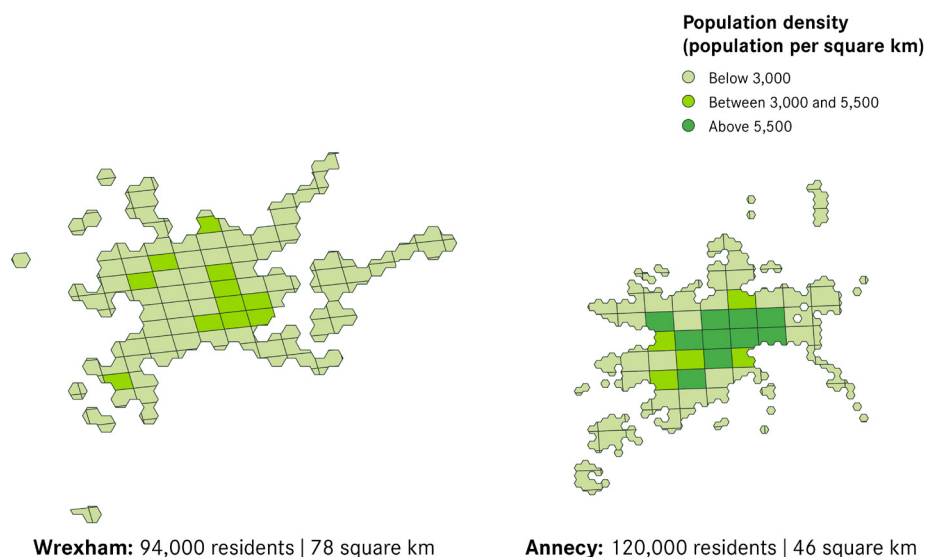
Areas	Share of all workers that can access by public transport in 30 minutes (%)	Total number of jobs	Share of all jobs (%)	Exporting jobs and knowledge-intensive local services (%)	Other local service jobs (%)	Publicly funded jobs (%)
Wrexham						
Central	59.6	9,375	15.8	13.4	13.7	73.0

Source: ONS (UK Travel Area Isochrones (Nov/Dec 2022) by Public Transport and Walking), Census 2021 for public transport accessibility; and BRES.

Case Study 4: Wrexham vs. Annecy: A comprehensive public transport system may require a different type of economy

The French city of Annecy is also close to the border, and it is relatively small. While its network covers a smaller area than Wrexham’s, most residents are well connected to its centre by public transport due to it being much denser. Annecy’s has around 25,000 extra residents living in areas well connected to its city centre.

Figure 27: Wrexham's public transport network is not smaller than Annecy, but its density is very different



Source: Google Direction API and Eurostat and Eurostat. The area that can reach the city centre in 30 minutes by public transport in peak time. Note: To make it internationally comparable, these maps use a different data source for Swansea than the rest of the report. This may explain any data differences. These estimates do not account for different levels of frequency and quality of the service.

Replicating Annecy's levels of residential density would not solve Wrexham's connectivity issues alone. The cities also have different industrial structures and spatial distribution of jobs. The French city has some manufacturing activities, but it is highly dependent on tourism-related activities that benefit from its higher density environment in the centre and some knowledge-intensive business services, firms like Ubisoft (a gaming studio), that tend to locate in central areas.

Denser and more compact environments make driving less compelling as opposed to sprawling and dispersed places such as Wrexham. Congestion-related data support this. According to INRIX, Annecy's drivers lost on average 38 hours in congestion a year (2022), compared to 12 hours in Wrexham. As a result, public transport becomes a more attractive option in cities like Annecy compared to Wrexham.

Inflows and outflows of commuters make for an even more complex picture

Wrexham's economy has a lot in common with Swansea and Newport, but it has at least one specific feature that makes public transport planning even harder: its relationship with other local authorities, both in Wales and England.

Wrexham's local authority covers a large area, typically with low residential density and job concentration. This makes driving relatively easy, not only to Wrexham but to larger job markets. Almost one-third of the workers living in Wrexham work elsewhere: around 19 per cent of workers residing in Wrexham have a job in England, and another 11 per cent work in another Welsh local authority. Liverpool City Region, Crewe and Cheshire are some of the regions that are easily accessed by car from Wrexham. Firms in Wrexham also benefit from this interconnectedness. Around 14 per cent of employees working in Wrexham live in England, and another 13 per cent live in Wales but outside the local authority.

The relationships described above make public transport provision and its planning difficult. In a labour market where workers and firms interact across multiple local authorities, it is hard to set public transport routes that can be competitive against the car, a highly flexible mode of transport. Integrating a relatively small labour market like Wrexham by public transport would require high levels of coordination between several local authorities (Wales and England) and with the Liverpool City Region Combined Authority.

Policy implications

Wrexham's urban form, smaller population and links with its broader area mean that improving public transport provision is likely to be especially difficult. In the short term at least providing specific services to Wrexham Industrial Estate in particular for those people who live and work in and around Wrexham is likely to be the area where public policy can have the biggest impact.

06

What needs to change

Different parts of Wales have a very different level of potential when it comes to improving public transport ridership. Putting policies in place that recognise this reality will be central to the Welsh Government's ambitions to reduce car usage. This section sets out policies that should be pursued to boost ridership in Cardiff, Swansea, Newport and Wrexham.

Cardiff-specific recommendations:

Goal: Improve public transport provision to the main economic hubs, which are mostly around the city centre.

Policy: Consider using bus franchising to increase the frequency and coverage of services and better integrate different modes in the network. Making this happen will require joint working between Cardiff, the Welsh Government, Transport for Wales, and the remaining authorities of the Capital City Region in the process.

This raises the question of whether creating a Transport Authority with a Metro Mayor for the Capital City Region would help provide a better governance structure to deliver these improvements and run the network. The local authorities along with the Welsh Government should consider how this model may make their public transport goals more achievable.

Doing this will require investment and funding. As part of revenue support for franchising, Transport for Greater Manchester received £78 million of the £135 million estimated cost from the UK Government to support the first five years of operation,⁵² and also received £2.4 billion as part of the City Region Sustainable Transport Settlements to undergo infrastructure improvements.⁵³ While Cardiff's size means that the magnitude of investment is likely to be lower, improvements will require similar interventions and support from the Welsh Government.

⁵² See, for example: Greater Manchester Leaders move to decision on bus franchising for the city-region, Greater Manchester Combined Authority, 12 March 2021

⁵³ For further details, see: <https://www.gov.uk/government/publications/city-region-sustainable-transport-settlements-2/network-north-crsts2-indicative-allocations-4-october-2023>

Goal: Make the most of the existing and new infrastructure by allowing more residents to live around stations and provide good quality commercial space in the most central areas of the city.

Policy: Use Local Development Orders (LDOs) around stations to increase housing densities. LDOs are a form of planning consent that differs from the usual process because they are more rules-based. Local authorities can attach conditions to LDOs to set height limits, density and developer contributions, among other things. The importance of this is that, by setting these rules up front, the risk for developers is significantly reduced. By applying LDOs to brownfield and residential sites with good access to public transport, especially those near stations, this would provide a lever to shift land use from a low-rise to a mid-rise built form, improving public transport accessibility by making it easier for people to live nearby.

In the medium term, the Welsh Government should reform the wider planning system away from the current one and towards a new rules-based system where development is lawful so long as it follows the rules. Previous research from the Centre for Cities has shown that the system does not promote redevelopment of existing urban land; large parts of suburban England and Wales are providing almost no new homes.⁵⁴ Increasing the certainty of the planning process and the supply of land for development is essential for any major increase in housebuilding, whether by the private or public sectors.

Goal: Reduce car congestion and improve air quality by having more people shift from cars to other modes of transport.

Policy: Introduce a congestion charge and use its revenue to fund the public transport network. As part of its 10-year transport strategy, Cardiff is already considering road user payment schemes to reduce congestion and help fund public transport improvements.⁵⁵ Experience from other cities shows this policy is effective in reducing car use and making public transport faster.⁵⁶ Ideally, a congestion charge should target the most congested areas of the city at specific times, instead of acting like a ‘boundary charge’ (which is one of the options currently being considered alongside a multi-zone congestion charge).⁵⁷

As a congestion charge may have regressive impacts and affect poor households and workers without credible public transport alternatives, local authorities can opt for giving exemptions to certain groups. Those exemptions can be based either on specific occupations or other socioeconomic measures.

Cardiff could introduce a WPL as well but, due to its congestion challenges, it should prioritise introducing a congestion charge.

54 Breach A and Magrini E (2020), *Sleepy Suburbs*, London: Centre for Cities

55 Cardiff’s Transport White Paper: Transport Vision to 2030, Cardiff City Council

56 Introduction to Congestion Charging: A Guide for Practitioners in Developing Cities (2015) Asian Development Bank

57 For further details, see: <https://www.cardiff.gov.uk/ENG/resident/Parking-roads-and-travel/road-user-payment/Pages/default.aspx>

Newport, Swansea, and Wrexham

Goal: Improve access to the multiple job hubs, some of which are dominated by manufacturing and other non-service activities.

Policy: Consider the introduction of bus franchising across the Cardiff Capital Region so local government can set high capacity and accurate (not necessarily frequent) services for people working in industrial estates and business parks. This is likely to require major changes in terms of the bus stop location, schedules, and total capacity. To achieve high levels of accuracy, especially for workers doing different types of shifts, local government should involve workers, firms and unions in the process of setting the routes, monitor them over time and suggest changes if necessary.

It should be considered whether the benefits of franchising the network in Swansea and Wrexham outweigh the cost of franchising. The benefits are likely to be more difficult to realise in a less dense environment, increasing the requirement for subsidy. Given this, policy options to increase co-ordination of the network could include Welsh Partnership Schemes that while more limited in their impact may be a cheaper option to deliver.⁵⁸

Policy: Encourage the expansion of existing job sites when possible, instead of dispersing jobs further with the creation of new industrial and business parks, to make this type of public transport provision easier by having more firms and workers in those areas to run services.

Goal: Reduce car use, carbon emissions and funnel additional revenue towards the public transport network.

Policy: Introduce a workplace parking levy. Due to the nature of these cities – relatively low levels of congestion and polycentric labour markets – a congestion charge does not seem to be the most effective way of taking commuters out of their cars. The experience from Nottingham shows that a WPL can be an effective tool to reduce car use by directly disincentivising driving and channelling revenue towards public transport improvements. Exemptions can be applied when local authorities find them appropriate.

Newport: integration in the broader Capital City Region

Goal: Better integration of Newport in the wider Cardiff Capital Region.

Policy: Coordinate car-restricting, revenue-raising policies with the capital. For example, if Cardiff goes ahead with congestion charging, and Newport implements a workplace parking levy, both authorities should set a joint strategy to use those funds. This would allow savings to be made (e.g. combined

⁵⁸ The Bus Services (Wales) Bill was introduced in early 2020 but fell because of COVID pandemic. The First Minister has included the bill as part of his legislative agenda for 2023/24, that includes Welsh Partnership Schemes. For further details, see: <https://www.gov.wales/first-minister-announces-welsh-governments-legislative-programme>

purchases of buses) and help with the continual process of integration which started with South Wales Metro.

Appropriate for all cities

Goal: Make public transport more competitive against the car, in terms of speeds.

Policy: The local authorities should exempt bus lanes from the new 20mph speed limit when they find it safe and appropriate. This could make public transport more competitive against the car and increase the benefits of building new bus lanes. By restricting these speed exemptions only to bus lanes, this should not create a safety issue with other modes of transport.

Goal: Make public transport more competitive against driving in terms of cost and raise additional revenue to subsidise public transport, ideally in ways that promote modal shift.

Policy: The Welsh Government should ask for powers to raise fuel duty and use the revenue to subsidise public transport services. According to the ONS, a fuel duty freeze will cost the UK Exchequer £15.1 billion between 2023/24 and 2027/2028, more than the funds the UK Government has allocated to the City Region Sustainable Transport Settlements until 2031. The Welsh Government would receive around £500 million from that total if it accounts for the same amount of fuel duty revenue as it does in terms of GVA (3.4 per cent).

Policy: In addition to the congestion charge and WPL recommendations above, there are other tools local government is able to use to guarantee affordable transport:

- **Council tax:** The Welsh Government is currently considering council tax reform. In doing so it should give greater flexibility to local authorities to set a council tax surcharge as a source of revenue to support their public transport networks. This would follow the logic of the existing council tax premium for empty and second homes; or the extra band already in place in Wales.⁵⁹
- **VT-style tax:** The Welsh Government could use its powers around income tax to allow local authorities to levy an income tax that could be used for local services like transport. A similar policy has been in place in France since the 1970s and has been relatively successful in funding public transport systems. This type of levy can raise millions of pounds a year for each city to support (revenue estimates in Table 10).
- **Business rates:** Using business rates as a way of funding public transport is not new in the UK. London implemented a ‘Crossrail Business Rate Supplement (BRS)’ to fund part of the Elizabeth Line.

⁵⁹ For further details see: <https://www.instituteforgovernment.org.uk/explainer/tax-and-devolution>

In 2010, a two pence (2p) business rates supplement on larger non-domestic properties in London, since April 2023 onwards, only applied for non-domestic premises with a rateable value of above £75,000.⁶⁰ A similar type of supplement could be implemented in Welsh cities. For example, it could be used to fund public transport services to specific job sites in relatively isolated areas (i.e. business parks, industrial units, etc), with a supplement from those businesses supporting high-precision, high-capacity and low-frequency services to hubs where they are required.

⁶⁰ For further details see: <https://www.london.gov.uk/programmes-strategies/business-and-economy/promoting-london/paying-crossrail-business-rate-supplement>

07

Appendix

Peer cities in the analysis grouped by size

The tables below show the cities in each size category used for this report, and their respective peer city based on population. The UK peer cities selected take into account their industrial structure (i.e. similar shares of manufacturing) and their public transport outcomes (i.e. the share of commuters using public transport is higher than Welsh peers).

Table 8: Welsh cities and respective peers

City (population bracket)	Domestic peers	International peers
Cardiff (350,000 and 550,000)	Edinburgh, Reading and Brighton	Nantes; Bremen; Dresden; Hannover; Nürnberg; Duisburg; Nice; Strasbourg; Grenoble; Montpellier
Swansea & Newport (240,000 and 300,000)	Sunderland, Hull, Plymouth	Kiel; Aachen; Augsburg; Wiesbaden; Rennes; Mönchengladbach; Gelsenkirchen; Braunschweig; Chemnitz; Tours
Wrexham (125,000 and 145,000)	Dundee, Exeter, Ipswich and Gloucester	Annecy, Aix-en-Provence, Dunkerque, Limoges, Perpignan, Brest, Avignon, Ingolstadt, Fort-de-France, Würzburg

Source: ONS and Eurostat.

Table 9: Estimates of public transport commutes if Welsh cities converged with their peers

City	Business as usual	Converging with domestic peers	Converging with international peers
Cardiff	18,400 to 25,700	31,000 to 43,500	31,000 to 43,300
Newport	6,100 to 8,500	9,100 to 12,700	12,800 to 17,800
Swansea	6,100 to 8,500	12,600 to 17,600	17,800 to 24,800
Wrexham	2,500 to 3,500	4,100 to 5,700	4,500 to 6,300

Sources: ONS, Census 2011, Eurostat. Methodology: Business as usual scenario uses Census 2011 commuting take-ups, adjusted to 2021 jobs (BRES). **Methodology: Business as usual:** based on 2021 employment levels and the city's public transport commuting rate (Census 2011). **Converging with domestic peers:** based on 2021 employment levels and the average public transport commuting rate from domestic peers (Census 2011). **Converging with international peers:** based on 2021 employment levels and the average public transport commuting rate from international peers (Eurostat, 2011 for French cities and 2021 for German cities). The intervals are computed using a **lower bound** that only included people who travel to work (58 per cent in Wales) and an **upper bound** that adds hybrid workers (84 per cent.)

If the Welsh cities can achieve the public transport shares that their international peers currently do, only 11 per cent of all commutes in Wales would be by public transport. This would be an increase from the current 7 per cent of If we assumed that the share of active transport commutes remains stable, 23 per cent of all commutes in Wales would be by public transport or active transport. While noting that this data looks at commutes only, it does show that large scale intervention will be required to meet the Welsh Government's goal of 45 per cent of journeys to be undertaken by public and active transport.

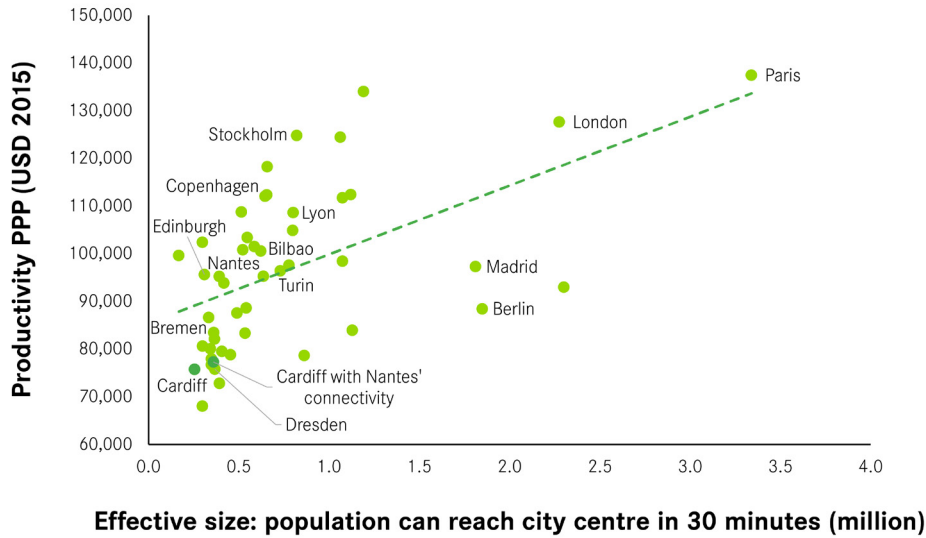
Figure 28 below is a visual representation of what the simple modelling in this would mean for the correlation between cities' 'effective size' (population within 30 minutes from the centre by public transport) and productivity. The intention is not to provide a prediction – as residential and job density and other factors influence these outcomes – but to show how the 'effective size' of a city is associated with higher productivity.

Effective size and productivity

In line with agglomeration theory, cities across most European countries become more productive as they get larger. Using this simple relationship, Figure 28 shows how increasing Cardiff's effective size would impact on its productivity. In doing so, it assumes that Cardiff would increase its productivity by increasing its size at the pace defined in the trend line. This means that Cardiff would still underperform compared to the trend line.

Figure 28: Visual demonstration of the estimated economic improvement associated with an increase in public transport accessibility and ‘effective size’

Productivity and effective size



Source: OECD metro areas; Google Direction API; Eurostat.

Estimates of what a VT-style charge could raise

Table 10: Potential revenue from an income tax surcharge similar to the French VT

City	0.5 per cent for all full-time workers, £ million (2018 values)	0.5 per cent tax for top four deciles £ million (2018 values)
Cardiff	23.0	13.6
Newport	10.7	6.4
Swansea	15.9	9.4
Wrexham	6.1	3.6

Source: ASHE, Centre for Cities calculations.



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