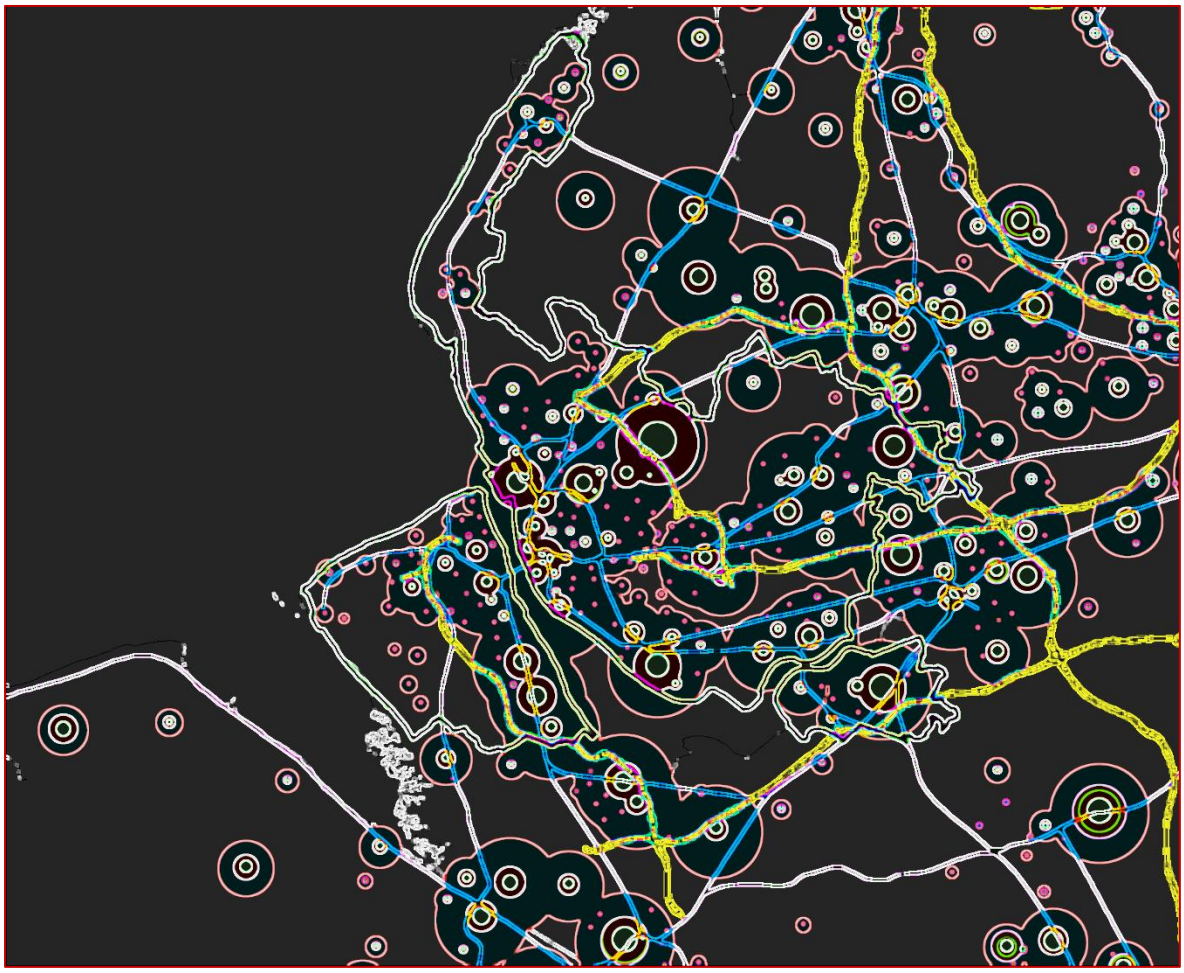
Local Transport Plan 4

Supporting Evidence

Identifying the problems and opportunities to help reach solutions



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Section 1. Introduction

This document provides much of the supporting evidence for the Liverpool City Region's fourth Local Transport Plan (LTP4) and is used to highlight the key transport-related issues, support the emerging preferred way forward, and ensure that the Liverpool City Region is evidence-led in ongoing development of transport schemes and policy.

A significant focus of this supporting evidence is around dealing with two issues. Firstly, recognising that there is a need to decarbonise transport in order for the city region and UK to play its part in reaching net zero, given the threat of global warming (***Section 3***). Nor can this work focus solely on greenhouse gases, as particulate emissions are a connected issue, affecting the health of Liverpool City Region residents. Secondly, there are a range of challenges for the Liverpool City Region economy (***Section 4***), including high levels of deprivation and gaps in economic performance; transport in itself cannot tackle all of these issues, but it can often be an enabler of change.

Evidence matters in developing transport solutions, and this matters now more than ever, with the direct and indirect impacts from the COVID pandemic having impacted travel supply and demand patterns (***Section 5***). Accordingly, where possible, it is recommended that evidence is viewed in three different segments: The trends evidenced up to the start of the pandemic; the impact of the pandemic; and (where possible) emerging signs of recovery and what the picture may be for transport going forwards. In the light of the latter, LCR has developed four forward-looking scenarios for transport demand which aim to provide a range of plausible futures for schemes and policy to be tested against (***Section 7***).

There is a particular focus in this document on freight (***Section 9***), the visitor economy and its relationship with transport (***Section 11***), and the causes and extent of Transport Related Social Exclusion (***Section 10***).

It is also important to continually review and improve data, to ensure decisions are always based on the best available date. This document also sets out how the evidence base will be updated and flags those areas of research that are either at risk or which need improvement (***Section 12***).

Key transport statistics for the Liverpool City Region are shown below (presented in wider detail in ***Section 6***), followed by a summary of the key messages from the data.

Headline Transport Statistics

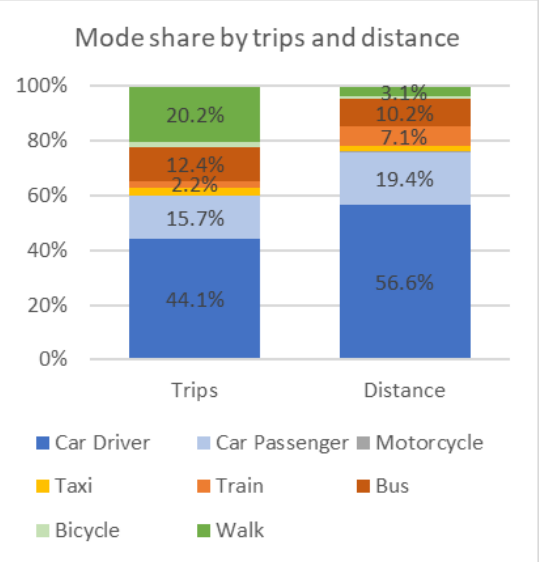
Mode share

Local survey data[1] suggests that:

- 44.1% of all trips across the city region were by car drivers.
- 14.6% of all trips across the city region were by public transport
- 22.0% of all trips across the city region were by active travel
- In terms of distance travelled, car drivers accounted for 56.6%, public transport 17.3%, and active travel 4.0%.

According to DfT and ORR statistics, on a per capita basis for the city region, in 2019/20 there were 3,503 miles travelled by car, 67.9 bus trips and 71.1 rail trips.

Mersey Ferries also form an important part of the local transport mix, both for cross-river commuters and leisure journeys, recording 610,802journeys in 2019.



	LCR	London	England excl London
Car miles per capita	3,503	1,949	4,697
Bus trips per capita	67.9	233.3	41.9
Rail trips per capita	71.1	104.9	33.0

	England	LCR
% households with no car		
Census 2011:	25.8%	34.4%
Census 2021:	23.5%	30.2%
% households with 2+ cars		
Census 2011:	32.0%	24.3%
Census 2021:	35.2%	28.1%
Battery electric cars per 1000 pop		
2019 (Q1):	0.66	0.36
2023 (Q1):	4.32	2.40

Car ownership

Car ownership in the city region has increased; in the 2011 Census 24.3% of households had no car; in the 2021 Census this was 28.1% of households. The city region still has a higher level of households than average with no car – in 2021 this was 30.2% of households (although a lower level than in 2011, when it was 34.4%.

Uptake in both electric cars and the increase in rapid charge points falls below national levels[2]. In 2023 (Q1) the Liverpool City Region recorded 2.40 battery electric vehicles per 1000 population, compared to 4.32 nationally.

Transport Related Social Exclusion

8.7% of the city region population live in areas defined as being at high risk from Transport Related Social Exclusion[3].

[1] Countywide Household Survey
[2] Vehicle licensing and EV Charging Statistics, DfT
[3] TfN research into TRSE https://transportforthenorth.com/social-inclusion/

Transport and carbon emissions

Transport formed 32.3% of all CO2 emissions in the LCR in 2019[4]. Although this dropped to 28.2% in 2021 (partly due to COVID impacts) this may have grown since, given changes in road traffic.

Transport emissions were lowest per capita in Sefton (1.1kt), Liverpool (1.3Kt) and Wirral (1.4kt); but were higher in St.Helens (1.8kt), Halton (2.1kt) and Knowsley (2.6kt).

Cars accounted for 68.6% of road energy use[5] in 2021.

	LCR		England	
	2019	2021	2019	2021
Transport as a % of all emissions	32.3%	28.2%	37.2%	34.7%
Car % of road energy use	*68.6%*	*64.3%*	*62.8%*	*57.7%*
LGV % of road energy use	*15.5%*	*17.3%*	*15.9%*	*18.1%*
HGV % of road energy use	*12.8%*	*15.7%*	*18.3%*	*21.0%*
Total vehicle miles (million)	5,752	5,174	289,473	254,369
Car vehicle miles (million)	*4,646*	*4,053*	*225,160*	*189,675*
LGV vehicle miles (million)	*818*	*846*	*45,134*	*45,751*
HGV vehicle miles (million)	*214*	*215*	*14,904*	*15,237*

Accidents

In 2021 there were 2,773 reported casualties on the City Region roads[6], including 465 killed or seriously injured. Of the latter, 58.5% were pedestrians or cyclists.

Road casualties, LCR	Car	Motor bike	Pedestrian	Bicycle
Reported	1,425	235	618	495
KSI	98	95	162	110

Freight

The port of Liverpool saw 22.6m tonnes of cargo in 2021[7] (33.6m including liquid bulk). This included 6.6m tonnes of Lo-Lo, 7.6m tonnes of Ro-Ro, 8.7m tonnes of other bulk freight.

In terms of total road freight, there were 38m tonnes of goods moved from the City Region and 38m tonnes of goods moved to the City Region[8].

Cross-boundary and leisure travel

Cross-boundary travel is an important component of LCR transport demand, covering 37% of commuting trips[9].

Liverpool City region recorded 5.4m staying visitors and 60.8m day visitors annually[10] pre-COVID.

Liverpool John Lennon Airport recorded 5.0m passengers in 2019, and by July 2023 had reached 86% of pre-COVID levels[11].

In 2019 there were 648,000 passengers using the Irish Sea ferry routes to Liverpool. By 2022 this had increased to 801,000[12].

[4] UK local authority and regional greenhouse gas emissions national statistics, BEIS
[5] Road transport energy consumption, BEIS
[6] STATS19, DfT
[7] Port Freight Statistics, DfT
[8] Road Freight Statistics, DfT
[9] Census 2011, ONS
[10] STEAM data, LCR LEP
[11] CAA Airport Statistics
[12] Sea Passenger statistics, DfT

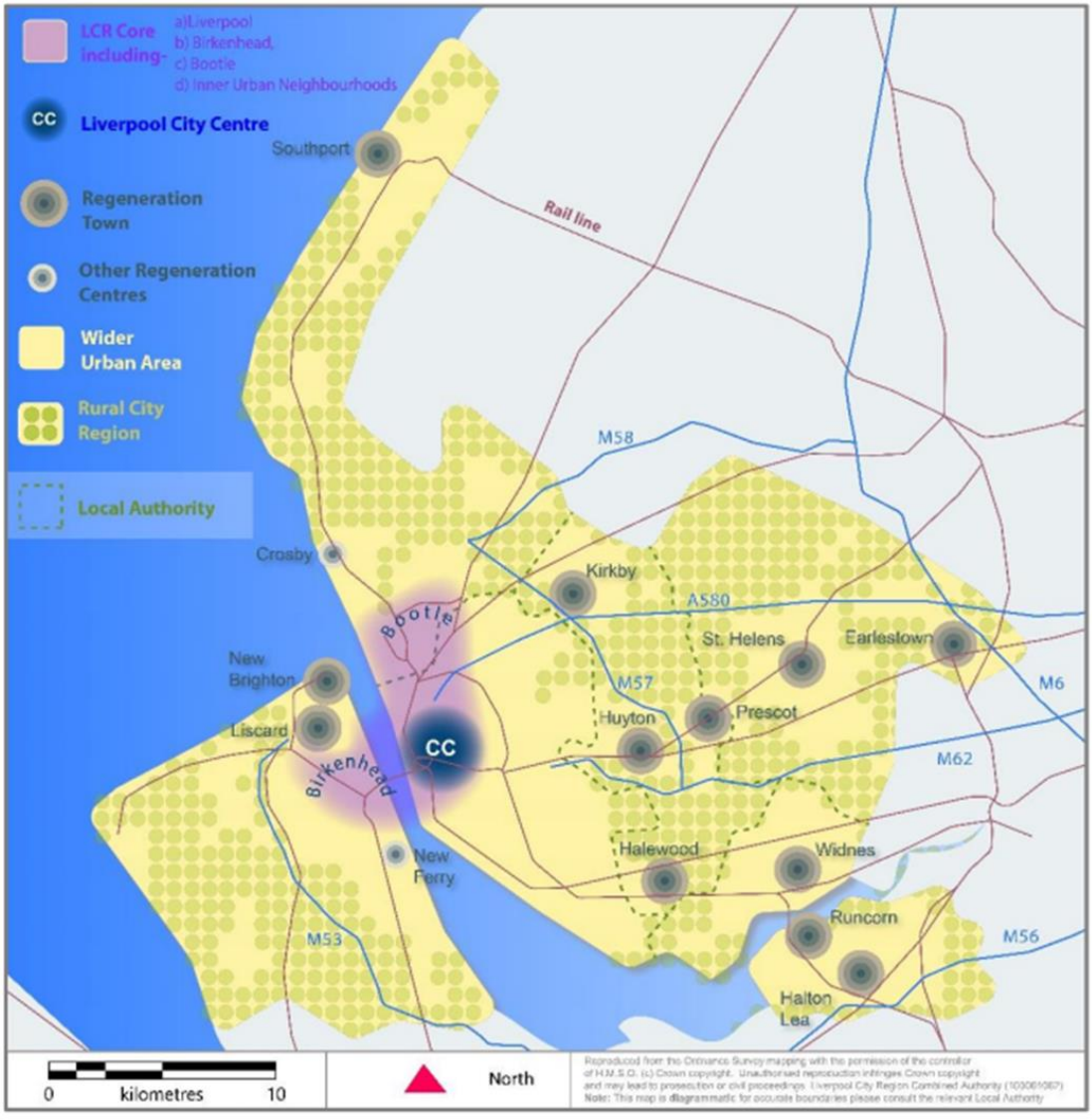
Seven key messages from the data

- **Meeting net zero is key**. Significant changes required if transport is to meet local (2040) or national (2050) targets. At the same time, the other challenges facing the Liverpool City Region are important, including both the economic gaps to national levels and more recently COVID recovery and the cost of living.
- **Significant levels of mode shift are required**. The current high dominance of car use has continued to grow, with the risk of a car-led recovery in the post-COVID world. Although there is inherent potential for more active travel, amongst public transport bus use had shown a longer-term decline, albeit less so on the QBN network; and whilst Merseyrail and long-distance rail showed strong growth, this was less the case for other local rail routes.
- **All transport modes matter**. Each individual mode has its strengths and weaknesses. Playing to the strengths while addressing weaknesses will be important in achieving the mode shift above. This will include improving integration both within and between modes.
- **Geography matters**. Individual areas of the city region face different challenges. Whilst for some areas high car ownership and use may pose an environmental issue, all areas see varying levels of connectivity, some areas may be at risk of transport-related social exclusion, and some areas may reflect issues caused by a lack of integration between transport and spatial planning.
- **The end user matters**. To achieve the eventual preferred strategy of the LTP, there is a need to understand the end user, so as to overcome the barriers – perceived or actual – in changing travel behaviour. User satisfaction, and perceptions and motivations (including of non-users) are all important here.
- **The Liverpool City Region is not an island**. Both in terms of movements of people and goods there are significant interactions with both its hinterland and further afield. This also includes both the visitor economy and the port. The LTP will need to consider transport issues related to cross-boundary trips.
- **The future is uncertain**. Whether in terms of the economy or travel behaviours, previous trends cannot be relied on to predict future travel demand or behaviours. The development of a strategy in the LTP – and individual schemes – will need to be tested against a range of future scenarios.

Section 2. Introduction to the Liverpool City Region

The Liverpool City Region is a functional economic geography covering the Local Authority areas of Halton, Knowsley, Liverpool, Sefton, St.Helens and Wirral. The City Region is home to a resident population of almost 1.6 million and a workforce of around 650,000. Close to 85% of all travel-to-work flows are self-contained within the City Region.

The Liverpool City Region economy produces £34bn of GVA (gross value added) annually, equivalent to 2% of the national GVA. Liverpool is the commercial, cultural and transport hub of the region, with a strong public sector, thriving visitor economy, and growing ICT and professional sectors. The other local authority areas provide complementary strengths, including chemicals, science and technology in Halton, automotive manufacturing in Knowsley, transport and logistics in St.Helens, and health and public admin and culture in Sefton and Wirral.



Source: Liverpool City Region Spatial Development Strategy (confirm before external version)

The City Region is both well connected domestically and internationally, albeit with a number of challenges that could strengthen its offer, if addressed. Its coastal location in the North West provides strong economic connections with neighbouring areas (including Lancashire, Cheshire and Greater Manchester). At the same time, the City Region's growing ports and airport provides

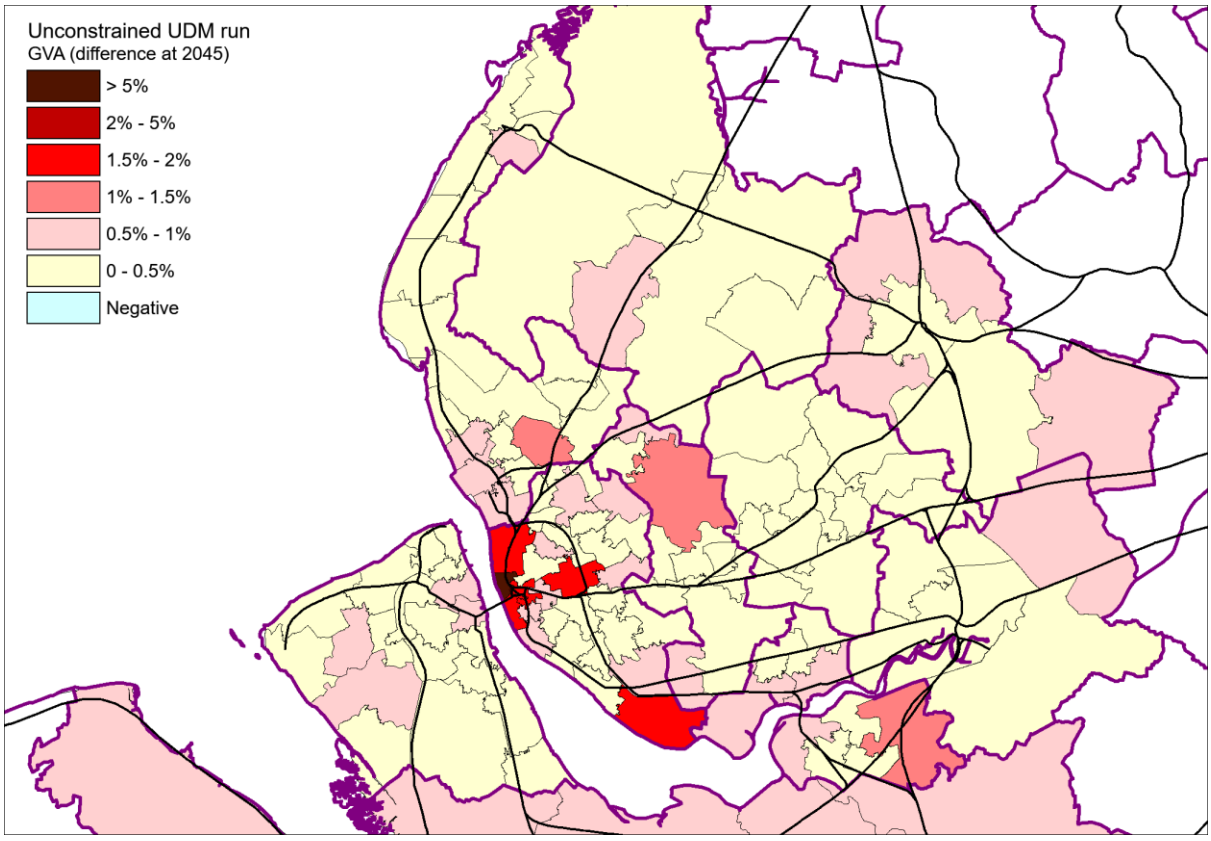
overseas connections. Home to both the UK's largest westward facing port (which is also the UK's largest port for trade with America), and a recently announced freeport, the importance of LCR in supporting the UK's international connectivity will only increase.

An important element of the City Region of specific relevance to transport is its visitor economy. Liverpool itself (pre COVID) was the fifth most visited city in the UK by overseas tourists, with the sector responsible for £5bn GVA in a sector covering culture, sports, conferences and more.

Despite significant resurgence and growth over recent decades, longstanding socio-economic challenges remain in LCR. Many of LCR's communities face entrenched and widespread deprivation, with 34% of LCR's neighbourhoods in the 10% most deprived nationally. Health challenges persist, with residents expected to have three years less of healthy life than average, and labour market gaps remain, with employment and economic activity still below national averages.

Transport can play a significant role in addressing many of the LCR's economic challenges; both in terms of enabling access to employment and skills, but also in terms of considering cleaner air as a result of transport related pollution, increasing physical activity, and creating more of a sense of place. Then there are other aspects of transport in the economy to consider: ensuring international connectivity, enabling efficient movement of goods and services, attracting inward investment. As an example of what might be achieved, the city region's urban dynamic model has been run to show what might occur if transport constraints were removed. Note that these are not all possible impacts, but simply shows where, spatially, particular wider economic impacts might occur. These need to be viewed in the light of the transport user experience, for both people and goods, as explored later in this this report.

UDM Model Run – Constrained vs Unconstrained GVA growth



Thus, as an example, for manufacturing there is an imperative on ensuring the movement of both raw materials and finished products does not see friction, but also on enabling access to skilled labour. By contrast many service-sectors may have seen less of a reliance on physical access to employment, but increased productivity is reliant on the ability to connect people over longer distance in person. And of course, the city region's visitor economy shares a symbiotic relationship with transport.

Future major investments are something to be considered within the planning of LTP4; whether the movement of people or goods, these are both dependent on ease of movement (as highlighted above in terms of potential economic impacts), but also place addition capacity needs on the transport network. As an example, the following confirmed developments will add to passenger and freight requirements.

Major housing developments			Major commercial developments		
Local Authority	**Site**	**Dwellings**	**Local Authority**	**Site**	**Size (ha)**
Sefton	Land East of Maghull	1,700	St. Helens	Parkside	204
Wirral	Bebington, Bromborough and Eastham	1,848	Halton	Widnes Waterfront	53
Liverpool	Liverpool Waters: Central Docks	1,988	Halton	West Runcorn	54
St. Helens	Bold Forest Garden Suburb	2,988	Halton	3MG	35
Wirral	Wirral Waters	3,169	St. Helens	Omega Extension	31

The Liverpool City Region is a significant and dynamic area of the UK, but with even more potential than it currently achieves if the factors behind performance gaps are addressed – and one of those factors is the role transport plays. All of this needs to be seen through the prism not just of social and economic challenges, but also in terms of the need to reach net zero in carbon emissions (Section 3).

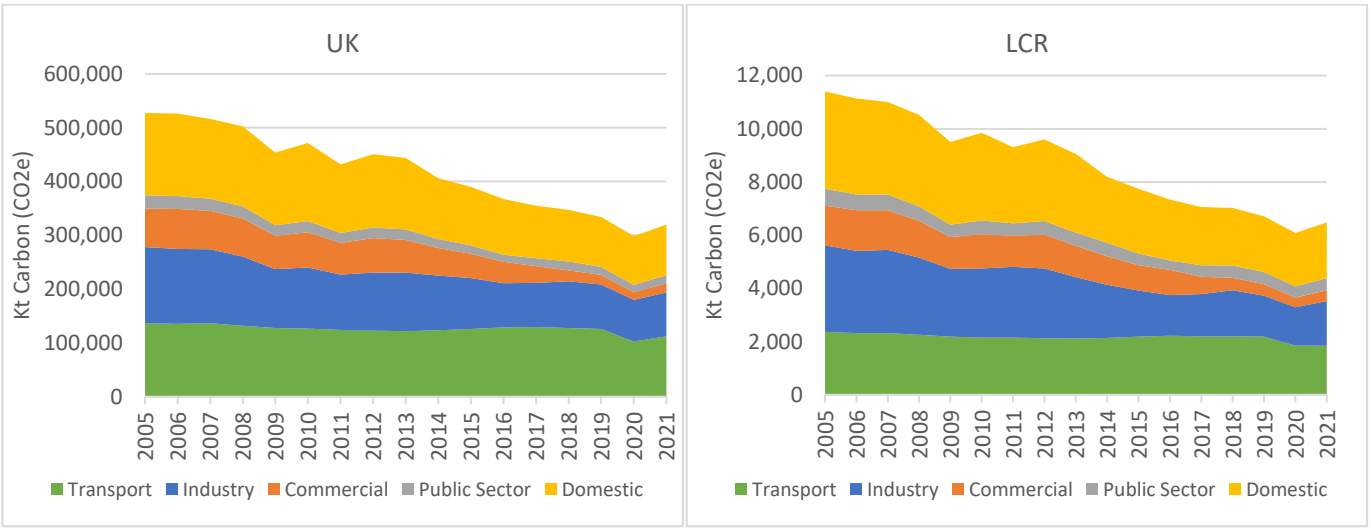
Section 3. Transport and net zero

There is an imperative to achieve net zero in terms of carbon emissions. The Liverpool City Region has declared a climate emergency, with the aim of reaching net zero by 2040, whilst the UK Government has set a target for the country as a whole of achieving this by 2050. Transport data here provides a strong narrative, in terms of both challenges and opportunities as options as to how this is achieved are developed.

Compared to other broad sectors of the economy, it is well evidenced that transport has not played its part in reducing emissions, and this applies as much in the Liverpool City Region as in the wider UK. Up to 2019 emissions from transport had reduced nationally by -9.7% and in the Liverpool City Region by -7.6%. Transport represents an increasing proportion of emissions, both nationally and in the Liverpool City Region. Note also that this does not include international aviation and shipping emissions (see later), meaning the challenge for transport is larger than shown below.

Only in the recent years have transport emissions dropped significantly, although this may well be partially reflective of the pandemic restrictions and ongoing impacts. To give some indication of the impact of the pandemic restrictions, transport emissions in Liverpool City Region were 15.7% lower in 2020 than in the previous year, with only a small 'recovery' in 2021. It is still unclear the extent to which travel demand has changed on the longer-term trajectory. Data already indicates traffic levels were higher in 2022 than 2021; thus, most analysis here concentrates on 2019, to understand the potential scale of the challenge.

Transport and Carbon – UK and LCR



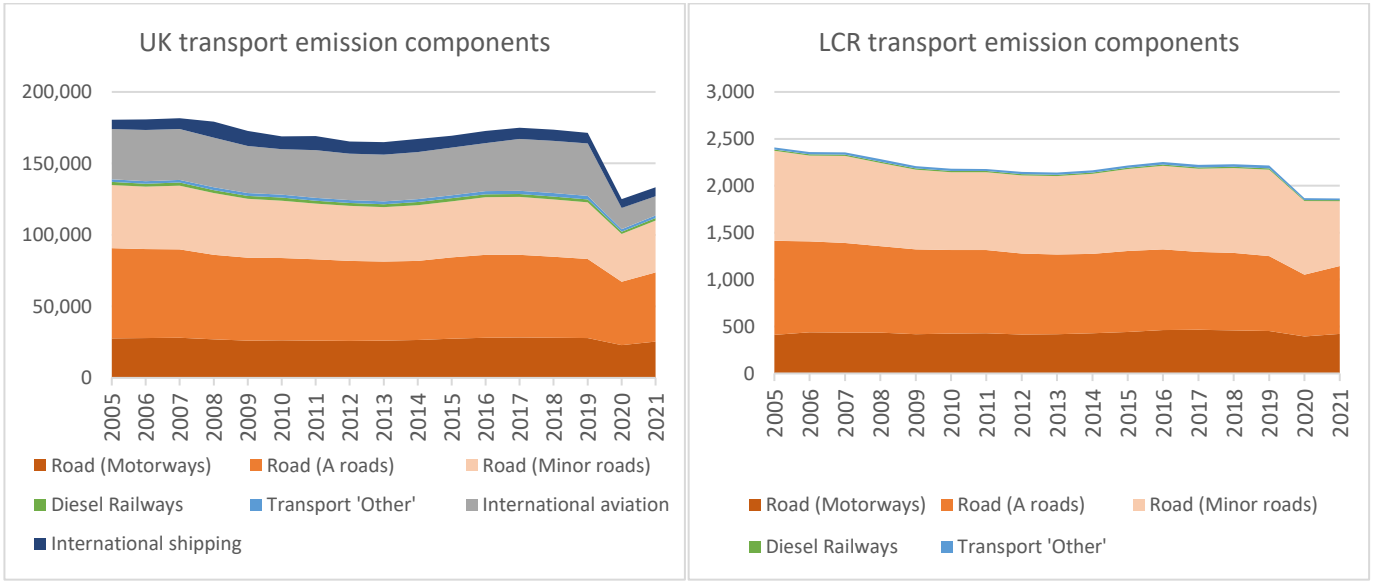
			2009	2014	2019	2021
Transport CO2 reduction from 2005						
		UK	-6.6%	-9.7%	-8.1%	-17.9%
		Liverpool City Region	-7.9%	-9.7%	-7.7%	-22.2%
Transport as a % of all CO2 emissions						
		UK	27.8%	30.2%	37.2%	34.7%
		Liverpool City Region	22.8%	25.9%	32.3%	28.2%
	Halton	**Knowsley**	**Liverpool**	**Sefton**	**St.Helens**	**Wirral**
Transport emissions (Kt CO2e) 2019	260.5	359.5	566.8	271.2	320.8	404.5
Per capita	2.0	2.3	1.2	1.0	1.8	1.3
As a % of total emissions	37.2%	44.3%	32.2%	22.6%	28.7%	34.4%
Change 2005-2019	*1.4%*	*1.3%*	*-13.9%*	*-8.7%*	*-3.8%*	*-12.9%*
Change 2019-2020	*-16.6%*	*-12.8%*	*-17.1%*	*-16.2%*	*-14.6%*	*-16.2%*
Change, 2019-2021	*-15.2%*	*-13.2%*	*-19.5%*	*-14.7%*	*-12.2%*	*-16.4%*

Source: UK local authority and regional greenhouse gas emissions national statistics, BEIS; Carbon, measures in KtCO2(e)

Within the transport sector, the majority of emissions are from road, representing 32.1% of *total* CO2 emissions in the city region, whilst rail accounted for 0.2%. In part this latter figure reflects that a majority of rail operations – including the Merseyrail Electrics – are electrified, but there remain a large number of movements on the City Line and elsewhere that are diesel-based, including many freight services. There are advantages from rail electrification – including faster journey times – but in terms of decarbonisation, the numbers suggest mode shift away from road is the larger issue. Note that the road emissions would include those from buses and coaches too, but in terms of the volume these comprise of all traffic (as seen later) this is not as significant as car, HGV and LGV traffic; noting also there is investment being made in hydrogen buses by the Liverpool City Region.

As indicated above, none of this includes emissions from international shipping and aviation. These aren't included at a local level – and indeed, are not always reported in UK total transport emissions. Inclusion of these would elevate emissions by c.34%. this is of concern, as although zero-emission shipping solutions are emerging, aviation is still at an early stage of developing options. This raises an important local issue; the Port of Liverpool and Liverpool John Lennon Airport can offer significant net national benefits in reducing emissions (through reduced surface access mileage and more efficient use of assets), but this would risk increased international emissions at a local level, even if not *accounted* for locally.

Components of emissions from transport

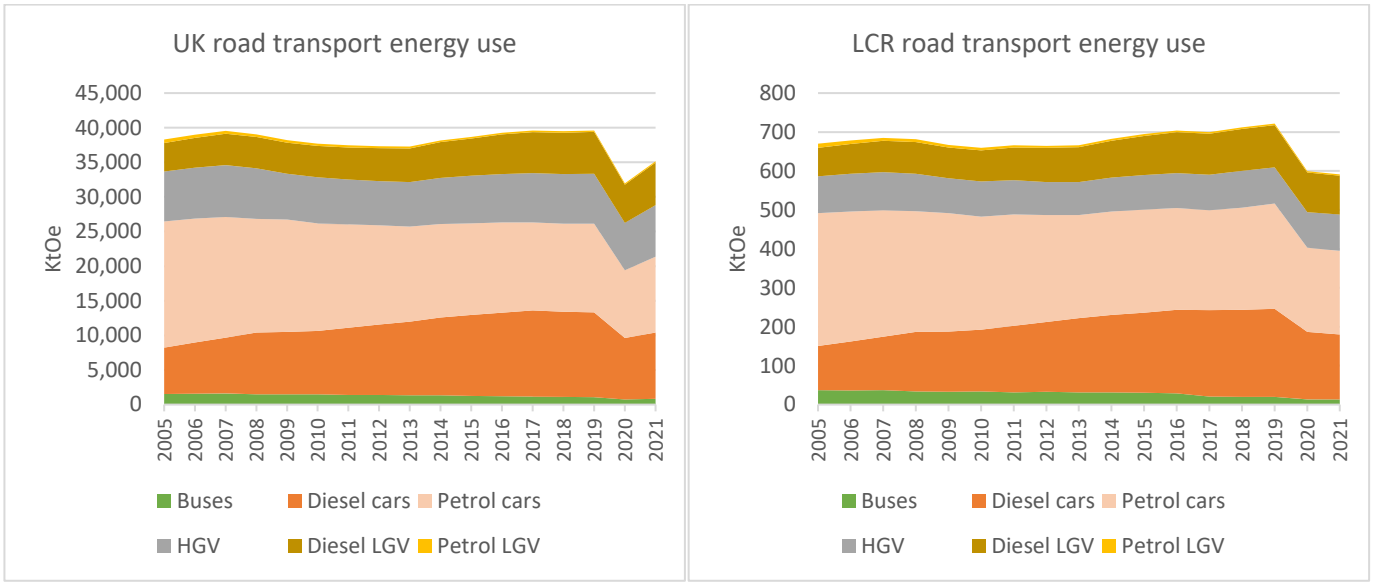


Source: UK national / UK local authority and regional greenhouse gas emissions national statistics, BEIS; measures in KtCO2(e)

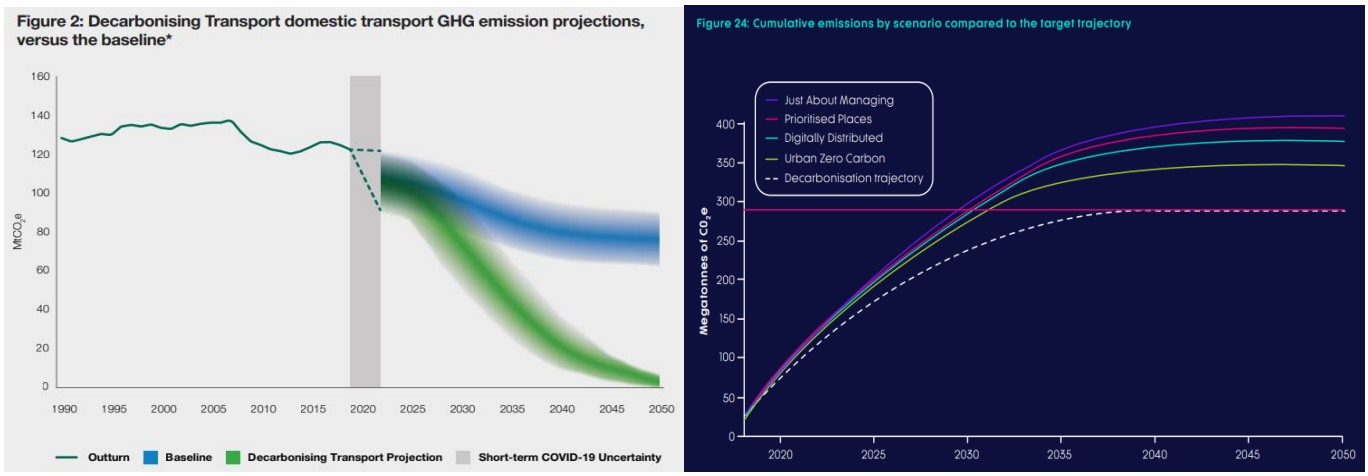
Detailed data on road traffic energy use points to much of these emissions coming from cars (see below). This has increased continuously from 2010, and by 2019 cars accounted for 69% of all LCR road transport energy use. LGVs represented a lower proportion of energy use but showed an increase – up from 13% of all road transport energy use in LCR in 2009 to 16% in 2019. By contrast, HGVs have shown little change; during 2019 they accounted for 13% of all road transport energy use in LCR, down marginally from 2009. (This may also include changes in logistics operations, such as some freight traffic moving to LGVs.)

All the above change to some extent reflects on improvements in engine technology, as actual traffic volumes over this period have risen sharper than this data would suggest. This is presented in later sections, together with progress on the uptake of zero emission vehicles.

Road transport energy and pathways to net zero



Source: Sub-national road transport fuel consumption in the United Kingdom, BEIS

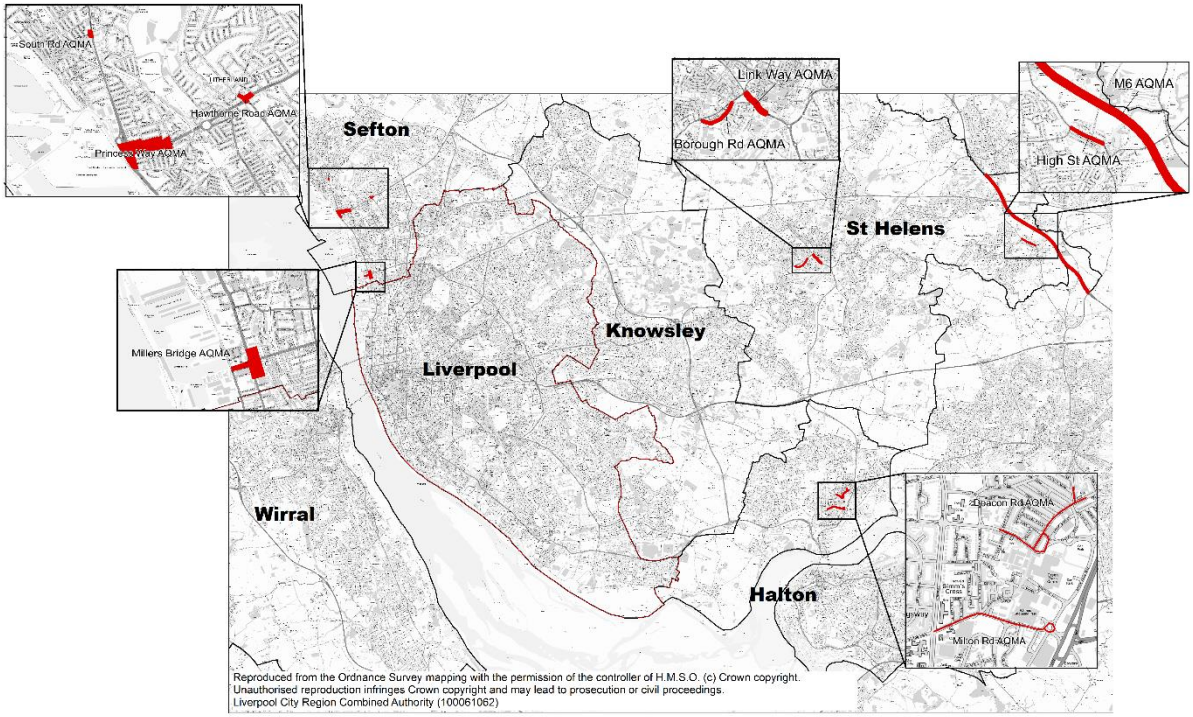


Sources: DfT Transport Decarbonisation Plan (left), showing national GHG projections established by the plan; and TfN Decarbonisation Strategy (right), showing cumulative emissions under different scenarios compared to the trajectory needed to achieve the carbon budget.

In terms of addressing this issue, carbon pathways are important. The climate emergency is not just about reaching net zero, but there is a total 'carbon budget' available to that point. In its decarbonisation plan the DfT suggests what this may look like, and likewise TfN theorises a range of futures. In all this work it is clear that – under the given baseline assumptions – transport does not fully reach net zero, and hence additional interventions will be required. LCR CA has commissioned a range of future travel demand scenarios, taking into account different levels of growth in the LCR economy, in order to understand what the likely scale of change may be in emissions. These scenarios are presented in detail in Section 7.

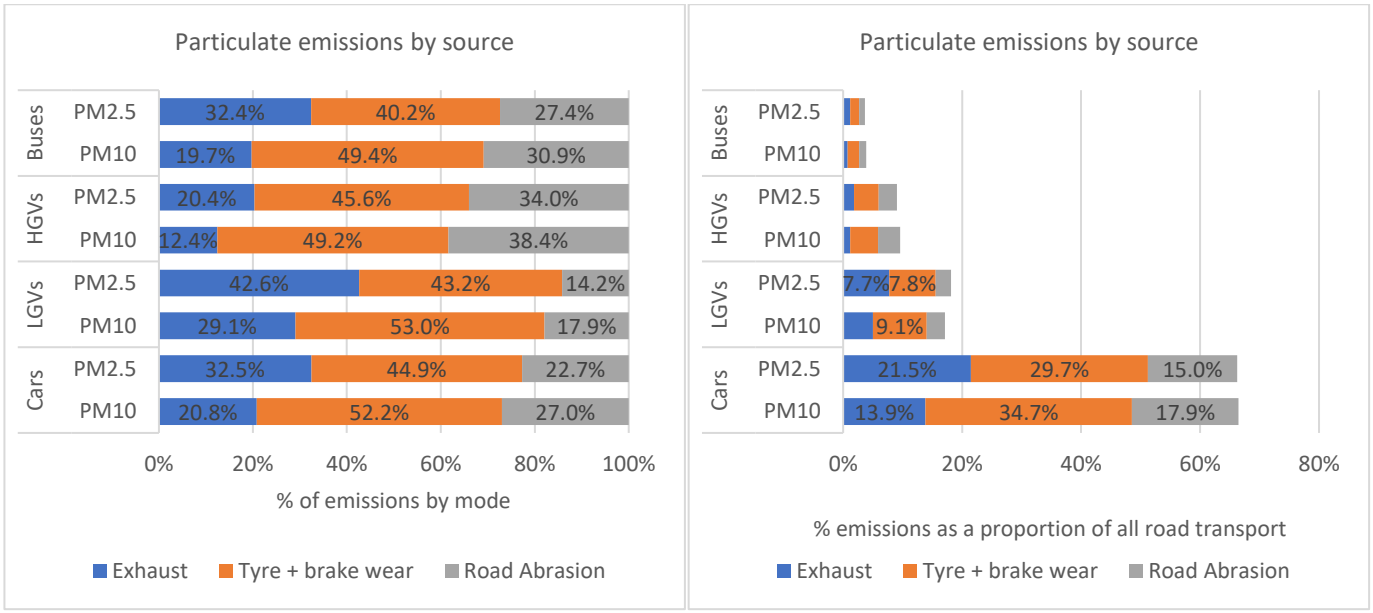
Although the need to reach net zero is a core aim for this Local Transport Plan, a parallel issue is that of other emissions connected to transport besides Greenhouse Gases. Of concern here may be particulates such as PM10s and PM2.5s, which can have particularly negative impacts on human health. Such pollutants can raise the need for an air quality management area (AQMA) to be implemented once they exceed certain levels, and indeed, a number of areas within Liverpool City Region have an AQMA – including the whole of the Liverpool Local Authority area.

AQMAs in the Liverpool City Region



A key point from the data – as the charts below show – is that when it comes to particulate emissions, a majority of these are not from a vehicle's exhaust. So, for example, just 20.8% of PM10 car emissions come from the tailpipe. The chart below on the right converts this into a proportion of all road transport emissions for each particulate and is weighted to reflect traffic mileage in the Liverpool City Region. Clearly all types of road transport raise this issue, but car traffic is very much the current dominant factor. Thus, the issue is not wholly solved by converting an internal combustion engine fleet to electric or hydrogen vehicles; mode shift becomes more relevant.

Particulate emissions from transport



Source: Air pollutant emissions by transport mode, DfT

Much of this whole narrative presents emissions at a net-LCR level, but in reality, there is also a spatial element to the issue.

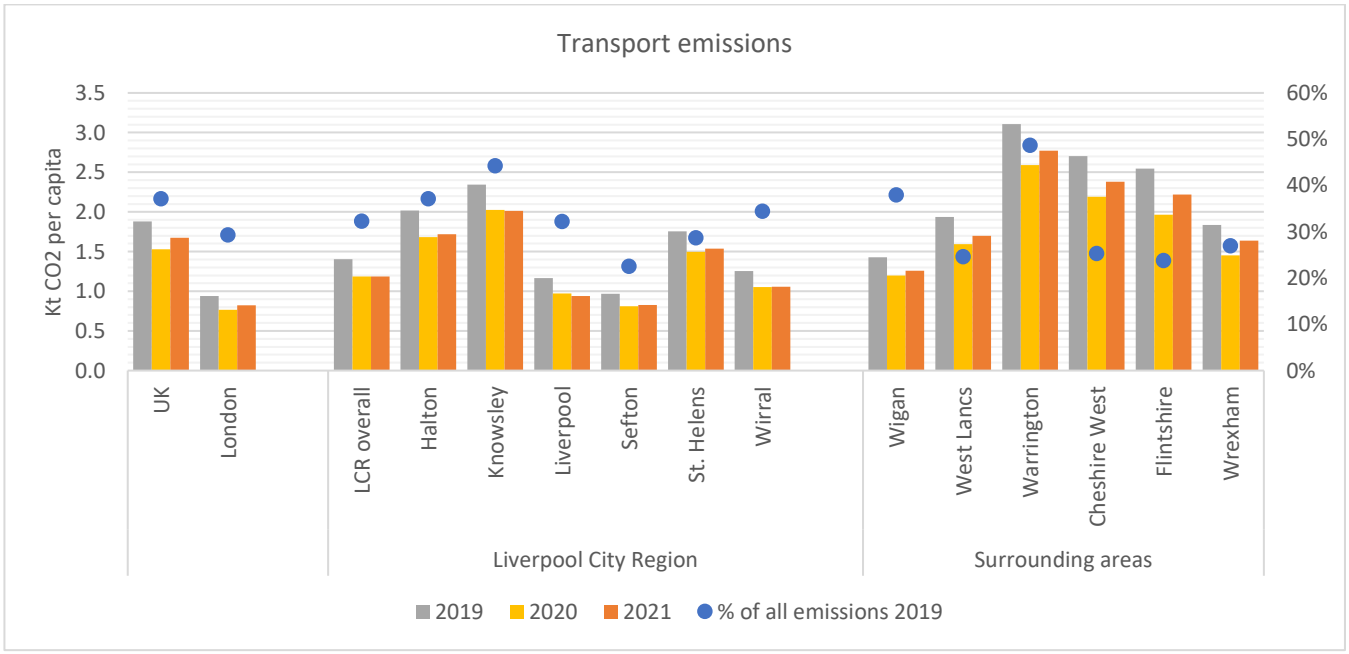
For example:

- Transport emissions were low in Liverpool itself (1.3kt CO2 per capita in 2019), which may reflect – as indicated later in Section 5 – on both the lower levels of car ownership and higher bus use.
- Emission levels were also low in Sefton and Wirral (1.1kt and 1.4kt respectively), which may partially reflect on the travel options afforded by the Merseyrail Electrics network.
- Levels of transport emissions per person were higher in other parts of the City Region (Knowsley 2.6kt per capita, Halton 2.1kt, and St.Helens 1.8Kt). Although potentially connected to the lower levels of public transport connectivity observed in these areas (Section 8) this is also possibly linked to freight activities (Section 9).

No part of the Liverpool City Region falls below the transport emission levels seen in London (1.0kt per capita), although this should be seen both in terms both of the capital's more comprehensive public transport network and its congestion zone charge (see Section 6 for mode share comparisons).

'No area is an island' is a recurring theme in transport data. Looking further afield from the Liverpool City Region, many of the surrounding local authority areas have transport emissions that are higher than the city region average (highest in Warrington, Cheshire West and Flintshire). Given the volume of flows to and from the city region from these areas (for instance, in terms of commuting, as evidenced in Section 6) this shows the importance of considering 'cross-border' journeys in the Local Transport Plan.

Transport CO2 by Local Authority

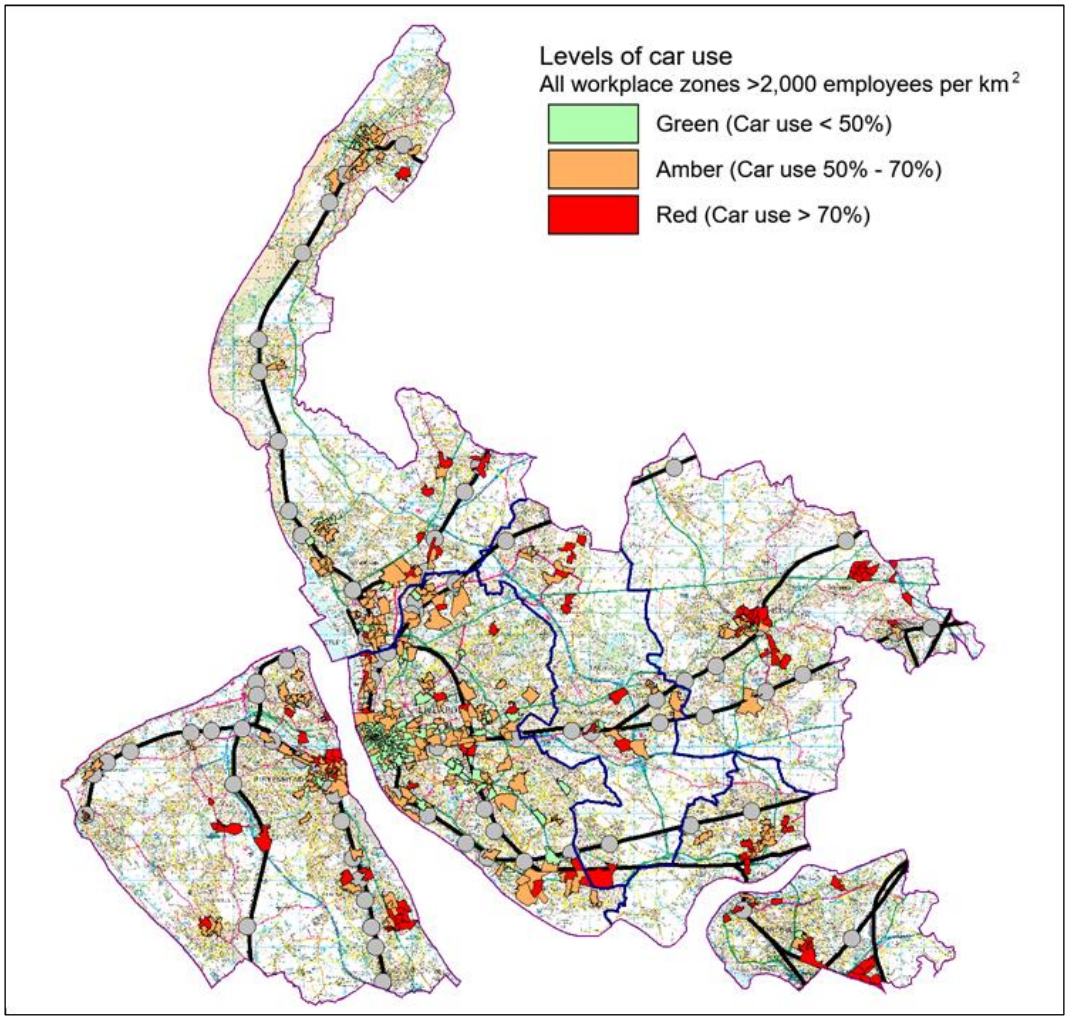


Source: UK national / UK local authority and regional greenhouse gas emissions national statistics, BEIS; measures in KtCO2(e)

In identifying how emissions might be reduced, it is important to provide a much deeper spatial analysis. The accompanying map shows where pockets of workplaces with particularly high levels of car use are likely to exist. There will be a number of factors behind this, but again weaker public

transport connectivity shows a strong correlation with many of these areas, and the data in this section should be analysed in conjunction with the connectivity data presented in Section 8. A clear indicator is that whilst Liverpool City Centre appears to perform better in terms of lower car use, there are many areas of concentrated car use elsewhere. And as cautioned elsewhere, commuting is not the only source of trip generation to be considered – with leisure in particular driving demand, especially in post-COVID travel behaviours.

Car use to workplaces and workplace concentrations



Source: Census 2011 and BRES 2010 to 2020; ONS

The evidence overall in this section suggests a challenge both in the need to reduce carbon but also other emissions. Road transport – and specifically cars – form the single biggest component but is not the only issue. Clearly some geographies pose different questions in how this can be tackled, and understanding the drivers of demand are important. At the same time, journeys not just within but to/from the City Region must be considered. Likewise, at the same time any solutions must enable the city region to tackle the many socio-economic issues it faces (Section 4).

Section 4. Socio-Economic Issues faced by Liverpool City Region

Within this section key aspects of the city region economy are explored, with specific focus on the sectors, gaps and challenges in a number of themes. Although a sizeable economic area – with an economically important hinterland – there are a number of challenges, a number of which transport can help through its enabling role.

4.1 Overview of the economy

Liverpool City Region produces £34bn of GVA annually, 2% of national GVA.

Liverpool itself is the largest economic centre of the City Region, contributing 40% of jobs and 41% of GVA. It is the commercial, cultural and transport hub of the region, with a strong public sector, thriving visitor economy, and growing ICT and professional sectors. The other local authority areas provide complementary strengths, including chemicals, science and technology in Halton, automotive manufacturing in Knowsley, transport and logistics in St.Helens, and health and public admin and culture in Sefton and Wirral. The combination of these areas, each with distinct strengths, will continue to create a diverse City Region economy that offers more than the sum of its parts.

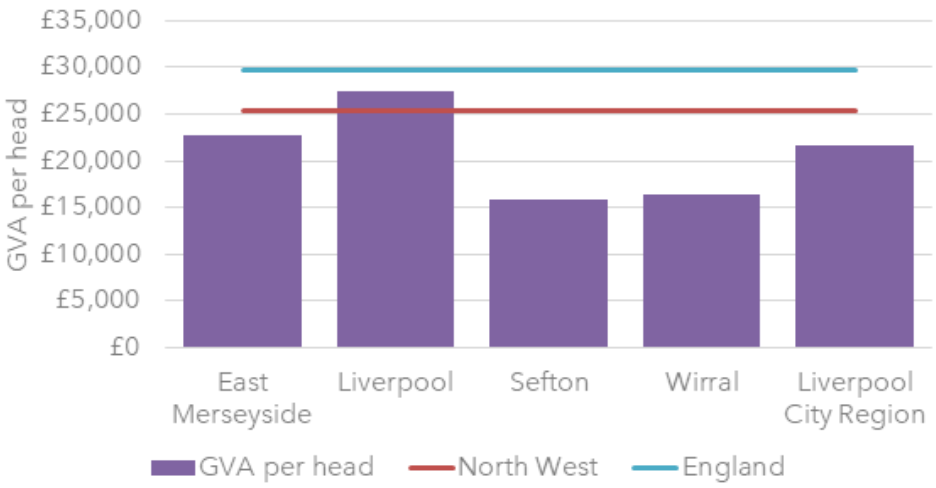
It is also worth being aware of the hinterland of the city region, including West Lancashire, Warrington, Cheshire West and Chester, and North East Wales. These particularly include elements of manufacturing, the service sectors and logistics, all of which have strong linkages to the city region, including commuting effects.

4.2 Economic Gaps

The LCR economy faces persistent income gaps with national averages

Per head of population, the LCR economy produces around £20,000 of GVA. This compares to around £30,000 nationally, representing a 29% shortfall.

GVA per head, 2020



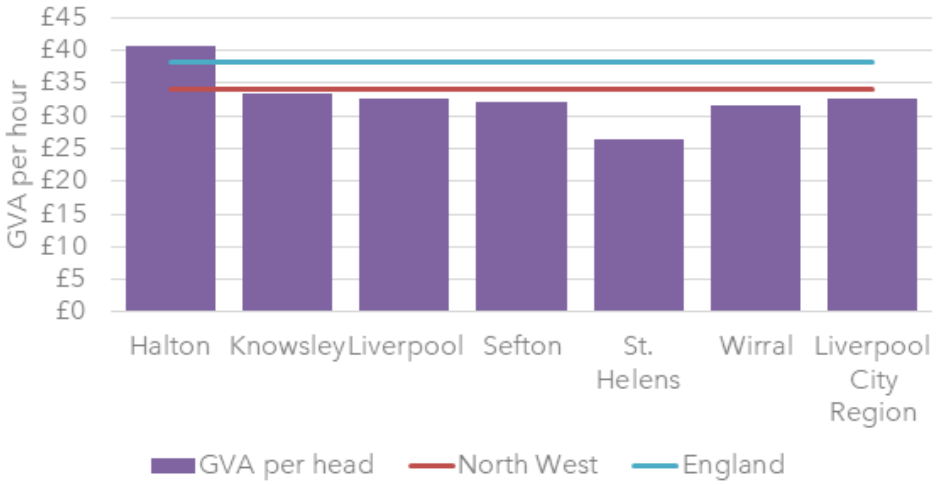
Source: ONS Regional GVA, 2020; ONS Mid-Year Population Estimates, 2020

This prosperity gap is partly driven by the relatively low density of jobs and businesses in the Liverpool City Region. LCR has the seventh lowest employment density and fourth lowest business density out of all LEPs. This represents 6,600 jobs and 550 businesses per 10,000 working age residents, compared to 7,700 and 790 nationally. While these lower levels of activity contribute to poorer economic performance, they also represent a significant opportunity for growth. Supporting more of Liverpool City Region's inactive residents into work can lead to significant improvements in its economic performance. In fact, if the LCR economy, matched national job density levels, its income gap would be an estimated 40% smaller.

Despite some clusters of high productivity activity, Liverpool City Region also faces productivity gaps with national averages

LCR is home to a number of high value and growing sectors, particularly in advanced manufacturing, science and ICT. However, the amount of GVA produced per hour worked in LCR remains below the national average. Per hour worked, the LCR economy produces £32.60,4 a 13% shortfall on the national level of £38.30.

GVA per hour worked, 2020



Source: ONS Subregional Productivity, 2020

LCR's poor productivity performance reflects both its sectoral composition, with a relatively high prevalence of lower productivity sectors, and poor within-sector productivity. However, analysis shows that productivity within individual sectors matters more. If LCR's sectoral structure (measured by each sector's share of total jobs) was the same as the England average, LCR's GVA per job would increase by 6% and the gap to national levels would close from 18% to 13%. On the other hand, if LCR retained the same sectoral structure as it has now, but increased productivity in each sector to the England average, then GVA per job would increase by 16%, closing the gap to national levels to 5%. This demonstrates the importance of improving productivity across all sectors of the economy.

LCR has seen widening income and productivity gaps over the past decade

After accounting for inflation, both output per head and output per hour decreased in the Liverpool City Region between 2010 and 2020. Both fell by 1% in LCR, while increasing by 10% and 7% respectively at the national level. This partly reflects the impact of Covid (real output per head grew

by 9% in LCR between 2010 and 2020), but also points to a period of slow economic growth where many other city regions have overtaken LCR.

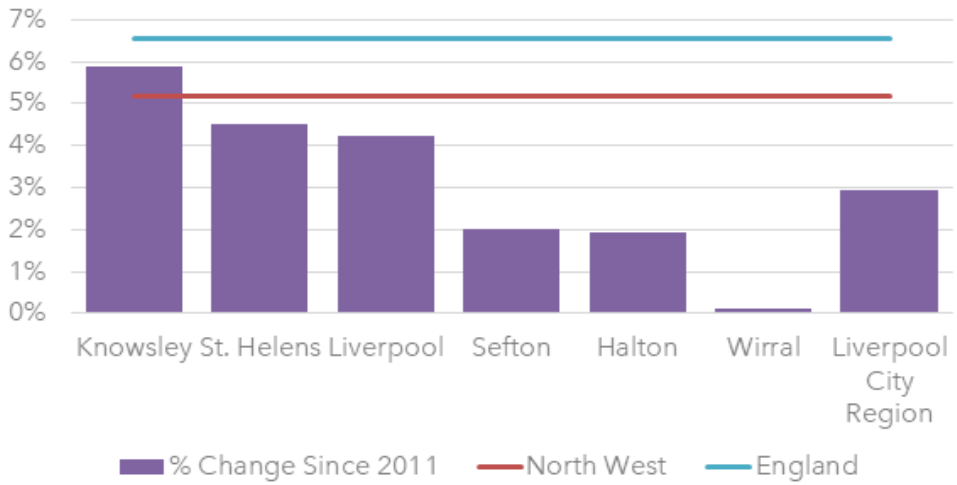
National population growth has outstripped that of LCR

As of 2021, the Liverpool City Region population stood at around 1.55m residents, of which around 1m (64%) are aged between 15 and 64 (an approximation of the working age population). As a proportion of the total population, LCR has a larger than average share of working age residents.

The total population in LCR grew by 3% between 2011 and 2021. However, this was slower than the growth seen across the North West (5%) and England (7%).

The population growth seen in the past decade was driven by a growing older population. In the period between 2011 and 2021, the over 65 population grew by 16%, while the working age population fell slightly. As a proportion of the total population, the share aged 15 to 64 fell from 66% to 64% between 2011 and 2021. This trend is forecast to continue.

Change in population, 2011 - 2021



Source: ONS Census 2011, 2021

4.3 R&D in the Liverpool City Region

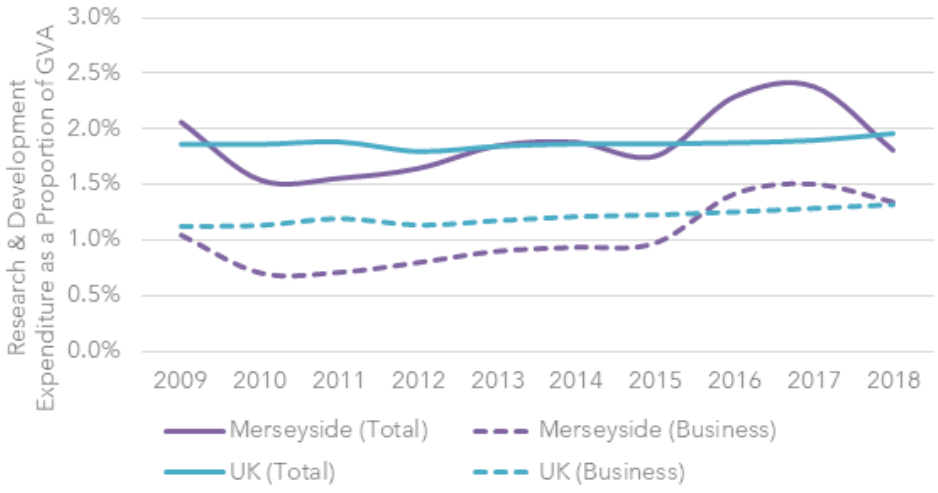
R&D and innovation can drive sustainable, transformational growth, both locally and nationally

Building on its innovation assets and the globally significant areas of research excellence in its universities, Liverpool City Region has the potential to drive sustainable transformational growth through research, development and innovation. The Liverpool School of Tropical Medicine (LSTM) generates ten times more research income per FTE academic than Oxford and Cambridge, while our other higher education institutions have distinctive smart specialisms in which they undertake pioneering research. These include chemistry and materials at University of Liverpool, and sport science at Liverpool John Moores University, whilst there is also the pandemic institute. LCR has two nationally significant knowledge clusters, while the Materials Innovation Factory, STFC Hartree Centre, Unilever's global R&D headquarters, and LSTM are truly world class assets. LCR also

neighbours Cheshire & Warrington another area with a strong track record in research and development.

Innovation and R&D are fundamental to the Government's Recovery Strategy. The Government has set a target for national R&D expenditure to reach 2.4% of GDP by 2027. LCR met this target in 2017 and, despite a drop in R&D expenditure in 2018, is well placed to make a significant contribution to achieving this objective. This reflects both LCR's clear potential, as well as the fact that, given the unequal R&D landscape across the country, other regions will need to significantly overperform in order to achieve the national target.

R&D expenditure as a proportion of GVA, 2009 - 2018



Source: Eurostat Intramural R&D Expenditure, 2009 - 2018

Achieving further R&D-led growth will require a significant increase in business expenditure on research and development. As of 2018, this stood at 1.3% of GVA, representing a large increase in both total quantity and share of total expenditure over the last decade. In order to achieve greater business R&D expenditure, LCR will need a greater number of knowledge intensive businesses. However, as of 2021, only 24% of LCR's business base was made up of knowledge intensive businesses, which compares to 28% nationally. Supporting the formation, growth and investment of these businesses will support LCR's economy to become more productive and innovative.

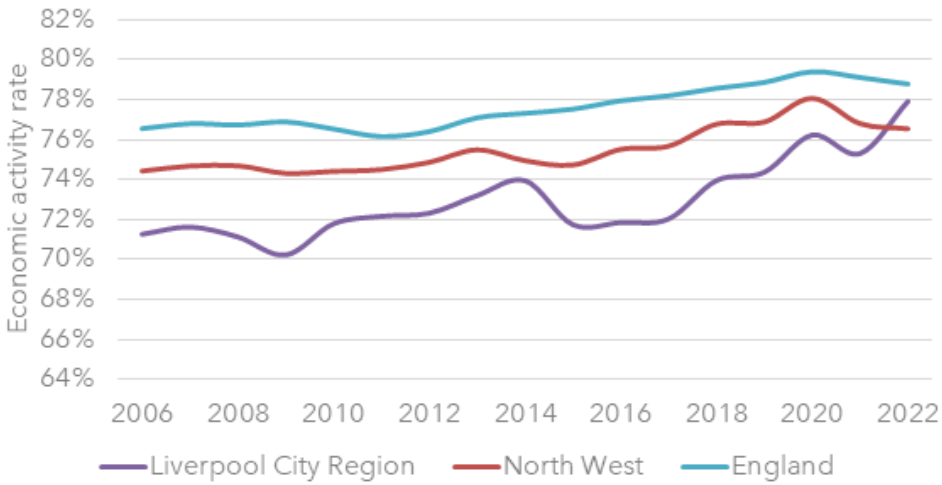
4.4 Employment change

Despite the Covid-19 pandemic, LCR's labour market has made significant progress

Over the past decade, the LCR labour force underwent a shift, with LCR residents now increasingly more likely to be in employment and less likely to be in economic inactivity or unemployment. Between 2012 and 2022, the proportion of residents economically inactive fell from 28% to 22%, and the employment rate rose from 65% to 75%.

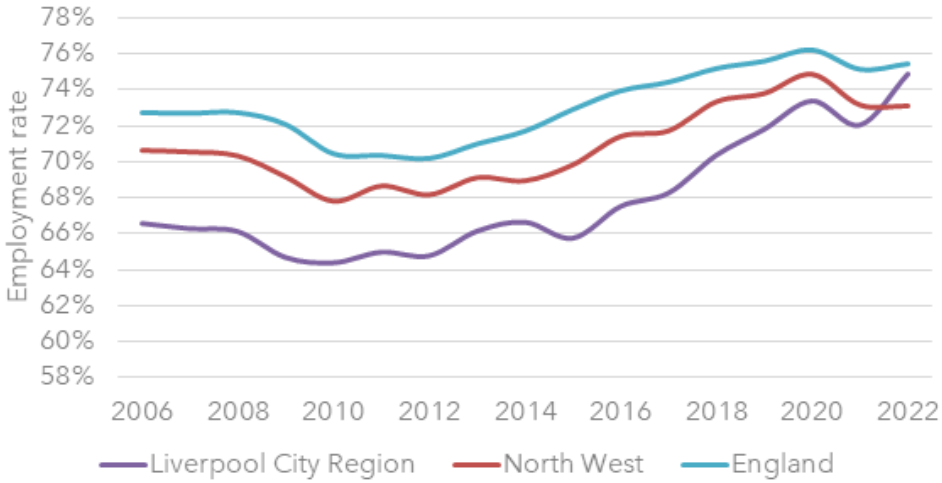
On both indicators, LCR now performs better than the regional average. However, some gaps with national averages remain, where the employment and economic inactivity rates stand at 75% and 21% respectively. Further increases in employment can contribute to significant improvements in economic performance.

Economic activity rate, 2006 - 2022



Source: ONS Annual Population Survey, 2006 – 2022

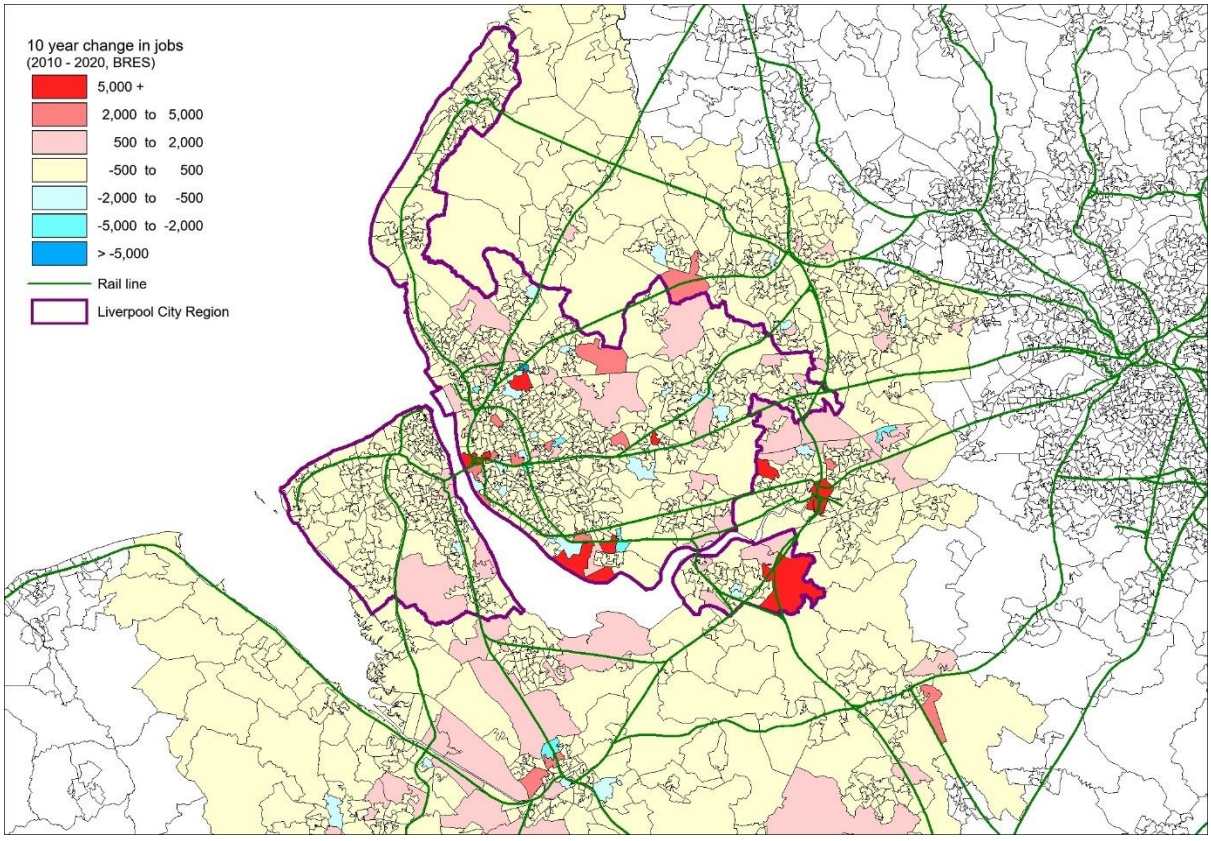
Employment rate, 2006 - 2022



Source: ONS Annual Population Survey, 2006 - 2022

In employment it is also important to be aware of spatial change – data from BRES suggests that in LCR there been a number of areas with significant increases in jobs (pre-COVID). This included within the city region Liverpool City Centre, Speke and Daresbury; whilst in the hinterland there have been significant increases in jobs in Warrington and the outskirts of Chester. From a transport perspective it is important to be aware of and react to these changes in order to meet demand, but also to understand if any areas are losing jobs whether transport can help reduce this – something that may be particularly relevant in terms of retail and leisure destinations.

10-year change in employment locations



Source: BRES 2010 to 2020, Nomisweb

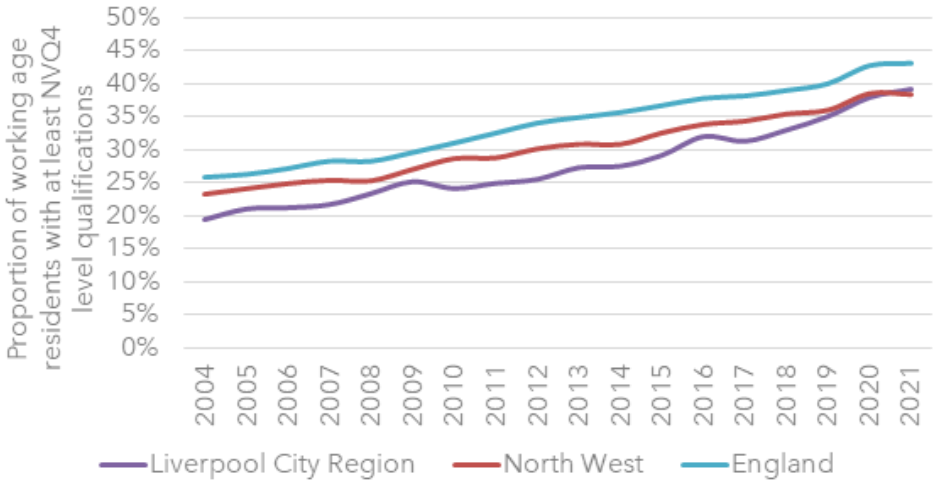
4.5 Skills

While qualifications and skills gaps have closed partially, there is still more work to be done

Recent years have seen a significant improvement in LCR's qualifications profile. Since 2004, the number of people with no qualifications has more than halved, while LCR has seen the second fastest growth in the number of residents with at least degree level qualifications.

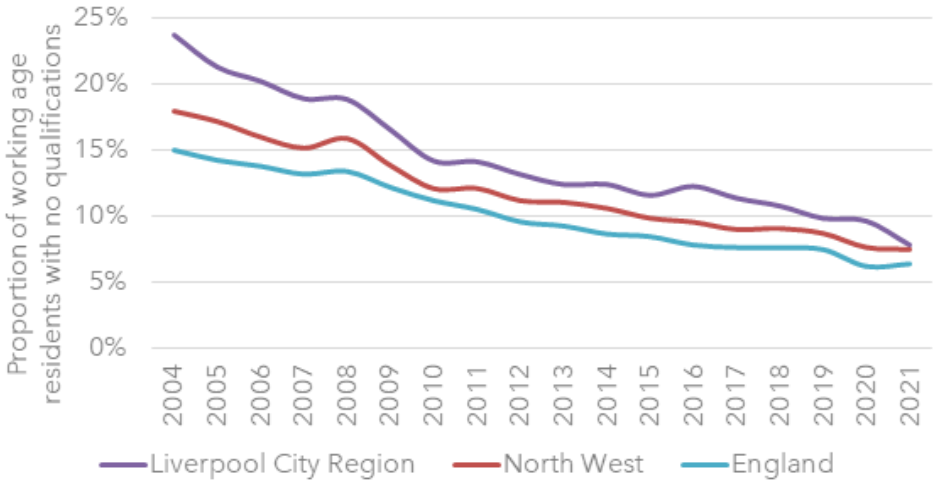
However, while gaps have closed partially, there is still more work to be done. Liverpool City Region still has a high proportion of residents with no qualifications, 8% compared to 6% nationally, and a low proportion of residents with at least degree level qualifications, 39% compared to 43% nationally. These gaps point to a less flexible labour market that acts as a drag on economic performance. Those with low or no qualifications are more likely to be economically inactive, while the relative lack of highly qualified workers, can lead to skills shortages among higher productivity firms.

Proportion of working age residents with at least NVQ4 level qualifications, 2004 - 2022



Source: ONS Annual Population Survey, 2004 – 2022

Proportion of working age residents with no qualifications, 2004 - 2022



Source: ONS Annual Population Survey, 2004 - 2022

The high number of residents with no or low qualifications is a longstanding challenge. This starts with poor educational attainment, with 62% of LCR pupils achieving grades 4 or above in English and Maths GCSEs, compared to 65% of pupils nationally. The same attainment figure falls to 41% in Knowsley. This leads to a high proportion of young people not in employment, education or training (NEET). As of 2020, 6.1% of 16–17-year-olds in LCR were NEET compared to 5.5% nationally.

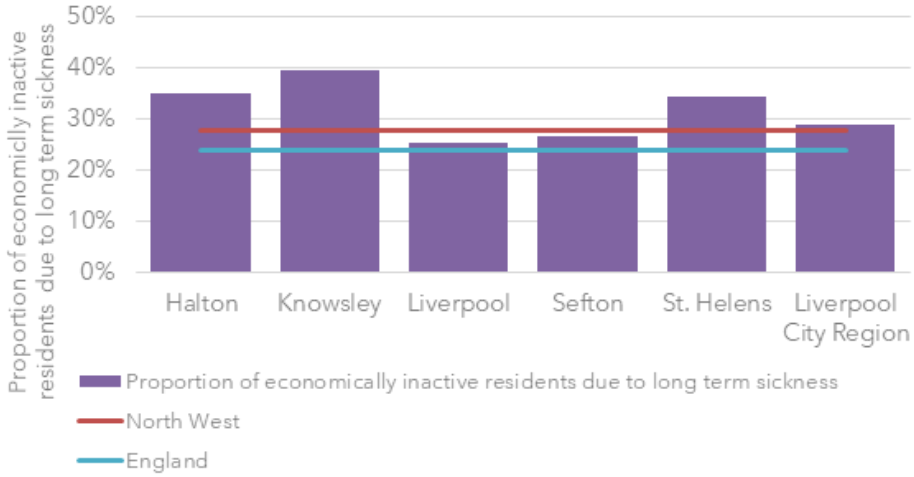
4.6 Health and Deprivation

For many residents, poor health acts as a barrier to participating in the labour market and accessing opportunities

Poor health and work-limiting illness & disability are common, with almost half of our neighbourhoods in the top 10% most deprived nationally, in terms of health deprivation and disability. This translates into 29% of LCR's economically inactive residents reporting that it was due to long-term sickness, this is the eighth highest share of all LEPs. The high prevalence of illness

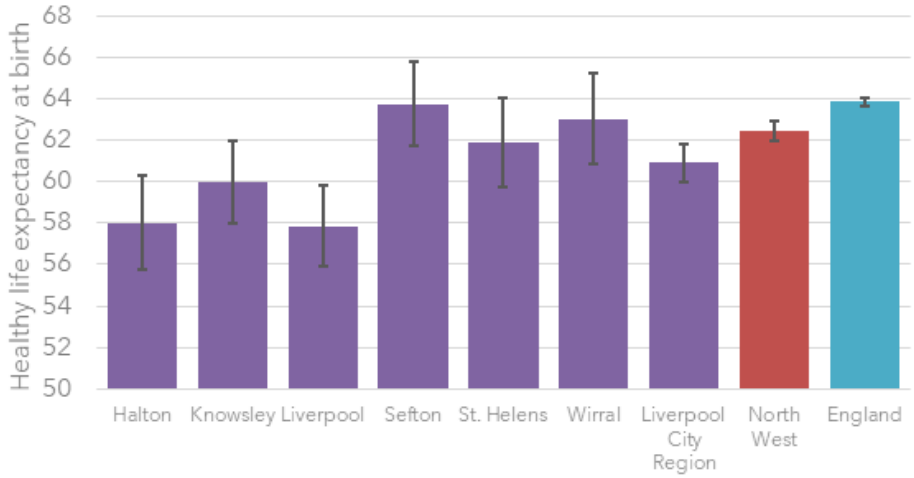
clearly has a negative impact on LCR's residents' quality of life; they are expected to live three years less of healthy life than the national average.

Proportion of economically inactive residents due to long term sickness, 2022



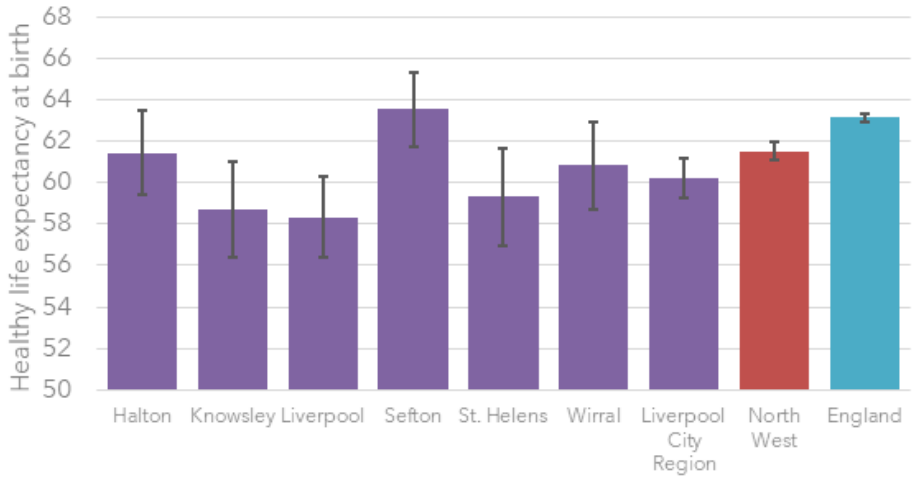
Source: ONS Annual Population Survey, 2022

Healthy life expectancy at birth by area for females, 2018 - 2020



Source: Health state life expectancy, all ages, UK, ONS, 2022

Healthy life expectancy at birth by area for males, 2018 - 2020

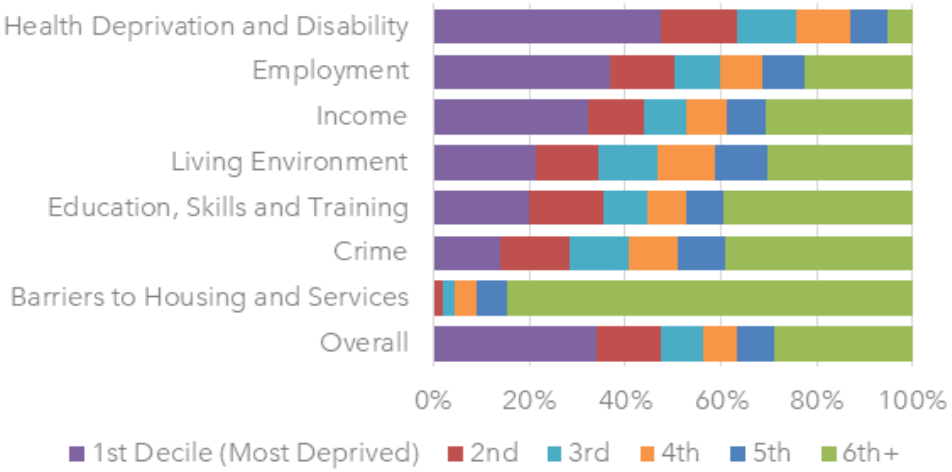


Source: Health state life expectancy, all ages, UK, ONS, 2022

Many LCR communities face entrenched and widespread deprivation

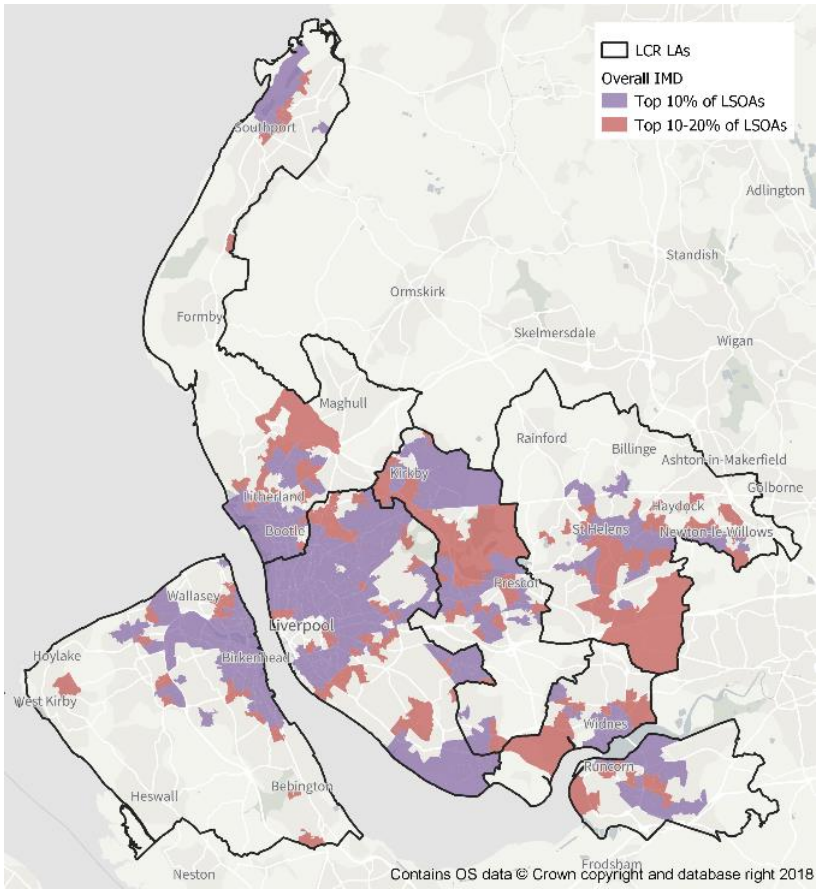
Many parts of LCR are characterised by significant deprivation. Almost half of the City Region's neighbourhoods are in the top 20% most deprived nationally, while around a third are in the top 10% most deprived. There is a particular concentration of deprivation running from east Wirral, through north Liverpool and south Sefton, to north Knowsley.

Proportion of LCR neighbourhoods by Indices of Multiple Deprivation domain deciles, 2019



Source: MHCLG English Indices of Multiple Deprivation, 2019

LSOAs in the 20% most deprived nationally (overall IMD), 2019



Source: MHCLG English Indices of Multiple Deprivation, 2019

LCR's neighbourhoods experience a high prevalence of deprivation across all domains, with the exception of barriers to housing and services. There are particularly high levels of health and employment deprivation, emphasised by LCR's low employment rate, high proportion of residents that are economically inactive due to sickness, and a high proportion of residents with no qualifications.

The complex relationship between these domains of deprivation mean residents cannot access opportunities and fulfil their potential. Enabling LCR's residents to overcome these challenges and make a greater economic contribution represents a significant opportunity.

4.7 Population

The Liverpool City Region population has grown at a slower rate than national average.

In 2021, the LCR population stood at 1.55m. In the 10 years to 2021, LCR saw a 44,800 (or 3%) increase in its total population. However, this is a slower growth rate than the England average (7%) and many other combined authority areas.

Over the same period, the number of LCR residents aged 16 to 64 fell by 1,300 (<1% change). This compares to the 4% growth seen nationally. In 2021, the LCR population aged 16 to 64 stood at 979,000.

Forecasts show the LCR population is projected to grow slowly.

Baseline forecasts by Oxford Economics suggest that the LCR population will grow by 0.8% between 2020 and 2045, slower than the regional and national growth rates over the same period of 2.5% and 5.2% respectively.

Population growth in LCR is projected to be driven by older residents.

In 2019, those over 65 accounted for 19% of the population, but by 2045, they will account for 25%. This is similar to national trends, but there will be significant disparities across LCR, with Sefton reaching over 30%. Over the same period, the LCR population aged 16 to 64 is projected to decline by around 72,000 (7.4%), which compares to a 2.2% decline forecast nationally. This increase in the older population has distinct considerations for transport networks, in terms of accessibility, ticketing, and network provision.

4.8 Cost of living

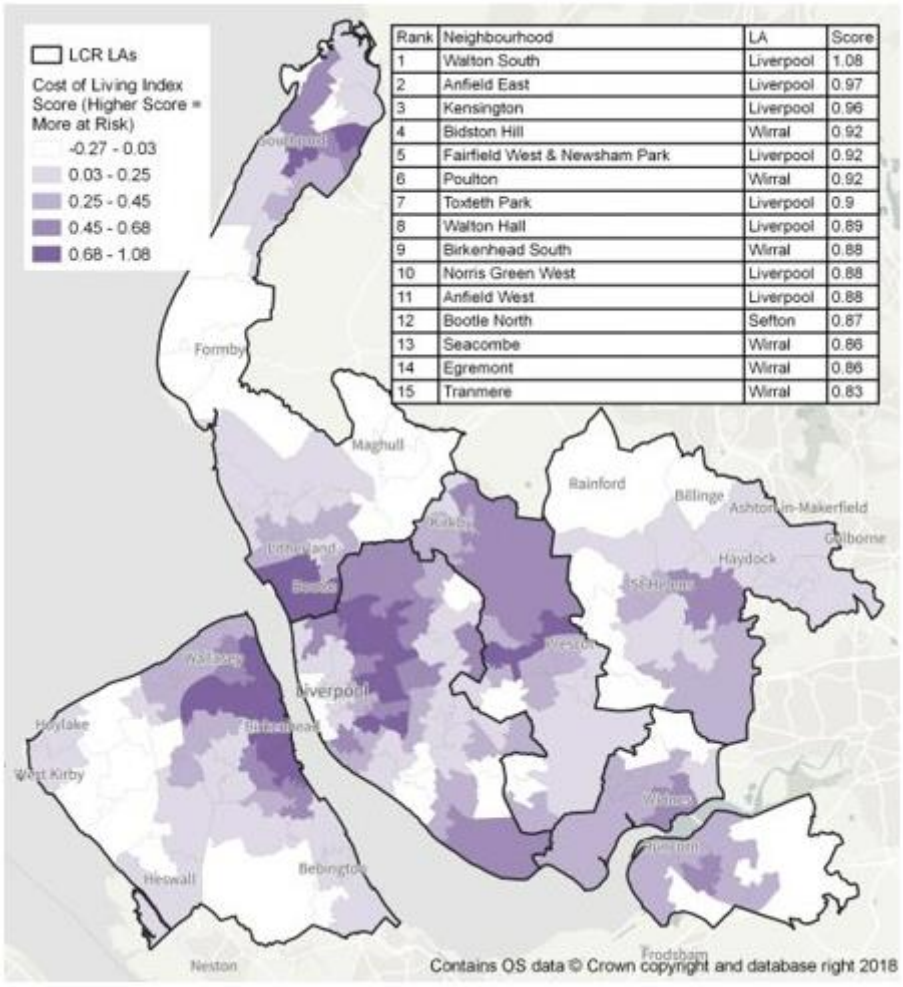
Inflation continues to rise and according to the Bank of England this is around the expected peak in inflation, with rates expected to fall sharply in 2023. The most significant contributors to this were housing and households services (primarily driven by the increase in energy prices) and food and non-alcoholic beverages. These two categories are responsible for over half of the current inflation rate.

Recent inflation has had an uneven impact on households. As poorer households spend a higher proportion of their total budget on gas and electricity, they are experiencing higher than average inflation. The ONS estimate that the poorest 10% of UK households experienced inflation of almost 13% in, compared to around 10% for the richest 10%. At the same time, poorer households have experienced slower wage growth. In the 12 months to September 2022, the poorest 10% of earners

saw wage growth of 3%, compared to 7% for the top 10% of earners. This represents a reduction in living standards for both groups, but it is particularly stark for lower earners.

Due to high levels of deprivation across the Liverpool City Region, the recent Cost of Living challenges are having an even greater impact on households and communities across the City Region. Analysis shows that the majority of neighbourhoods are more at risk from rising cost of living than the national average. There are particular risks around north Liverpool, south Sefton, east Wirral and north Knowsley.

Cost of Living Index Score (Higher score = more at risk)



Rank	Neighbourhood	LA	Score
1	Walton South	Liverpool	1.08
2	Anfield East	Liverpool	0.97
3	Kensington	Liverpool	0.96
4	Bidston Hill	Wirral	0.92
5	Fairfield West & Newsham Park	Liverpool	0.92
6	Poulton	Wirral	0.92
7	Toxteth Park	Liverpool	0.9
8	Walton Hall	Liverpool	0.89
9	Birkenhead South	Wirral	0.88
10	Norris Green West	Liverpool	0.88
11	Anfield West	Liverpool	0.88
12	Bootle North	Sefton	0.87
13	Seacombe	Wirral	0.86
14	Egremont	Wirral	0.86
15	Tranmere	Wirral	0.83

Source: LCRCA, Cost of Living Index

4.9 Opportunities supported by the LTP

The LTP will have a role to play in supporting economic growth, while providing more opportunities for business and job creation. The intervention can help address these challenges by:

- Unlocking land for future commercial and residential development
- Improving journey times for residents and businesses
- Improving access to employment for all residents
- Supporting priority sectors by connecting major assets (i.e. universities, airport, train stations) and businesses

- Ensuring growth of the visitor economy by tapping into new and existing markets, and ensuring those visitors can travel sustainably
- Improving access to housing sites
- Promoting active travel

The LTP can help to address some of these deep-rooted and long-standing socio-economic challenges, that the City Region faces. The interventions can help to address these challenges by:

- Improving access to education and health services
- Improving access to services and amenity
- Improving access to parks and green space
- Improving access to employment opportunities
- Supporting equal travel opportunities for all
- Providing more affordable travel

The LTP will also have a role to play in supporting LCR's global competitiveness while providing more opportunities for innovation and research and development. The intervention can help address these challenges by:

- Improved access to LCRs innovation assets, key employment locations and innovative businesses.
- An improved and well-functioning transport system helps support a vibrant business ecosystem comprising a diverse critical mass of R&D intensive firms.
- Improving active travel and reducing congestion will improve quality of place, helping to both retain and attract the skills required for LCR to achieve its innovation potential.
- Improved intra-city transport links to the rest of the North West, the North, and further afield will support greater collaboration between regions HEIs', innovation assets and new markets.
- Enhanced transport connectivity allowing residents to access education and skills will enable residents to access the new opportunities within high value employment.

This section has shown the key economic issues the Liverpool City Region faces, but also some of its strengths. It has shown where transport has a role to play – in enabling access to opportunity, in enabling movement of goods, and connecting further afield to bolster productivity. More recent issues such as COVID and the cost of living may have made these actions all the more vital if the city region is to transform its economy.

Section 5. Impacts of COVID 19

COVID-19 has had significant impacts on the Liverpool City Region as much as nationally. This has included direct impacts – such as shorter-term restrictions on the economy and movements – to longer term impacts including changes to the structure of the economy, working patterns and travel habits. This section provides an overview of impacts including on high-level transport demand, with more detail on travel patterns in successive sections.

5.1 Overall Impact on the Economy

It is estimated that the Liverpool City Region economy shrank by 10.2% in 2020, while UK output fell by 9.9%. This meant a large increase in the claimant count and a significant number of residents requiring either the Job Retention Scheme or Self-Employment Income Support Scheme, particularly in the sectors most affected by restrictions. This would include – among many other elements – the city region's visitor economy. Many of the issues the Liverpool City Region already faced may well have been exacerbated by the direct and indirect impacts of the pandemic.

However, LCR economic output is forecast to rebound relatively quickly, with forecast growth of 8.1% in 2021 and 6.8% in 2022. While a large proportion of economic activity and jobs will return following the easing of restrictions, it is likely that the recession will have a longer-term negative impact. It is estimated that the economic scarring will result in a permanent decrease to GVA of 1%.

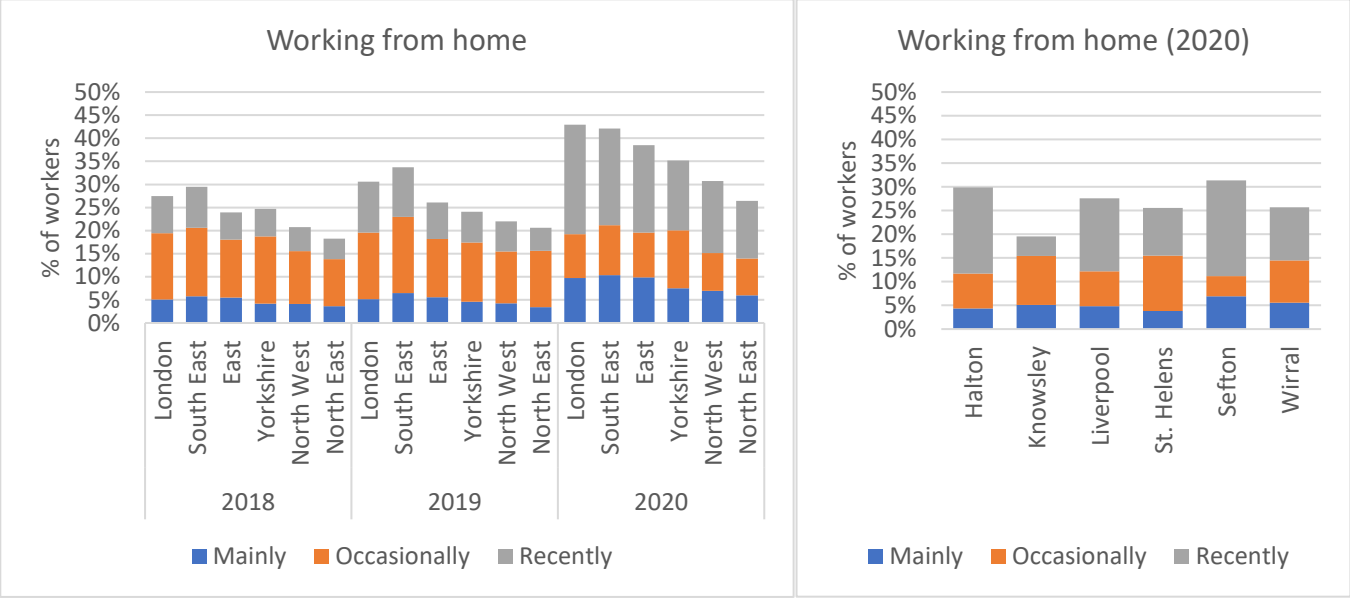
LCR's economic output is anticipated to grow at 1.3% per year between 2019 and 2045. This is slightly slower than national rates at 1.4%. The main growth sectors over the coming decades are expected to be professional services, health and social care and ICT, with a shift towards jobs with higher pay and greater qualification requirements. Conversely, the number of manufacturing jobs is forecast to decline by nearly 50%. However, those manufacturing jobs that remain will be higher skill and higher productivity.

5.2 Working from home

Working from home nationally become more prevalent during the periods of COVID restrictions, and there is uncertainty about how this may resolve longer term. Data shows how this increased, and although there is no data currently at finer levels of spatial detail, we can turn to a sample of regional data.

One thing clearly is that whilst across all geographies there was an increase in working from home this was less the case in Northern regions, possibly as a result of the industry mix in these areas meaning there was a lower proportion of jobs that could be done working from home.

Changes in Working From Home during COVID



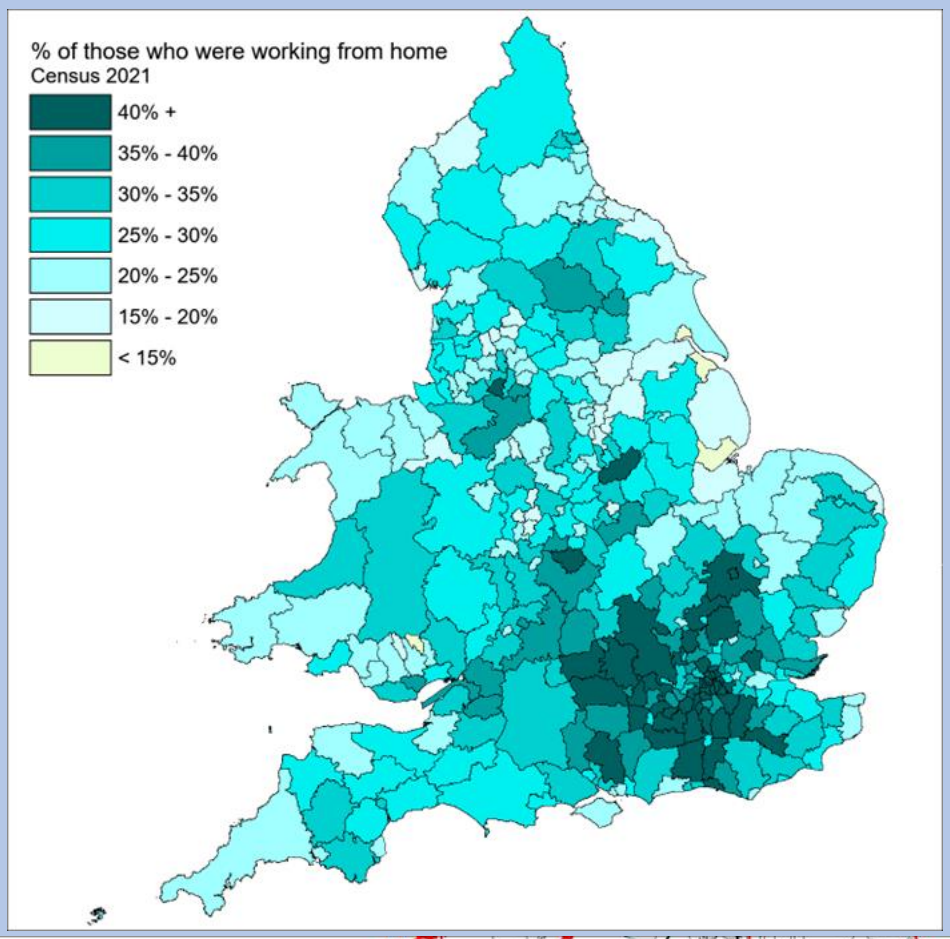
Source: Working from Home, ONS

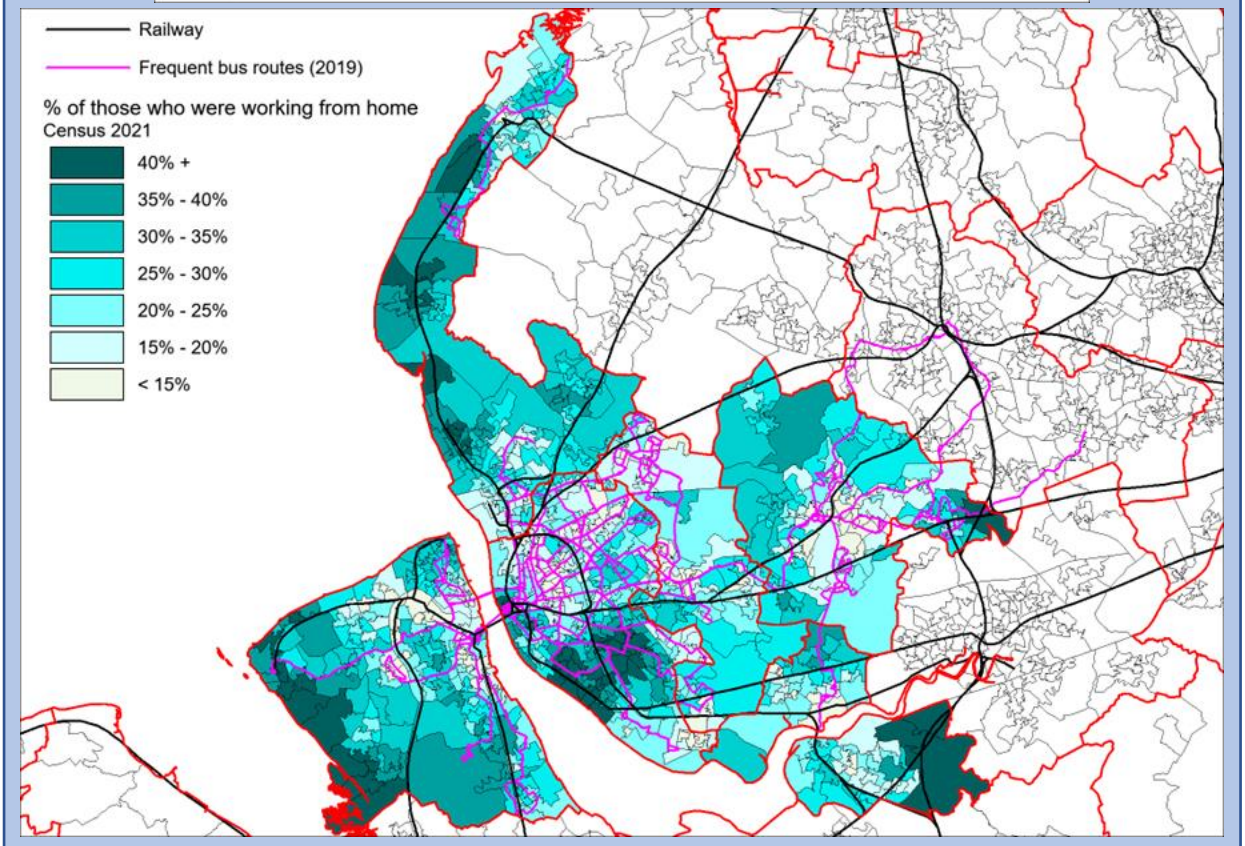
The Census 2021 data below provides a snapshot of the geographic variations in working from home. This represents a time[13] when there were some lockdown restrictions, but it was neither the strictest period nor that which might resemble the current situation. Still, it shows patterns across the Liverpool City Region which may be useful in understanding where working from home was higher – and lower, because as the mapping clearly shows there were many areas with minimal levels of working from home. A possible interpretation of this data could be the potential for those areas with high work from home as seeing lower future levels of commuting demand, although that needs to be considered as a scenario rather than definitive.

Note: a key point in all this reinforces the message that working from home patterns were stronger in London and the Southeast than in many other regions around the country.

[13] Census Day was on Sunday 21 March 2021

Census Day working from home splits; variance both nationally and within the City Region





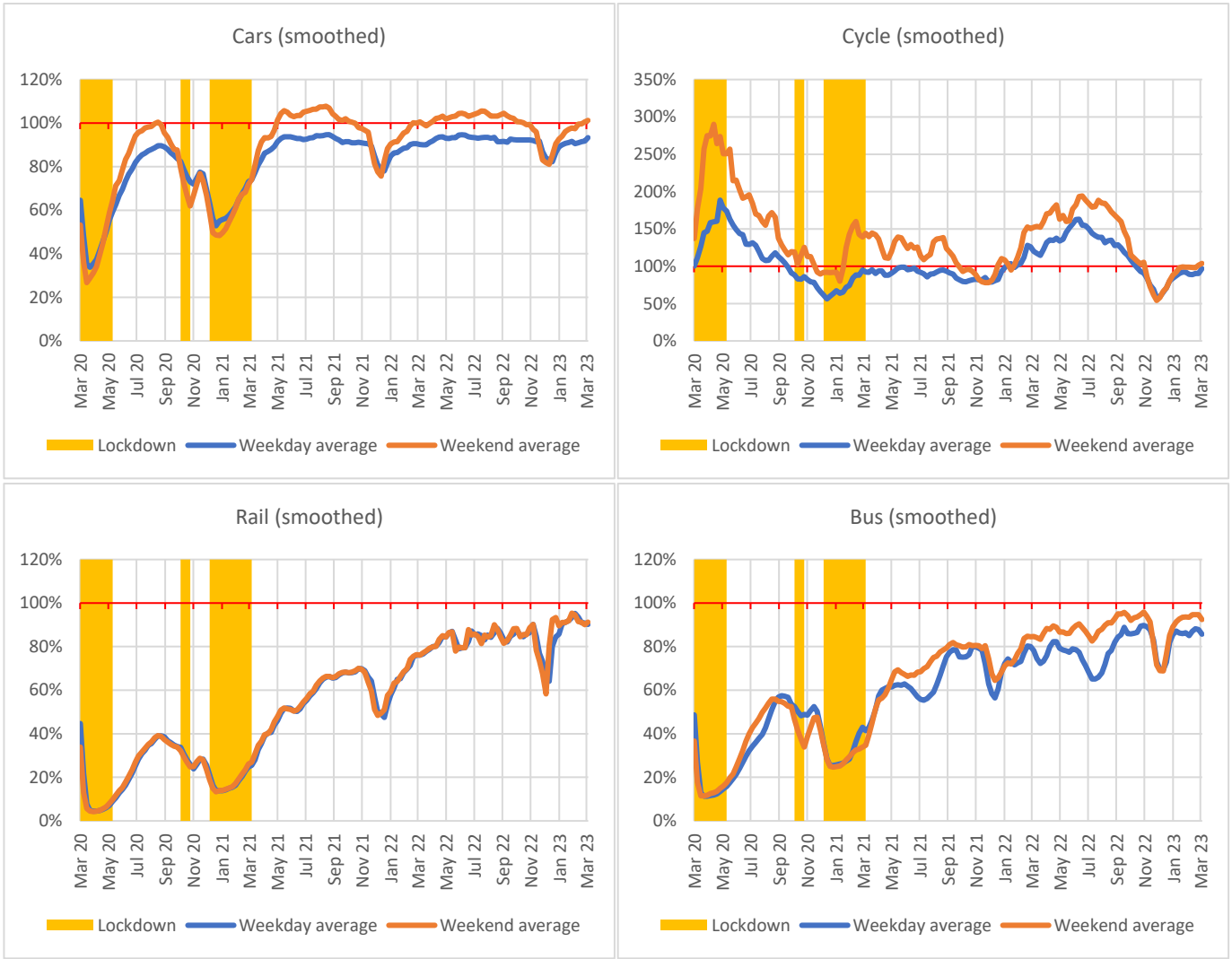
Source: Census 2021, ONS

5.3 Overall impact on transport demand

Both directly and indirectly COVID has impacted on transport demand. *Directly* through lockdown periods where movement was restricted; and *indirectly* through economic impacts, changes in working patterns, and lingering effects from Government campaigns advising against use of public transport. A significant risk has always been that of a 'car-based recovery', with the above factors resulting in increased use of cars rather than increased use of public transport and active travel, with all the environmental, social and economic issues this entails.

Nationally, lockdowns saw public transport use at its nadir drop to 5% (rail) and 12% (bus) of national levels, with the height of initial restriction seeing car use drop to 27%. By early 2023 rail use

COVID impacts on travel demand (national)



Source: LCR CA analysis of DfT Transport Use statistics
All figures are expressed as a % of transport use on a similar week pre-COVID

More detailed transport data is provided in Section 6, but here it is worth being aware of the high-level travel demand, as observed through Government data. Clearly, weekend demand for travel has returned stronger than pre-COVID; this is widely expected to be a reflection of increased leisure travel. Weekday travel has returned at up to 95% of pre-COVID levels. It is also noticeable that cycling activity has been a strong area of growth – although dropping down from the peaks seen during 2020, data for 2022 suggests somewhat higher levels than in 2021. Combined with data from

other sources, this seems to represent increased cycling for leisure – for its own sake – rather than replacing other modes for commuting or shopping, but of course this still delivers significant health benefits regardless of mode shift. Public transport has had a slower recovery. Initially, bus had a faster level of growth, but during 2022 rail regained a strong growth trend. The data trend suggests that unfortunately the industrial action over the past year has weakened this before it could reach pre-COVID volumes; longer term this may pose a risk in the need to reach net zero.

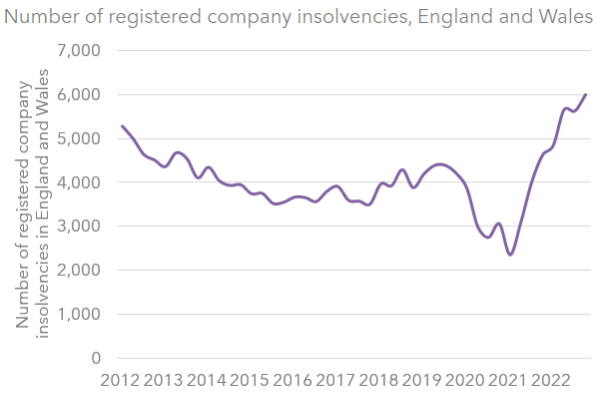
In all this data, be aware what is presented above is national level data and should be viewed (where possible) in the context of more local data. Certainly, such averages hide a number of individual elements; for example, with Liverpool Central rail station at times exceeding demand of pre-COVID levels.

With the fallout of Covid-19 and with recent inflation reaching its highest rate in 40 years, the Office for Budget Responsibility (OBR) is forecasting a 3.7% fall in real disposable household income in 2022/23, the largest fall since ONS records began in 1956/57. This is forecast to be followed by a 2.0% fall in 2023/24.

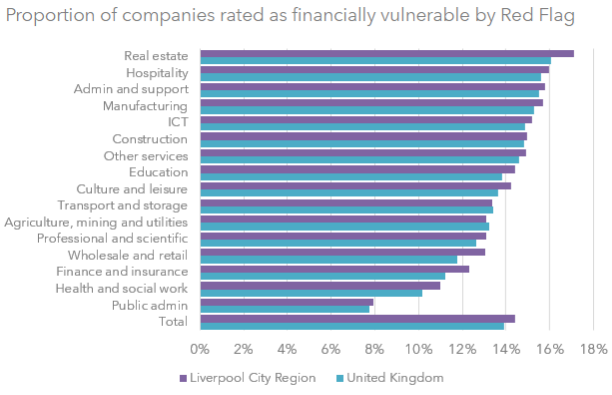
At the same time, consumer confidence is at historically low levels, with households' assessment of their own financial situation over the next 12 months dropping sharply since early 2022. Both of these indicators point to reduced consumer expenditure in the short-term.

Company insolvencies have rising sharply since the beginning of 2021. In 2022 Q4, there were 6,000 company insolvencies, up 30% since 2021 Q4 and 40% on the 2019 average. This is the highest quarterly level since 2009.

Red Flag Alert provides an assessment of the financial vulnerability of all registered companies. In February 2023, 14.5% of LCR companies were noted as financially vulnerable, compared to 14% across the UK. The sectors with the greatest share of financially vulnerable companies were real estate, hospitality, admin and manufacturing.



Source: The Insolvency Service Company Insolvency Statistics



Source: Red Flag Alert, 2023

Further analysis shows there were more business closures than business starts in LCR during 2022, with the net business birth rate dropping to -0.5% of active businesses in 2022 Q4 alone (-0.7% for the whole of 2022).

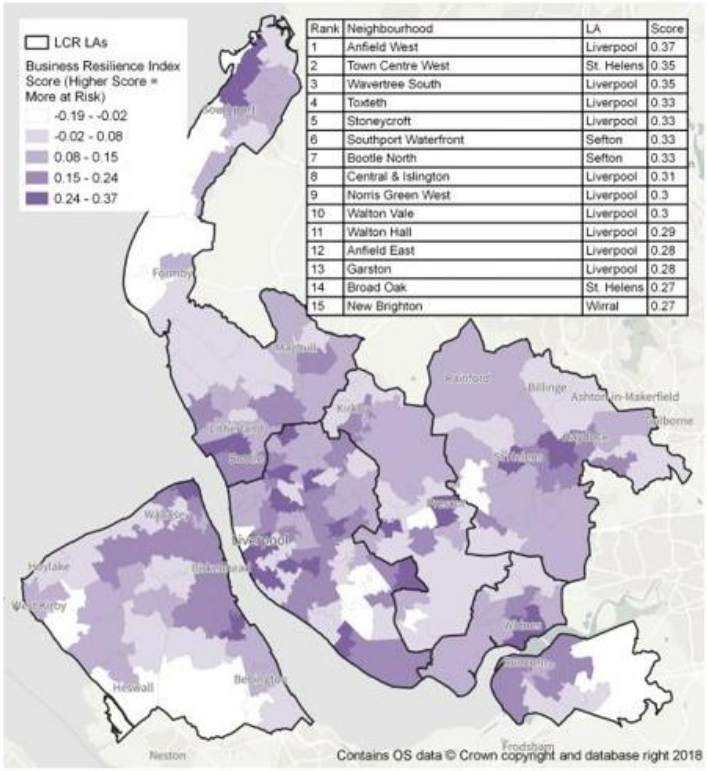
This was driven by both a slowdown in business births and an increase in business closures. Between 2021 and 2022, the business birth rate fell from 14.2% to 13.3%, while the business closure rate rose from 13.2% to 14%.

The LCRCA Business Vulnerability Index has shown that hospitality is consistently the most exposed sector across all indicators considered, followed by other services. Manufacturing businesses have particular concerns about supply chains and labour supply. Concerningly, LCR has a greater concentration of businesses in at-risk sectors than average. Hospitality, other services, manufacturing and retail all make up a greater share of LCR businesses than the national average.

Most LCR neighbourhoods have a greater than average concentration of businesses in the more at-risk sectors. Around 90% of LCR neighbourhoods have a positive Business Vulnerability Index score. This indicates we have a large number of neighbourhoods with a high concentration of businesses in more at-risk sectors.

Analysis shows that the majority of neighbourhoods have a greater than average concentration of businesses in the more at-risk sectors. The areas with the highest Index scores tend to be those with a high concentration of hospitality businesses. As expected, neighbourhoods in town or city centres or areas with high footfall have greater Index scores.

Business Vulnerability Index score



Rank	Neighbourhood	LA	Score
1	Anfield West	Liverpool	0.37
2	Town Centre West	St. Helens	0.35
3	Wavertree South	Liverpool	0.35
4	Toxteth	Liverpool	0.33
5	Stoneycroft	Liverpool	0.33
6	Southport Waterfront	Sefton	0.33
7	Bootle North	Sefton	0.33
8	Central & Islington	Liverpool	0.31
9	Norris Green West	Liverpool	0.3
10	Walton Vale	Liverpool	0.3
11	Walton Hall	Liverpool	0.29
12	Anfield East	Liverpool	0.28
13	Garston	Liverpool	0.28
14	Broad Oak	St. Helens	0.27
15	New Brighton	Wirral	0.27

Source: LCRCA Business Vulnerability Index

The sectors with the highest Business Vulnerability Index scores also tend to have faced the largest Covid-19 impacts. Hospitality, other services, and manufacturing all had higher than average take-up rates of the Coronavirus Job Retention Scheme.

At-risk sectors including hospitality, retail, other services, and transport also saw the largest fall in economic output between January 2020 and December 2021.

COVID-19 has had multiple direct and indirect impacts on the Liverpool City Region's economy, elevating the existing social, economic, and environmental challenges. Included in this is the risk of

a 'car-based recovery' suggested by recent trends. Transport's role as an enabler, including what can be delivered by more sustainable modes, is now an even more important consideration. Identifying the strengths and weaknesses of the Liverpool City Region's transport offer will help to understand the key issues.

Section 6. Transport data

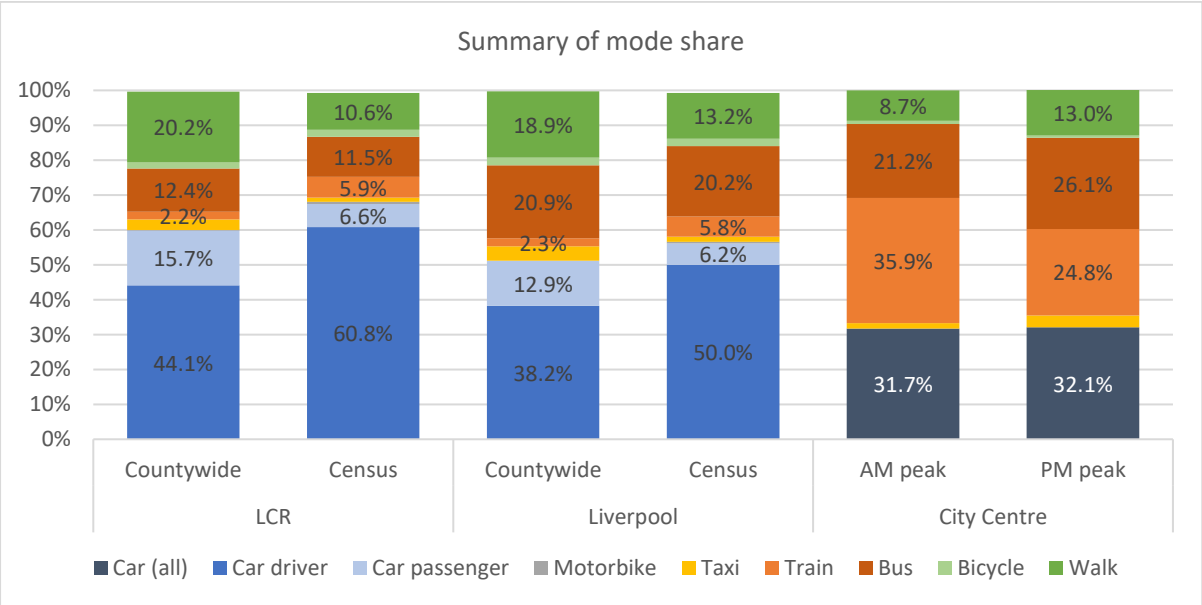
The Liverpool City Region already sees certain strengths and weaknesses in terms of its transport network. Some of these are particularly significant when we consider the socio-economic needs identified in Section 4, the importance of recovering from the impacts of COVID (Section 5), as well as the need to reduce carbon and other emissions (Section 3).

6.1 Mode share estimates

A key aspect in dealing with transport lies in understanding mode share. Unfortunately, here there is no one simple answer, as multiple data sources exist, each of which provides a view from a different perspective. All these sources need to be understood in order to gain a complete picture. The Liverpool City Region is working to have improved data sources to improve this picture, as referenced in the final section of this report, and this is likely to be established during the lifetime of this Local Transport Plan. The sources below are the key elements available and are compared with some being explored in further detail in this section.

- **Countywide survey** – a survey capturing typical weekday journeys in the Liverpool City Region, based on a sample of 200 households in each local authority.
  Excludes trips by non-residents.
- **Travel to work data** – coming from Census 2011, provides in detail mode share for those working and living in Liverpool City Region.
  Excludes non-work trips.
- **Mode share survey** – covers the AM peak and inter-peak on weekdays to track changes in mode share into key centres in the Liverpool City Region. Liverpool City Centre is surveyed annually, with seven other centres surveyed on alternate years.
- **Mode volumes** – a range of data sources exist from DfT and others to enable changes by mode to be monitored for the Liverpool City Region, including: car miles, bus passenger trips, rail journeys. However, the metrics and differing methodologies mean these should not be compared to establish mode share.

Mode share – more than one way of viewing the data



Sources: Countywide survey (2017) / Census (2011) / Mode Share (2018/19)

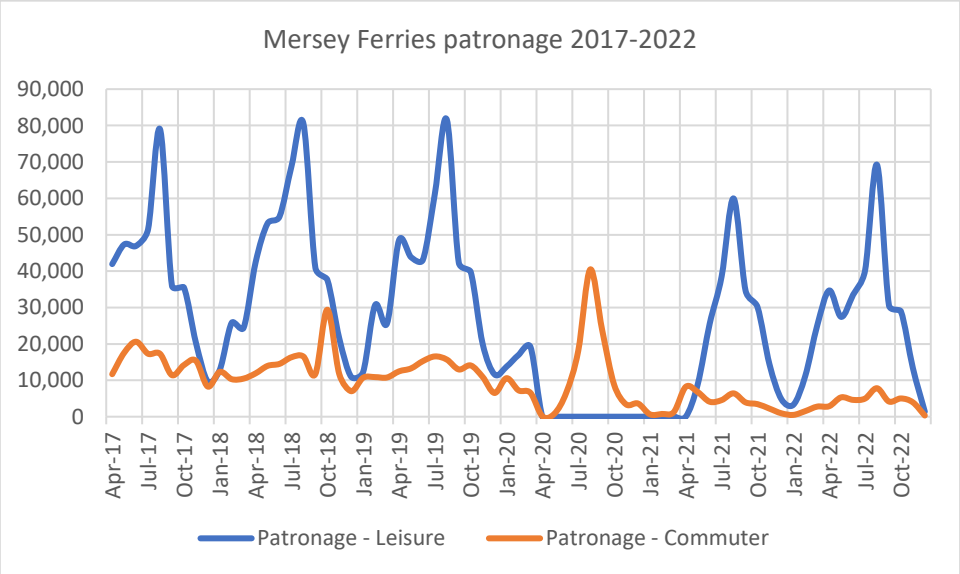
This clearly shows the strong variance depending on the perspective of the data, and also the importance of improving data sources. Still, there are a number of key messages from this for the Local Transport Plan, which are supported by the data presented elsewhere in this section.

- There is clearly a dominance of use of the car across the city region, although lower in Liverpool itself.
- Whilst a notable proportion of trips are made on foot, there does appear to be potential for an increased cycling presence – although active travel potential always needs to be viewed in context of the distances involved.
- Public transport use in Liverpool City Centre appears much stronger than across the wider geography, an indication of the importance of connectivity in achieving mode shift.
- Across the whole city region, bus has the largest share of public transport, but less so in the city centre which may owe much to both being the hub of the Merseyrail network and numbers of people travelling from further afield.

A further key mode for travel in the Liverpool City Region is the Mersey Ferries, which perform a dual function. On the one hand they are one of the key visitor attractions for the area, being one of the most recognised brands, with a significant draw; but they are also a key public transport link, providing a commuter link between Liverpool and Wirral. In particular this serves Seacombe, an area which would otherwise have lower connectivity.

Just as we will see with other modes, COVID had a significant disruptive effect on ferry demand although the ability to 'socially distance' on a ferry compared to other modes may have been something of an attraction. The closure of Seacombe for a major rebuild of the terminal from 18th December 2020 to 17th October 2022 will also have impacted on passenger demand. Despite this, numbers suggest a strong and growing recovery in the leisure market – numbers will not yet reflect Seacombe's reopening impact on commuters.

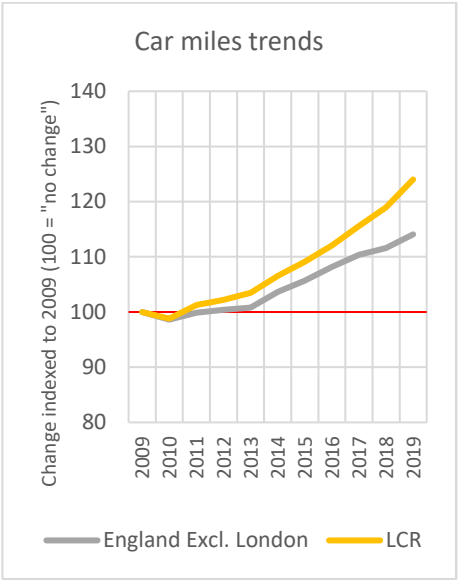
Mersey Ferries

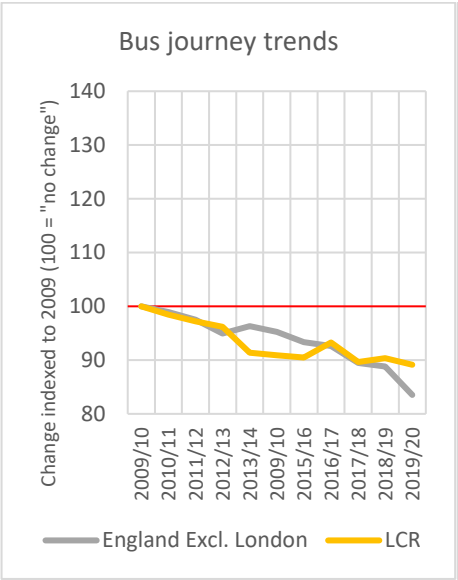


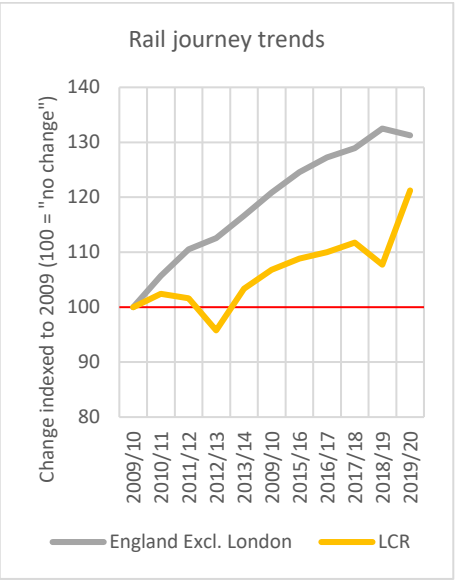
Source: Mersey Ferries Patronage, Liverpool City Region Combined Authority

Mode share is one element of understanding transport issues, but trends are also important; though an important distinction needs to be made between the impact of COVID on travel patterns, preceding trends, and a view on the future, all of which are covered in this document. The focus initially is on the historic trends, which result from both earlier supply and demand factors.

Long-run trends in transport







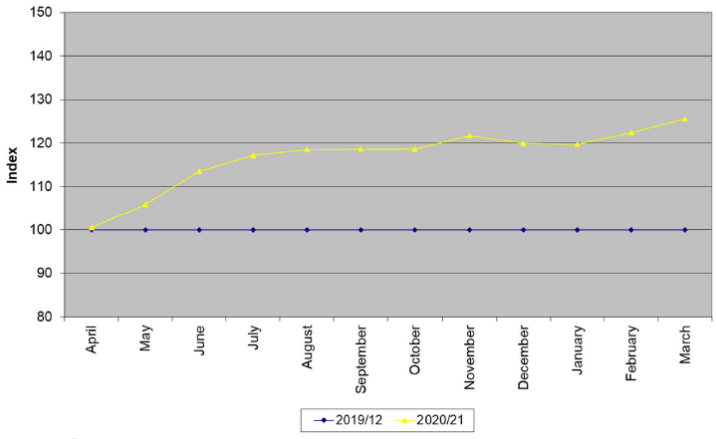
	Car miles per capita	
	2009	2019
England	4,019	4,260
London	1,872	1,949
England exc London	4,404	4,697
LCR	2,946	3,503

	Bus trips per capita	
	2009/10	2019/20
England	88.3	72.4
London	281.8	233.3
England exc London	53.6	41.9
LCR	79.4	67.9

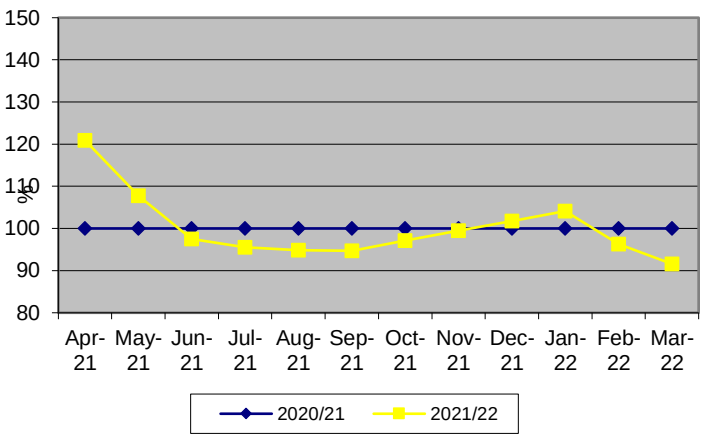
	Rail trips per capita	
	2009/10	2019/20
England	25.5	33.0
London	79.6	104.9
England exc London	15.8	19.3
LCR	61.2	71.1

Source: DfT /ORR Statistics

Figure 3.5: Comparison of Merseyside Cycle Data: 2019/20 (Base Index) vs 2020/21



Comparison of Merseyside Cycle data: 2020/21 (Base index) vs 2021/22



Source: Mott MacDonald

Overall levels of public transport use and active travel (pre-COVID) were lower than that seen in London, but often above that seen for the national average. Again, it needs to be clear that there is often a spatial element to this.

- There tends to be a higher and growing mode share achieved by **rail** in areas that fall within the catchment of Merseyrail Electrics stations, connected to the attraction of a frequent and fast urban offering.
- There is more paucity around **bus** data; Census data showed particular concentrations, which seemed to be connected to areas of lower car ownership and with shorter distances

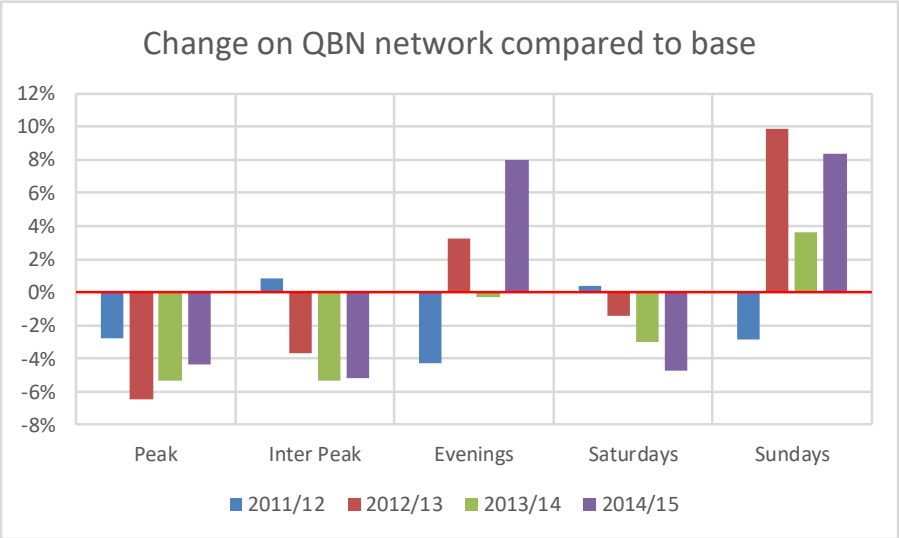
to urban cores. The Quality Bus Network (QBN) aimed to provide an improved offer on selected routes, and data suggests this had some impact on evening and Sundays when services had previously been less frequent.

- **Cycling** data is currently being improved, but the 2011 Census showed some areas with particular concentrations, including where off-road routes exist.
- Data is more available in terms of **road traffic**, through AADF and other sources, and this illustrates some areas where there are specific concentrations – both in terms of movement of people and goods (the latter being primarily discussed in Section 9). Still, trends pointed to ongoing levels of growth in car traffic – and here the LCR was growing above national averages

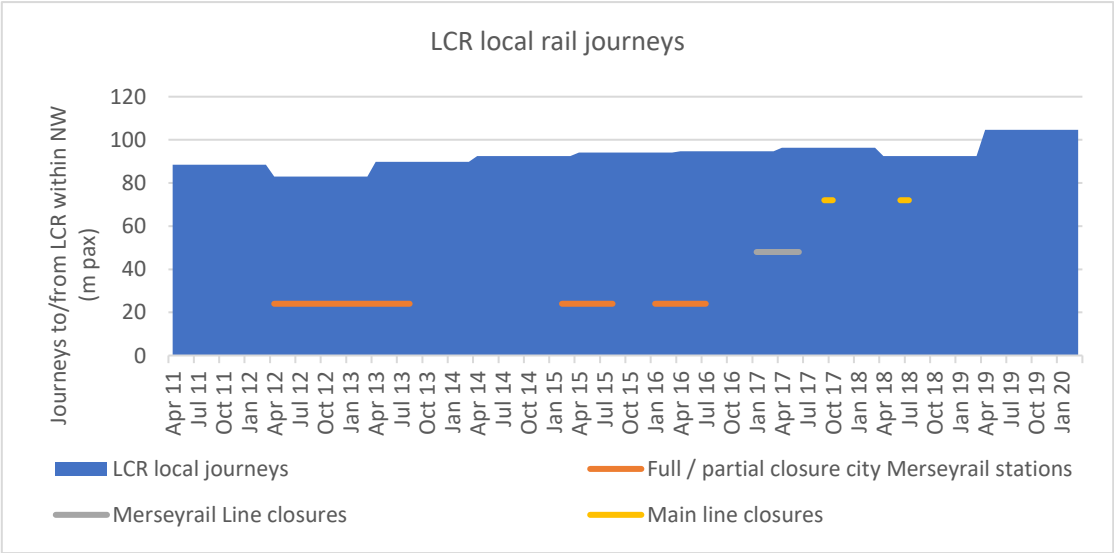
Example factors impacting on public transport demand: introduction of the QBN bus network and engineering work related to rail use.

1. *Growth observed* on the QBN network in the evenings and Sundays, reflecting the improved frequencies.
2. *Growth depressed* on the rail network (lower than expected levels of growth) with constant periods of engineering disruption.

Viewing patronage change: QBN network impacts and rail disruption impacts



Source: Merseytravel analysis, patronage surveys

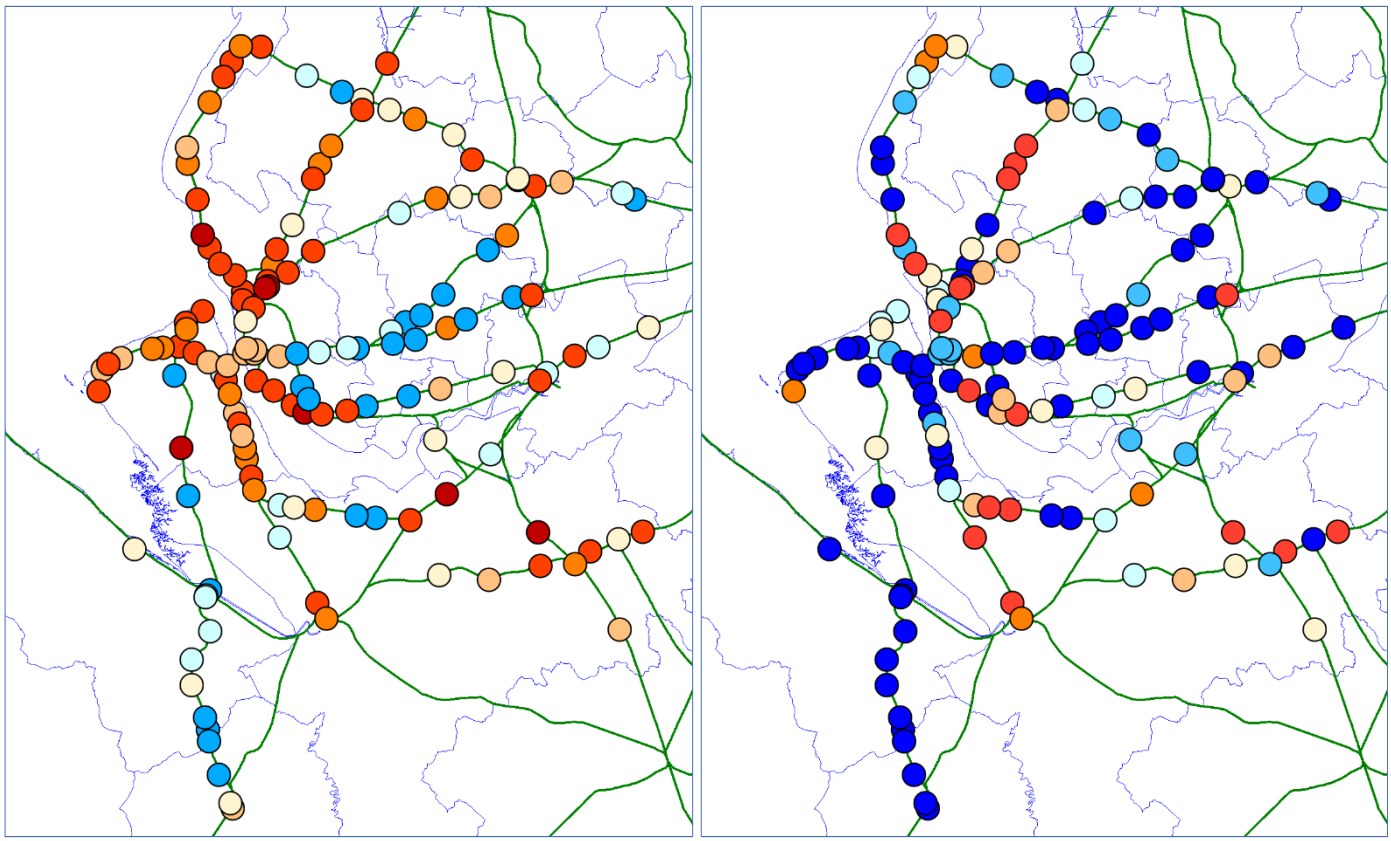


Source: ORR Rail Data

Looking at the five years up to the start of COVID, the pattern of rail demand across the City Region is clear, with most stations on Merseyrail Electrics routes seeing strong growth levels (see below, left). This picture was not matched on the City Line, reflecting – as highlighted elsewhere – the disparity in product between Merseyrail Electrics and other routes. (A notable exception being Newton-le-Willows, reflecting the investment at the station.)

COVID-19 saw a drop in patronage on public transport. However, as the below map on the right shows, this was far from uniform, and by the end of the 2021/22 year, some stations in the city region and its hinterland were recording higher passenger numbers than ten years before. This may be reflect working from home as explored earlier, as well as other factors (such as increased leisure use of transport). Although there is not similarly detailed data showing changes in bus demand, it would not be surprising to see similar variations.

LCR and Hinterland patronage change: pre-COVID and longer term



5 year change pre-COVID (2014/15 to 2019/20)
ORR station entries / exits

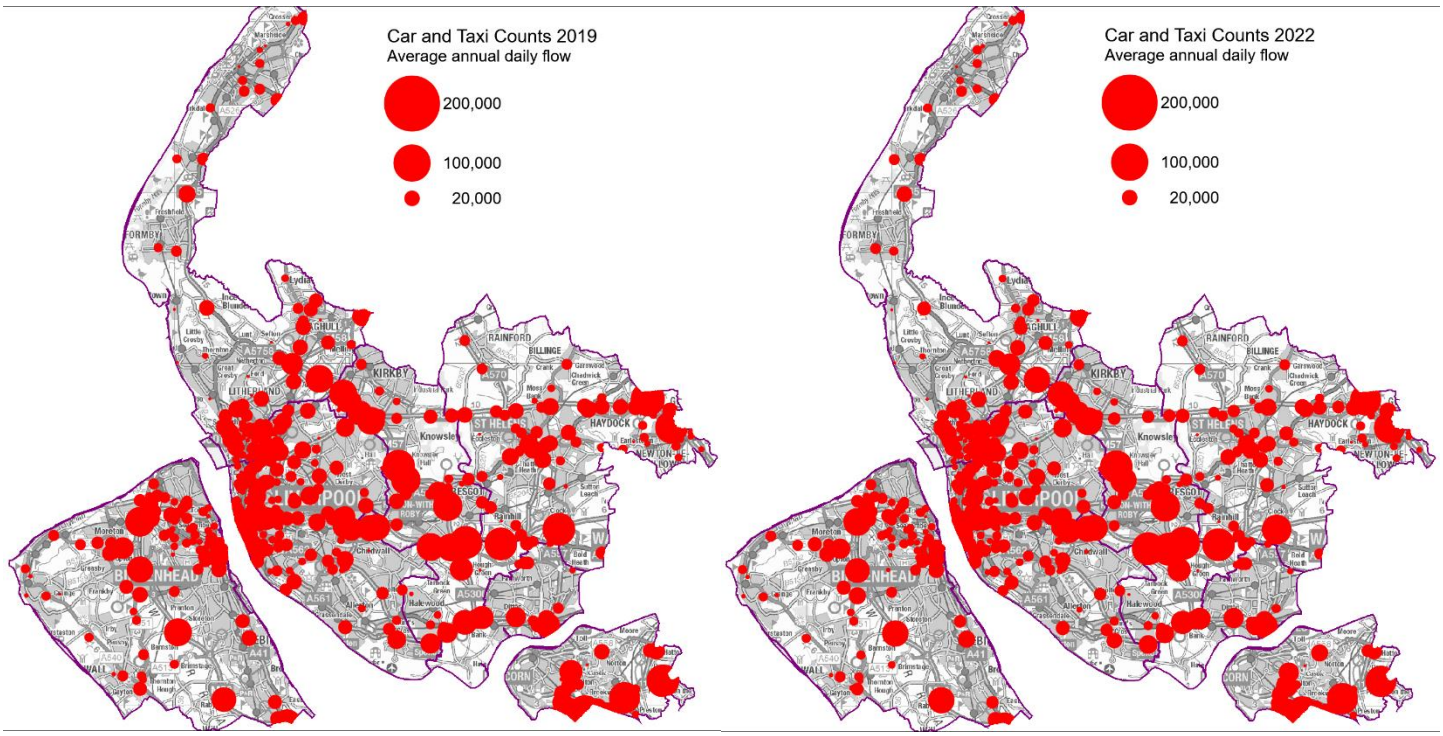
- > +50% increase
- +20% to +50%
- +10% to +20%
- up to +10%
- down to -10%
- -10% to -20%
- More than -20% decrease

10 year change 2011/12 to 2021/22
ORR station entries / exits

- > +20% increase
- +10% to +20%
- up to +10%
- down to -10%
- -10% to -20%
- -20% to -30%
- More than -30% decrease

What happens across all modes matters, given the importance of mode shift to achieve net zero and other issues. The DfT's AADF dataset gives some idea of particular concentrations of vehicle flows in 2019 and 2022, although there are a number of caveats with the information. Obviously much of the higher volumes form along motorways and other core parts of the road network (this partly reflects the counter location). Significant volumes can also be seen elsewhere, giving an awareness of the scale of car use.

Car and Taxi concentrations



Source: DfT AADF

Summary of key points on changes in transport demand

- Up until the start of COVID, there had been strong levels of growth on the rail network; again, this was specifically associated with the Merseyrail electrics network, despite the substantial periods of engineering work referenced above.
- Bus data is again more limited but is suggestive of a stronger performance than national averages; besides the QBNs, the introduction of MyTicket in 2015 may have provided an initial boost in bus patronage. This product aimed at young people also aimed to support 'generational change' in use of bus.
- Car use has increased, after showing a dip during the recession. The growth in car use is perhaps not as substantial as might be expected given the increase in vehicles licensed.

6.2 Census Data 2021 and Transport – key messages

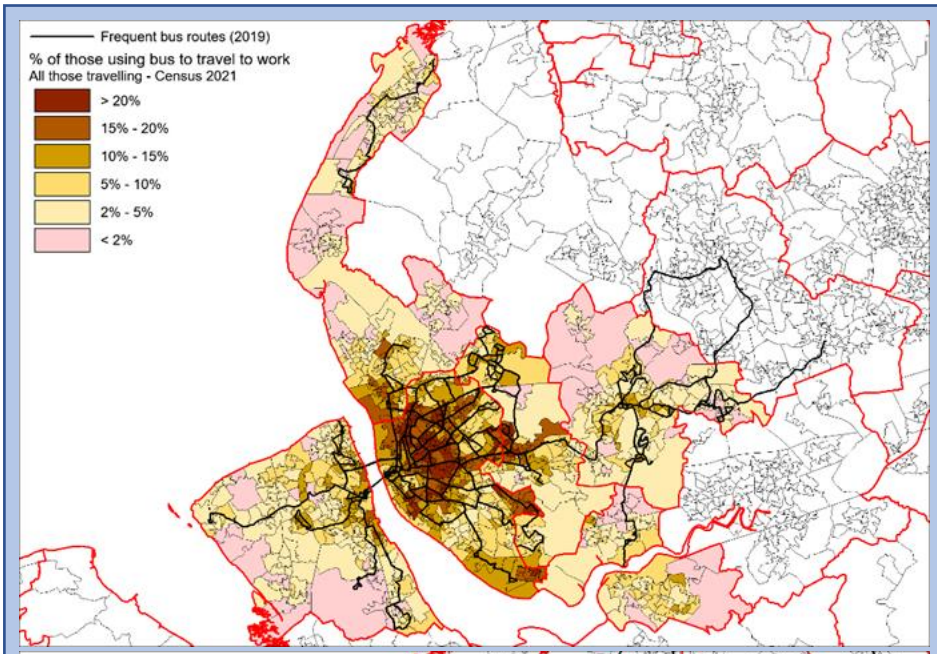
Census data has some flaws if being used for decision making in transport. Firstly (and perhaps most obviously) it only records journeys made travelling to workplaces, which may thus omit many key attractors. Secondly, it only asks for the main mode used on the journey – so on multi modal journeys (such as park & ride or cycle & train) it does not present a complete a picture. Thirdly, the 2021 data is compounded by the fact that it only asks where people travelled to work during the week of the Census, when restrictions remained in place encouraging homeworking. Despite these flaws, which will need solutions in the future, it remains one of the most detailed sets of data.

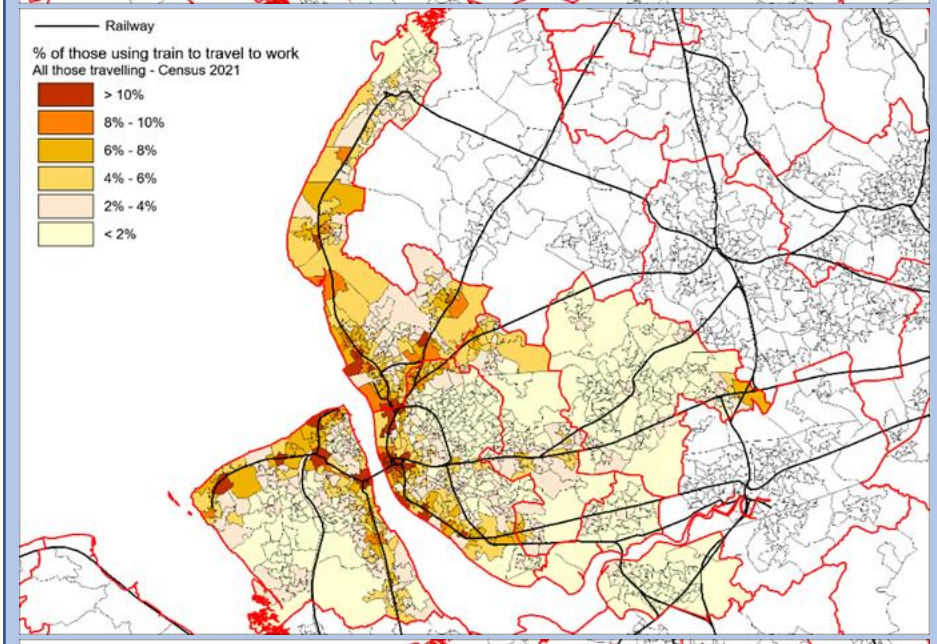
The following maps use *rebased* percentages – the numbers shown are after excluding those who were working from home, thus showing only the proportion of those who were actually travelling for work. Thus, despite the limitations of the Census 2021, they offer a number of key points:

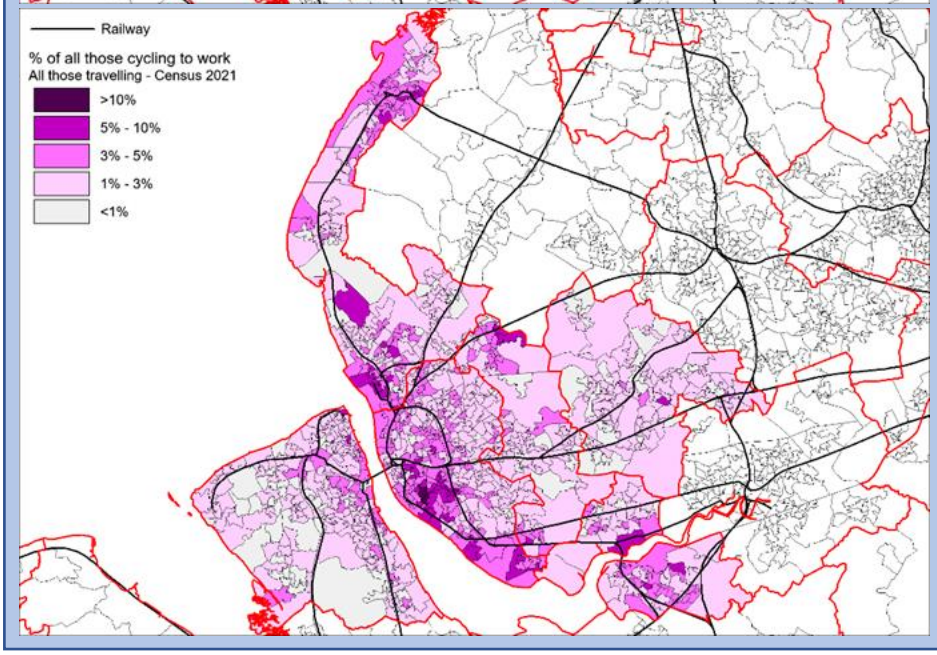
1. Some areas saw over 20% of commutes being made by bus; these often aligned with areas of higher frequency routes – though also needs to be seen against a background of car ownership and deprivation levels.
2. Rail use tended to be higher in those catchments around Merseyrail Electrics stations, often forming over 10% of commutes. Reinforcing the earlier point, the same is not true of City Line stations.
3. Although (as the headline figures show) cycle tends to form a lower mode share, there are a number of locations where its mode share rose above 5%. This is likely influenced by distance to workplaces as well as available infrastructure.

Census Data 2021 –

public transport and cycling

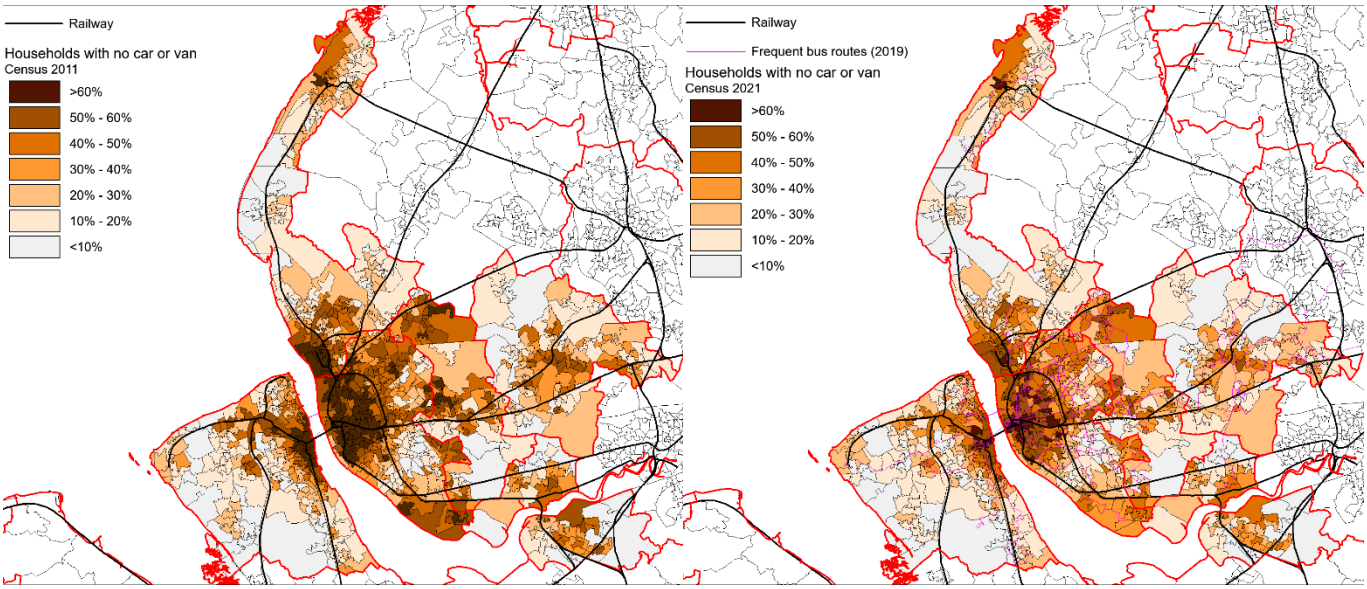






More usefully, the Census data also highlights the levels of car ownership amongst households. It is particularly important to note that there has been a significant decrease in the number of households with no car. (From 34.4% of households with no car to 30.2%; whilst at the opposite end of the scale the proportion of households with 2 or more cars rose from 24.3% to 28.1%.) This pattern is observed across all local authorities in the city region and its hinterland. The spatial patterns of this change are observed in the following maps – and note that this is reinforced by vehicle licensing data presented later in section 6.7.

Changes in households with no car 2011 - 2021



Source: Households with no car available, Census 2011 / 2021, ONS

6.3 Drivers of transport demand

Reflecting on the pattern of transport use, both now and in the future, the spatial element becomes even more important, especially in terms of those attractors which generate demand. Although COVID has increased working from home in some sectors (Section 5), this is not universal, and employment locations are likely to continue to be an important factor in travel demand. It also remains the case that even for office-based work, face to face interactions matter, and form a key part of growth in productivity[14]. Increasingly, leisure (as opposed to just retail) is also emerging as a key factor in transport demand. Non-town centre leisure destinations are not always be served optimally (for example with reduced frequencies at weekends, when leisure demand is highest). Examining the wider picture of connectivity (Section 8) is important in all this.

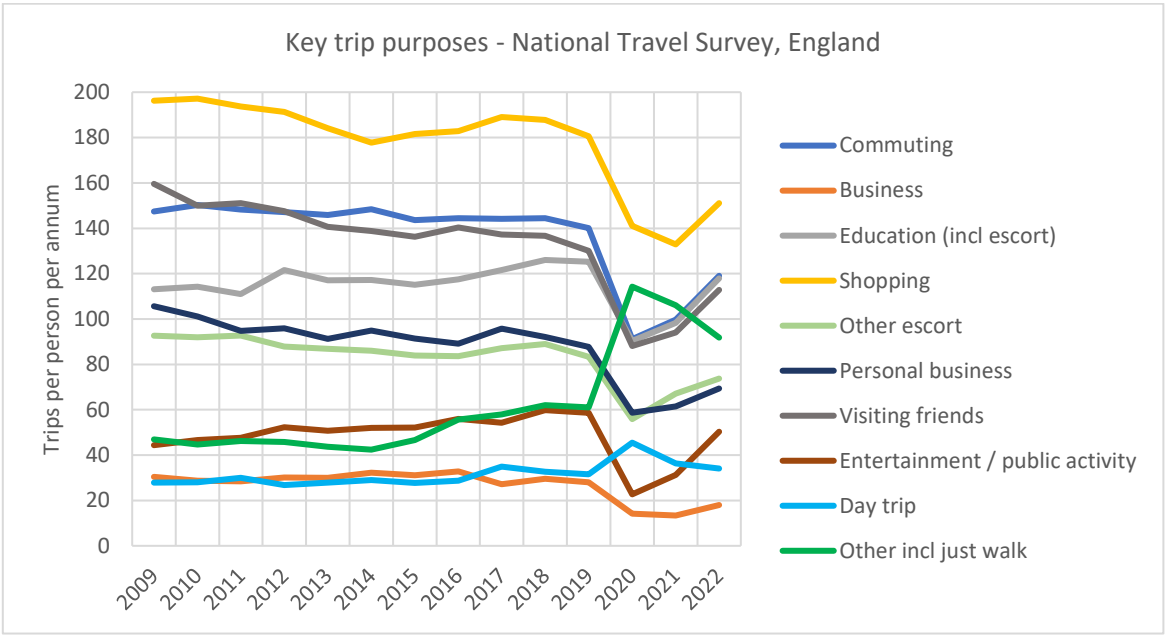
A part of demand in transport is also related to digital infrastructure. This can facilitate working from home and other services, but both poor digital connectivity, skills, and affordability can act as barriers. Although we do not explicitly present data on digital connectivity here, the scenarios later in this report assume varying levels of infrastructure and use.

In terms of drivers of demand, COVID has impacted on much of this (as will be examined in Section 7), but patterns were already changing. Data from the National Travel Survey presents (at least at a national level) the key drivers of demand in terms of the numbers of trips being made. Note that to some extent this shows the range of volumes of trips that arise from non-commuting trips – but also

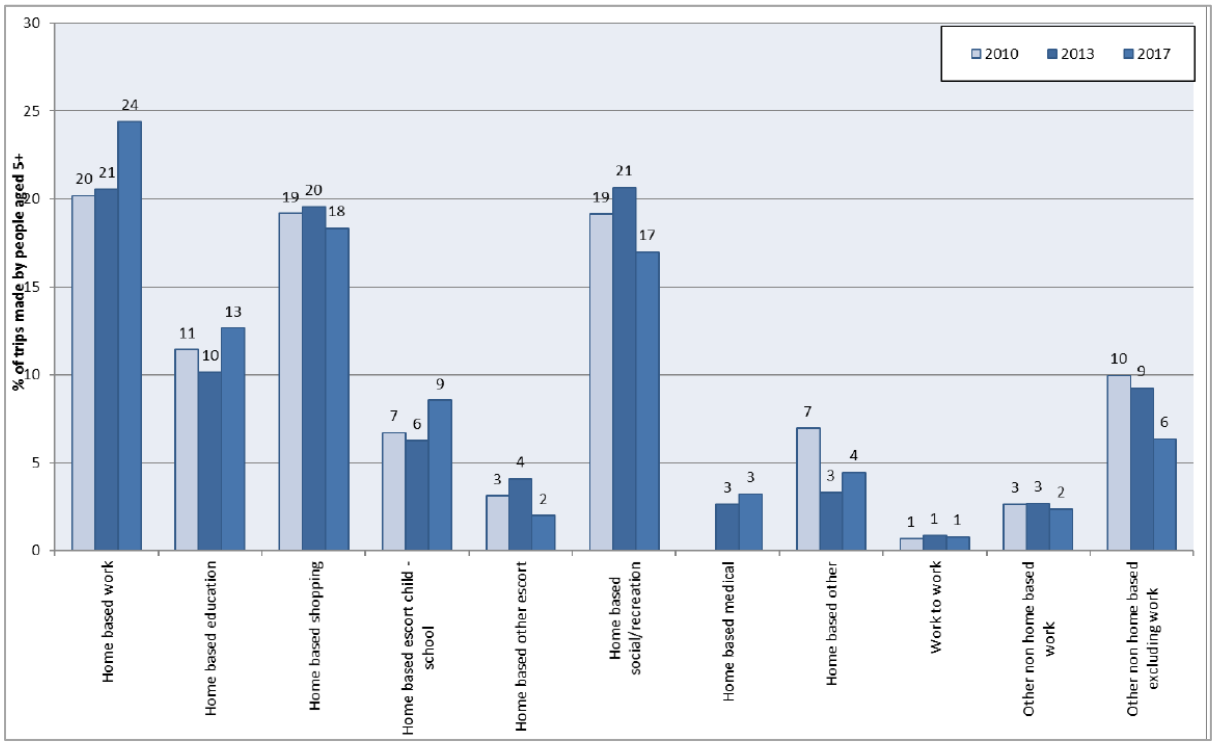
14 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1079102/agglomeration-under-covid.pdf

that overall, there has been something of a decline in trip rates overall. Shopping was the biggest driver of demand though had already been showing something of a decline as had trips for personal business, both possibly connected to greater use of online options. Day trips had been showing an increase as had 'just walk trips' – and this latter exploded during 2020 (perhaps driven by restrictions limiting other possible activities. Although this is national data, many of the messages appear to be reinforced by the LCR Countywide survey – although the most recent version of this is 2017, and there is a need to understand what patterns of demand may now be emerging.

Trips and journey purpose



Source: National Travel Survey, DfT, 2022



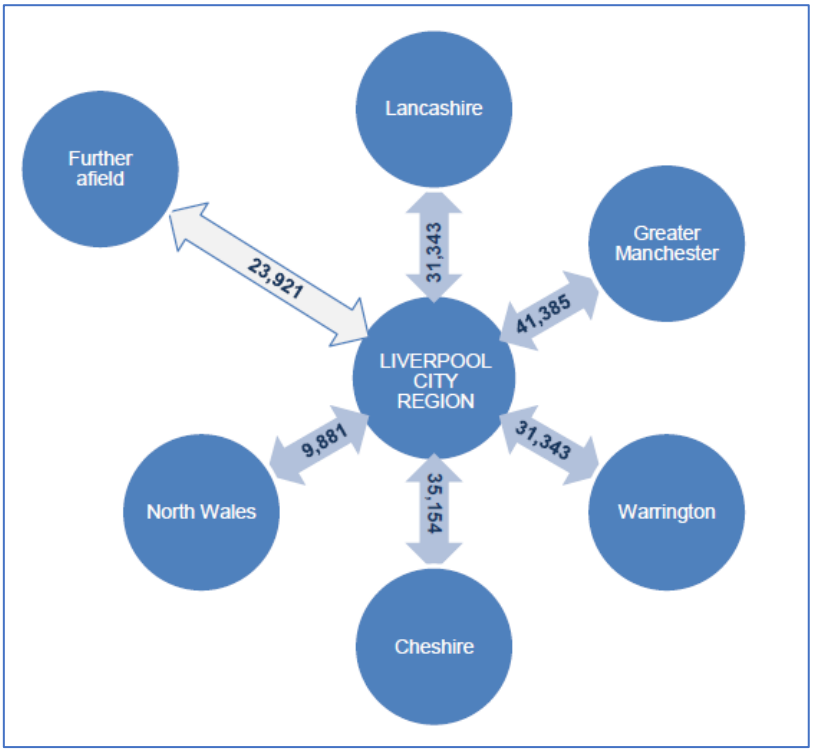
Source: LCR Countywide Survey, 2017

6.4 Liverpool City Region and its hinterland

Finally, when we consider transport issues, again we return to the element that 'no area is an island'. With significant levels of trips in and out of the city region for commuting alone (37% off all commuting trips) addressing transport in LCR means considering 'cross-boundary' journeys. Note, the issue of journeys beyond the city region is also relevant for other trip purpose – and a key consideration for sectors such as the visitor economy.

Given that the diagram below is only for commuting, whilst representing some of the volumes, these will be a significant under-representation of all cross-border trips. (See also later in this document for an analysis of the visitor economy.)

No area is an island – Commuting trips to/from the Liverpool City Region (2011)



Source: Census 2011, ONS

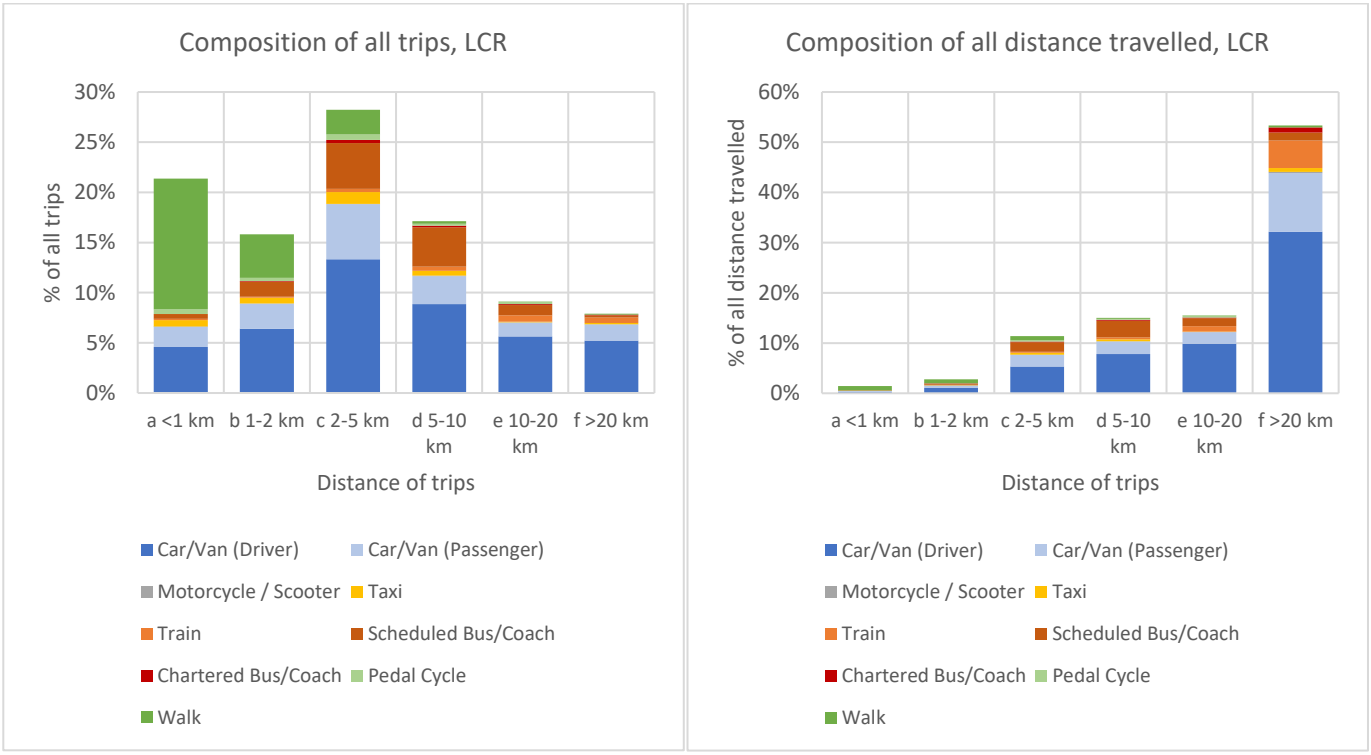
6.5 Travel patterns and mode choice

Understanding travel behaviour is a key aspect of understanding the issues involved. The spatial element we have already looked at, and this is reinforced when we consider the behaviour in the actual trips being made.

Conventional analysis has focussed on the trips being made (chart on the left below). This tends to indicate the high number of trips being made at short distance, which could be converted to active travel. Data on this for the Liverpool City Region tends to reflect findings in the National Travel Survey, with 11% of all trips being both under 2km and made by people driving a car. The potential existing thus for more active travel, with attendant health benefits.

However, when we consider issues such as carbon, it is more instructive to focus on distance travelled. So, 13% of all distance travelled came from car driver trips of between 2km and 10km in length, and 42% of all distance travelled came from car driver trips of over 10km. This pattern may have changed during COVID, with uncertainty still in terms of longer-term demand, but nevertheless there are strong implications in this evidence for where LCR wants to get to with its transport modal share.

Journey purpose: both for numbers of trips and distance covered



Source: Countywide Travel Survey, Merseytravel, 2017

	LCR 2017		England 2019		England 2022	
	% of all trips	% of distance travelled	% of all trips	% of distance travelled	% of all trips *(% of 2019 total trip volume)*	% of distance travelled *(% of 2019 total distance volume)*
Car (driver)	44%	57%	40%	49%	*35%*	*42%*
Car (passenger)	16%	19%	21%	28%	*17%*	*23%*
Train	2%	7%	3%	11%	*2%*	*8%*
Bus	12%	10%	5%	4%	*4%*	*3%*
Cycle	2%	1%	2%	1%	*2%*	*1%*
Walk	20%	3%	26%	3%	*28%*	*3%*

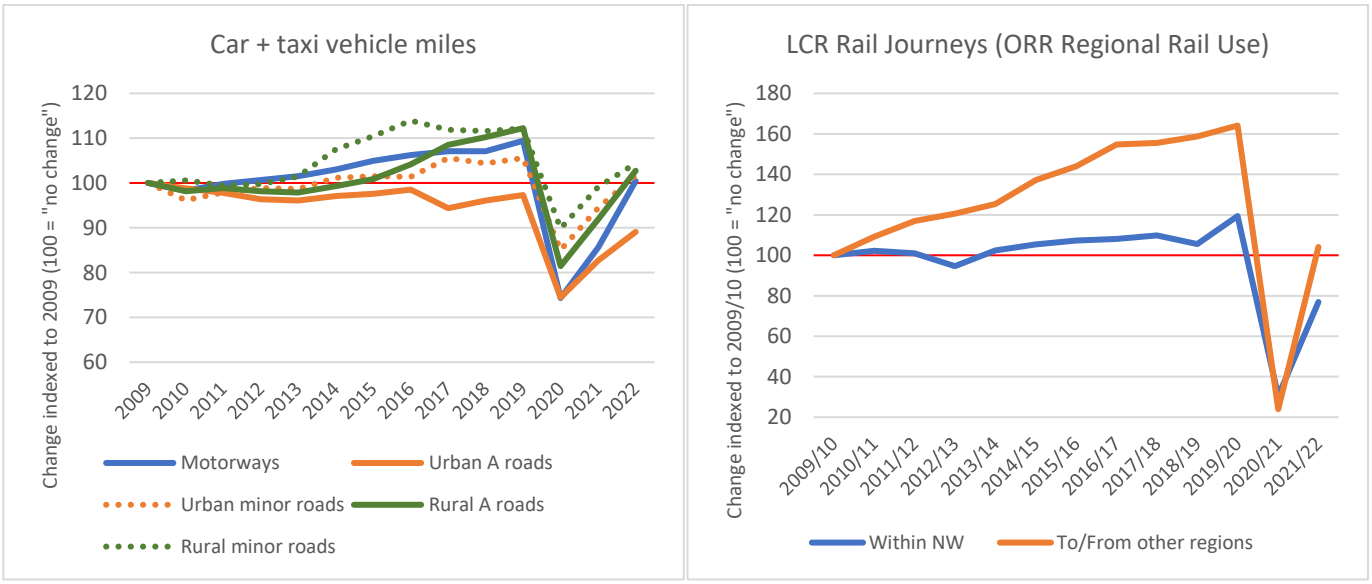
Source: Countywide Travel Survey, Merseytravel, 2017 / National Travel Survey / DfT

Clearly COVID has been a disruptor on the observed trends of transport use that resulted in the above patterns; hence why the evidence includes a focus not just on the impacts of COVID both in transport use and the drivers of demand, but also on a range of possible futures (Section 7). That does not mean the data showing recent trends should be ignored, as there is much there which can help to point towards potential solutions.

The diagrams (below) help to illustrate some of the key elements, but there is more detail than first suggested. In general, the overall pattern in LCR follows the national trends:

- There is a pattern of increasing car use, with miles travelled have grown 24.0% from 2009 to 2019, whereas across England it grew by 14.1%. To some extent this may be connected to the fact that LCR has traditionally low levels of car ownership, so is starting from a lower base; and this may also be a reflection of the increased employment (as in Section 4). More details of car ownership and the role of ZEVs in addressing the issue are in Section 3.
- Just as with England as a whole bus use declined over the ten years up to the start of COVID (and note that the last few weeks of the 2019/20 period will have been affected by COVID restrictions, unlike the calendar year road data). Bus use in Liverpool City Region dropped by 10.9% compared to 16.5% across England as a whole, excluding London. This lower level of patronage loss may be down to a number of city region interventions which provided some patronage growth and limited decline, including the impact of QBNs and MyTicket as previously mentioned.
- Compared to bus, there was ongoing growth in rail patronage; albeit noting that in the city region this growth was lower than national levels: 21.2% compared to 26.3%. Still, this is not the full story, as whilst growth on journeys more locally (within the Northwest) were at 19.4%, journeys to/from the Liverpool City Region were higher, at 64.1%. This latter is a reasonable reflection of both the continued growth in LCR's visitor economy and also the improved links for city region residents. However, the former is also a reasonable reflection, given the sustained periods of engineering works already mentioned, including periods where whole lines and key city centre stations were shut. The upturn in journeys in 2019/20 reflected the first long period without significant disruption.

Long-run and COVID impacts on car / rail journeys, LCR



Source: Road traffic, DfT; Regional rail use, ORR

6.6 COVID impacts on travel demand and the future

Much data is now available so we can understand the impact that COVID restrictions had on most transport travel patterns, even if the longer-term trends post-COVID is something that will not become clear for some time. It should be noted that as well as the impacts on transport in many cases COVID has also impacted on methods of data collection, with some evidence (such as face-to-face surveys) only recently recommencing. Accordingly, much of the commentary revolves around national-level data and there needs to be an awareness of where Liverpool City Region may differ from this, even though certain commonalities would be expected: here it is especially important to be aware of the differences in levels of working from home that occurred, as presented in Section 5; and noting the splits in the Census data showing that overall in the North of England levels of homeworking on Census day tended to be much lower than in London and the Southeast.

Figure 6.5: Proportional change in highway flows in AM peak – Scenario 2 vs Base

Source: COVID impacts modelling study for LCR CA, Mott MacDonald, October 2020

At a more local level, it is important to note that during the pandemic, a combination of mobile phone data and the Liverpool City Region Transport Model were used to look at changes in transport demand and use; two scenarios were investigated, one with a long-lasting epidemic, one where the impact was shorter with faster demand recovery. Note that this latter scenario ("Scenario 2) suggested a longer-term switch away from public transport with resultant increases in road use.

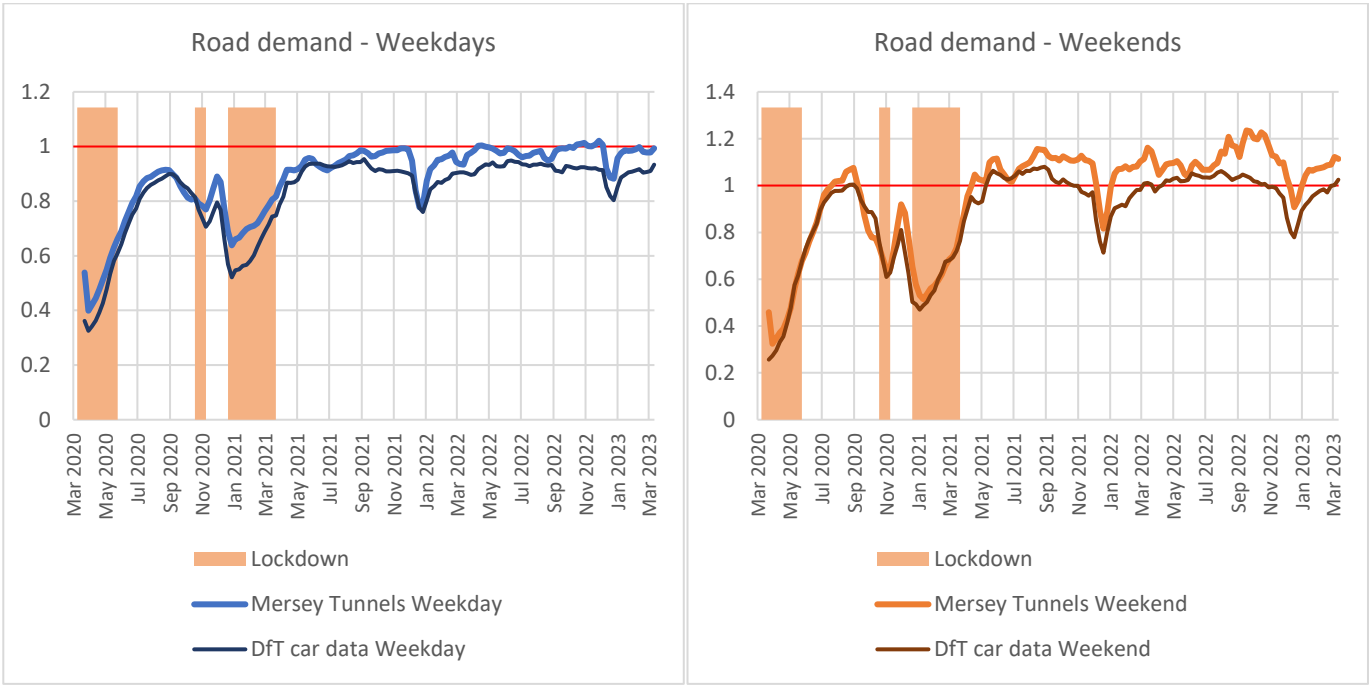
Certainly, in terms of road traffic, there are a lot of similarities between national patterns and the observed flow through the Mersey Tunnels. What is noticeable also is a common message in that whilst demand for travel on weekdays in general has mostly been below pre-COVID levels, demand on weekends frequently exceeds it. Note that recent rises in fuel costs have occurred (Section 8) but whilst this may have dampened demand, it has not suppressed it.

In public transport there have been significant reductions in patronage during 2020/21. In general, this drop in demand was less in the Liverpool City Region than nationally: rail demand being 25% of 2019/20 levels, compared to 23% across Britain; and bus demand being 43% of 2019/20 levels,

compared to 36% across England. These relatively higher levels of public transport use may be related to the lower levels of car ownership (see Section 6), but also the lower levels of jobs that could be done on a work from home basis. There may well also be something in terms of the high level of local leisure opportunities available in the city region, during those periods where restrictions were eased.

Active travel is one element which showed some significant increases during the pandemic. Analysis suggests this is more connected with leisure demand rather than cycling/walking replacing car for more utilitarian trips such as shopping or work, but nevertheless still provides for health benefits. Nationally, after reducing during 2021, cycling again appears to have increased in 2022.

Impacts of COVID: Road, Rail and Bus demand, nationally and locally



Source: Merseytravel data / DfT Data

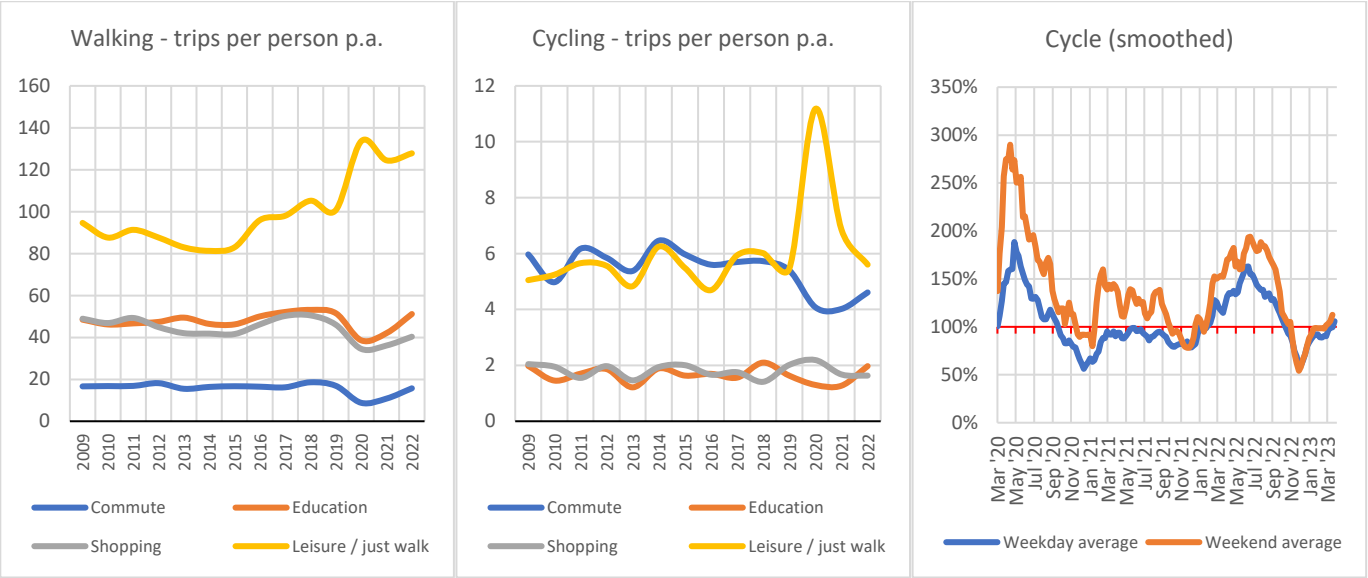
000s rail trips	Liverpool City Region: Merseyrail station[15] entries / exits	Liverpool City Region: To / from other regions	Liverpool City Region: Within region	Liverpool City Region: Total trips	GB: To / from other regions	GB: Within region	GB: Total trips
Apr 2009 - Mar 2010	46,191	3,794	87,654	91,448	370,030	695,360	1,065,390
Apr 2019 - Mar 2020	59,719	6,226	104,646	110,872	481,726	1,021,847	1,503,573
Apr 2020 - Mar 2021	16,211	910	26,670	27,580	79,557	264,310	343,867
Apr 2021 - Mar 2022	37,434	3,952	67,614	71,366	261,962	632,277	894,239
Change 2021/22 from 2019/20	*62.7%*	*63.4%*	*64.4%*	*64.4%*	*54.4%*	*61.9%*	*`59.5%*

Source: ORR data

000s bus trips	Liverpool City Region	England	(excl London)
Apr 2009 - Mar 2010	149,119	4,613,385	2,375,164
Apr 2019 - Mar 2020	124,813	4,071,169	1,980,614
Apr 2020 - Mar 2021	53,028	1,580,575	724,403
Apr 2021 - Mar 2022	91,603	2,839,207	1,363,099
Change 2021/22 from 2019/20	*73.4%*	*69.7%*	*68.8%*

Source: Merseytravel / DfT Bus Data

[15] Excluding City Centre stations



Source: National Travel Survey and Covid Transport Use data, DfT

One of the best datasets available for public transport is that of the DfT daily transport use data. This shows that compared to road demand public transport has been slower in recovery, regardless of weekday weekend demand. During the height of the pandemic, prominent Government messaging specifically encouraged people to avoid public transport, which had a lengthy impact beyond the period or restrictions (and may still be impacting on some groups' appetite for using train and bus). A further factor may lie in continued levels of working from home. Having noted that, up until the period when the rail strikes began, during 2022 rail demand had been on a strong recovery trajectory. Regardless, of all these factors, the fact that car demand has remained at a fairly consistent level despite high fuel prices highlights the risk of a more car-based future than previously envisaged, and the implications for how mode shift can be encouraged becomes even more important.

The use of scenarios to project future uncertainty in conjunction with other evidence becomes a useful tool in ensuring policies emerging from the LTP provide solutions in a range of plausible futures. For example, helping to answer questions such as "what might an x% reduction in car use look like?" This is an element explored in the next Section.

6.7 Car ownership and zero emission vehicles

Levels of car ownership

	England	LCR	Halton	Knowsley	Liverpool	Sefton	St.Helens	Wirral
% households with no car								
Census 2011:	25.8%	34.4%	27.0%	37.1%	46.1%	28.5%	26.7%	28.0%
Census 2021:	23.5%	30.2%	23.8%	31.2%	40.1%	26.4%	23.2%	25.1%
% households with 2+ cars								
Census 2011:	32.0%	24.3%	30.0%	22.1%	15.7%	28.3%	30.7%	28.8%
Census 2021:	35.2%	28.1%	33.9%	27.6%	19.5%	31.0%	34.5%	32.5%
2011-2022: Change in total cars (private keepership)	*+12.5%*	*+13.9%*	*+14.6%*	*+22.0%*	*+19.8%*	*+8.2%*	*+13.3%*	*+10.2%*

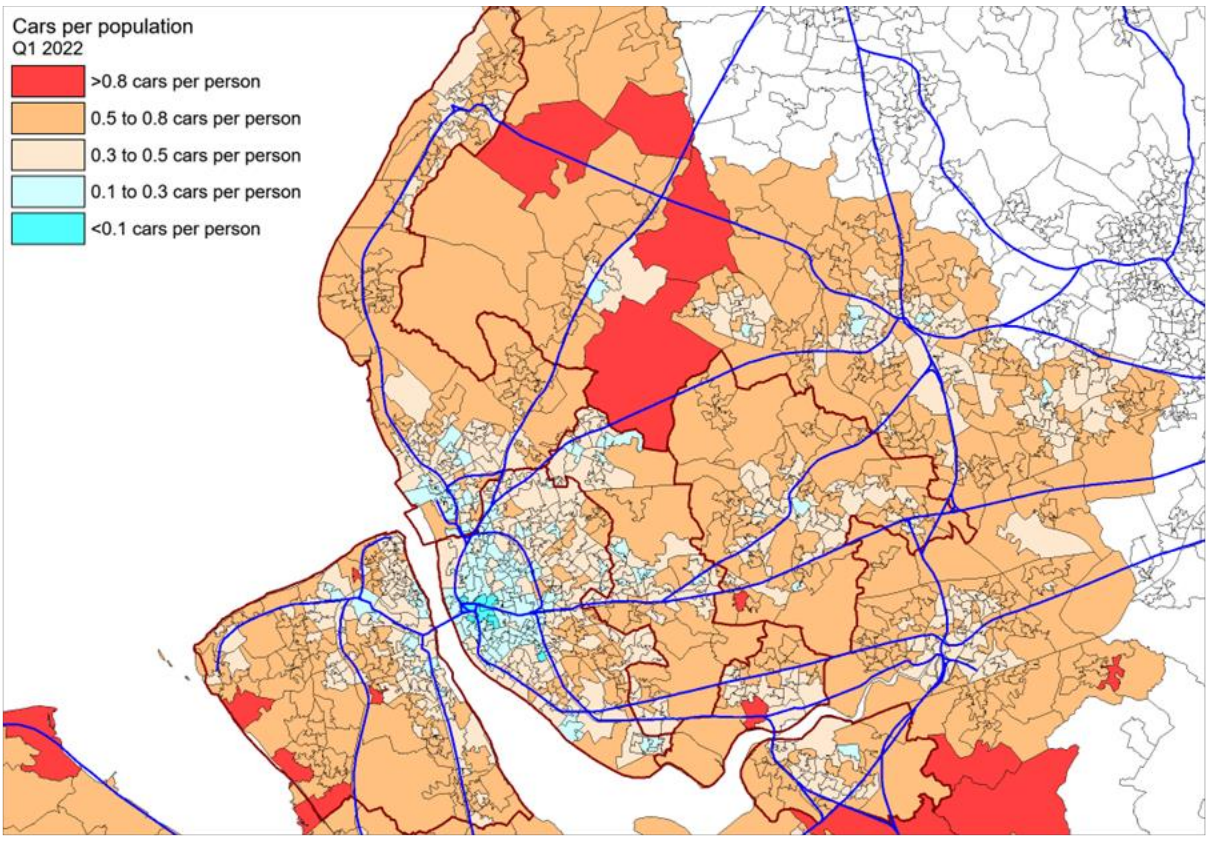
Source: Census 2011/2021, ONS / DfT Vehicle Licensing statistics

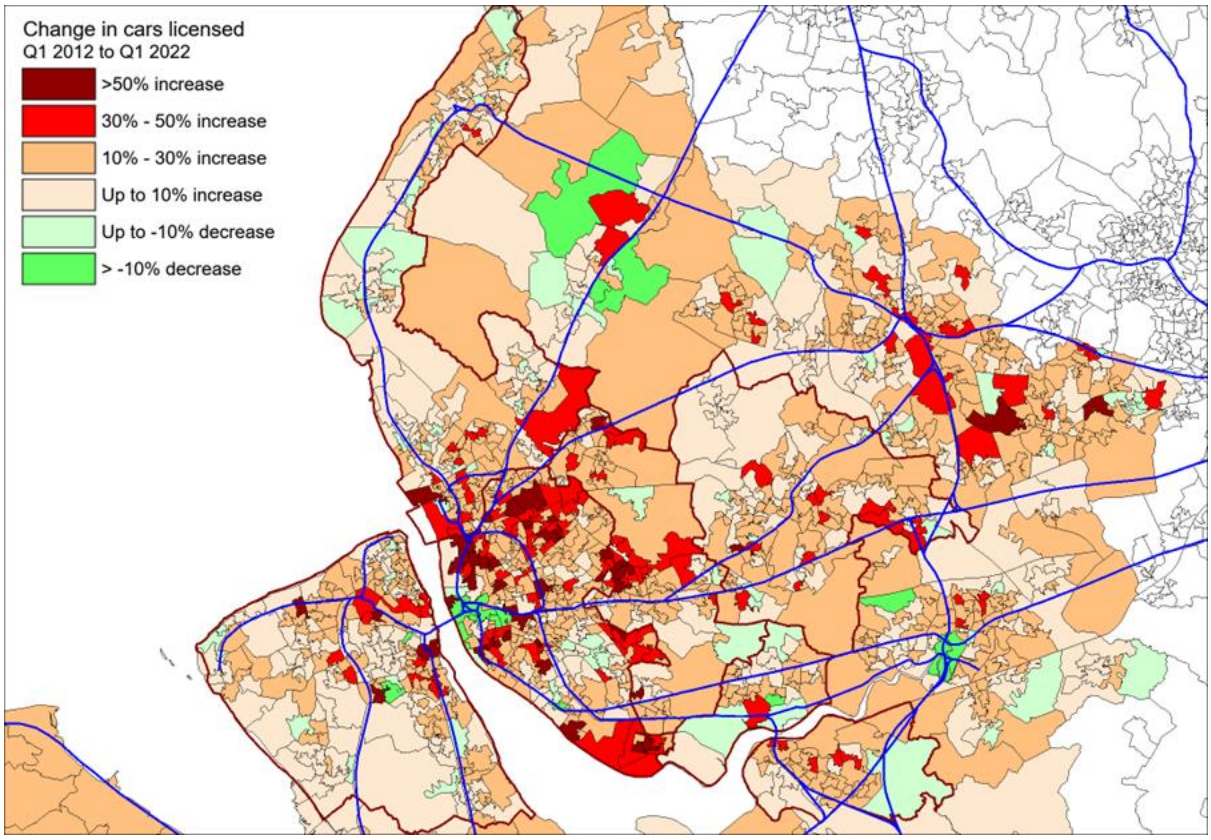
In terms of public transport use and active travel, the Liverpool City Region has always had something of a 'strength', which is in part due to car ownership being at lower levels than is true nationally. Thus, in the 2011 Census over a third of households in the Liverpool City Region had no access to a car, compared to 26% nationally, though by the 2021 Census this had changed to 30% with no car compared to 24% nationally. Note that this factor may partly reflect the economy of the Liverpool City Region and income levels, although factors such as the presence of the Merseyrail Electrics network and more dense bus connectivity in parts of Liverpool itself may support this.

Growth in car ownership in the Liverpool City Region has been at a slightly higher level that seen nationally (+13.9% 2011 to 2022, compared to +12.5%). This has been particularly high in Knowsley, possibly connected to increased housing growth. Car ownership has increased across the Liverpool City Region – of concern given the need to reach net zero – although with a relatively lower growth in Sefton itself. Key will be understanding how economic growth in the city region, addressing many of the long-standing socio-economic issues, can be decoupled from car growth.

The spatial element of car ownership is important when it comes to considering what solutions may exist to support mode shift. Particularly high concentrations of car ownership are observed in West Wirral and parts of Halton and St.Helens, although in truth the further away from the Merseyrail Electrics network the more noticeable it is. That being said, although those areas with high levels of car ownership are of concern, many of those areas seeing higher levels of growth lie elsewhere – South Sefton, North Liverpool, Speke and North Birkenhead of note amongst other areas. Again, this may parallel with housing development. It should be noted that many of these areas are also those where the connectivity analysis suggests the public transport offer is weaker (Section 8), but it should be remembered that car *ownership* does not always indicate levels of car *use*.

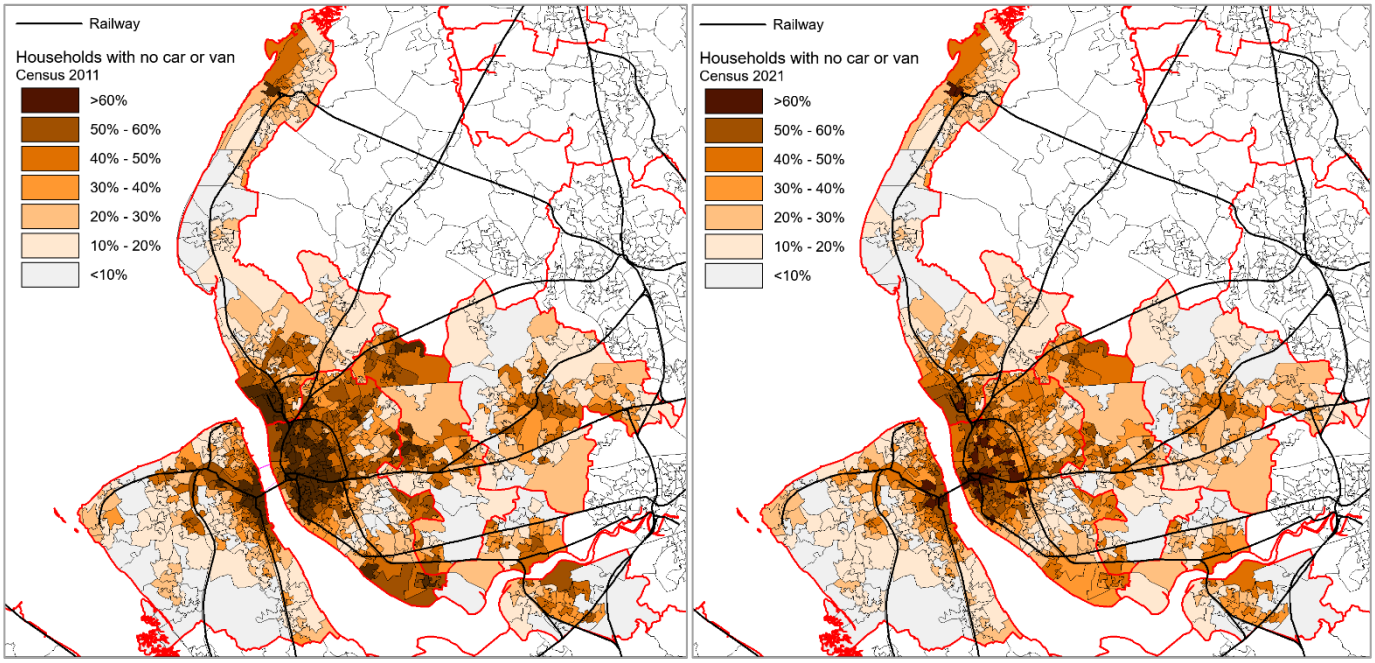
Car ownership and changes over 10 years: LSOA-level data



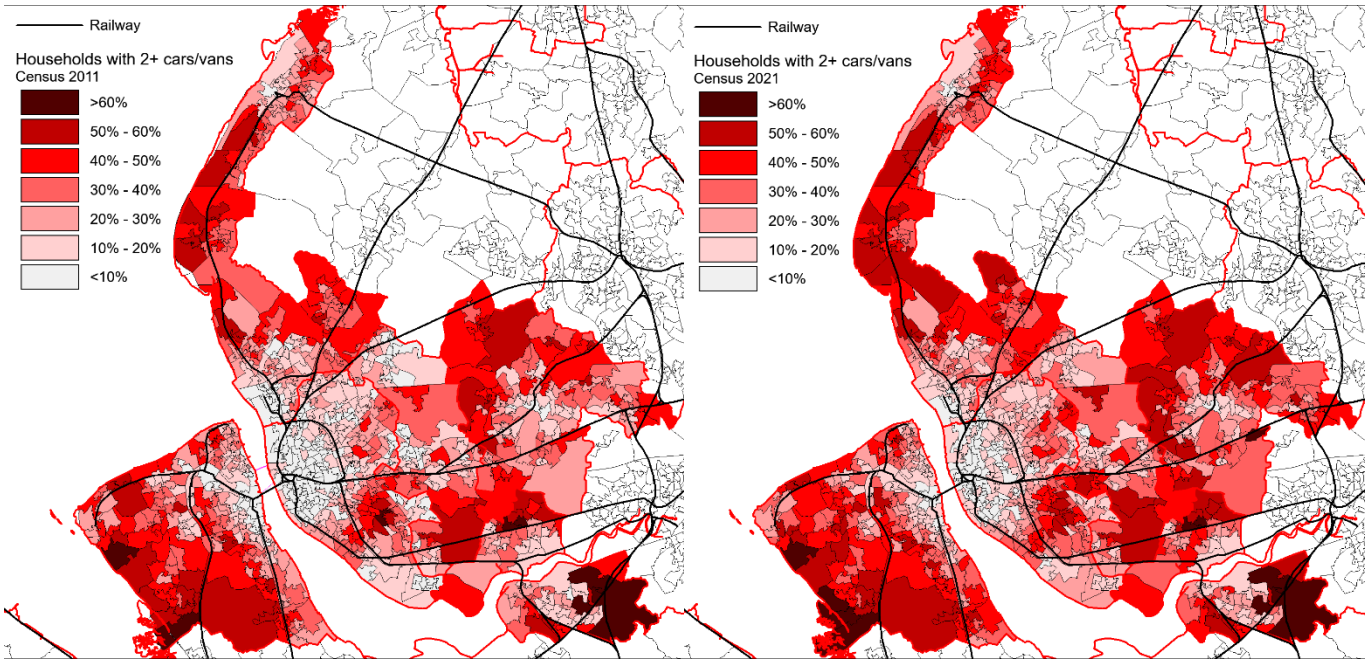


Source: Vehicle Licensing data, DfT

Areas with no cars or vans per household



Areas with 2 or more cars or vans per household



Given the importance of achieving net zero, it is important to consider all aspects of transport. Even allowing for increased active travel, increased public transport, and reducing the need to travel (such as working from home), given both current mode share and the need to grow the economy identified in Section 5, use of the car is still likely to be a significant component of travel.

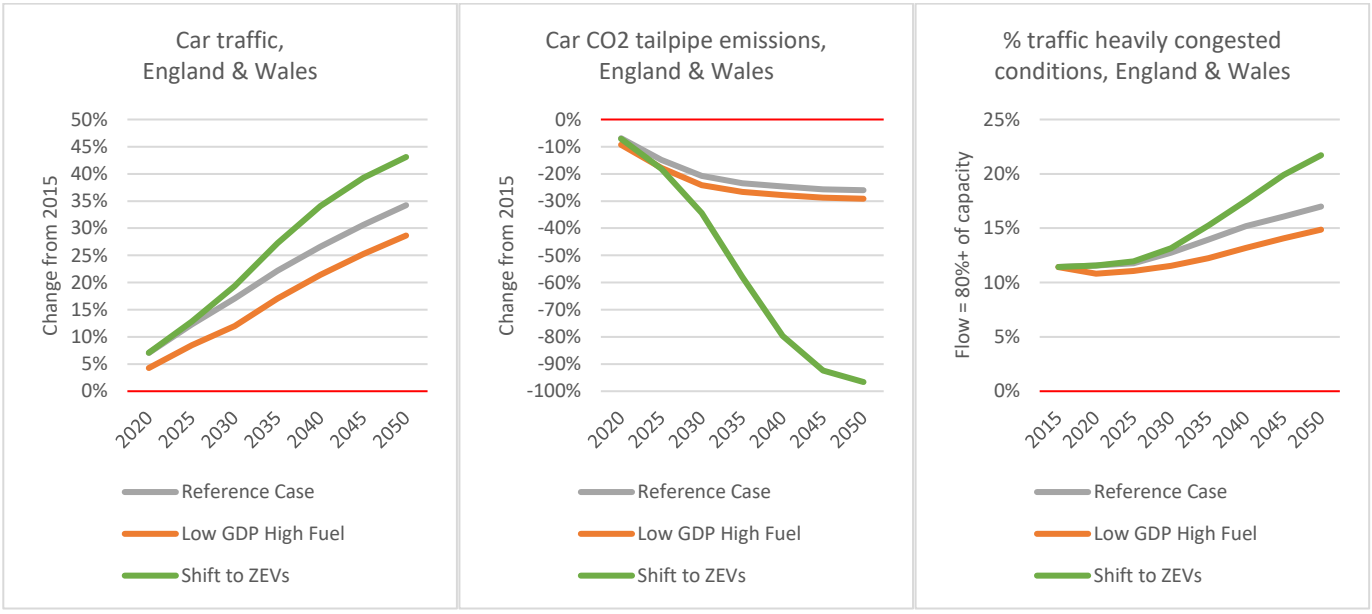
Current data suggests relatively low levels of uptake of zero emission vehicles or hybrid vehicles within the Liverpool City Region, compared to national patterns. Given the lower levels of disposable income in the Liverpool City Region and the higher typical cost of a zero-emission vehicle this should perhaps not be a surprise. Equally the rapid increase – both nationally and locally – is a factor, although affordability may well emerge as an element at some point, impacting on this uptake.

The scenarios work LCR CA is developing shows a range of futures when it comes to road transport. It is worth noting here the latest DfT traffic forecasts – these are from 2018, so may not necessarily

reflect many recent changes on travel demand, including Brexit impacts, COVID impacts (such as working from home), increased fuel costs, etc. In total there were seven scenarios, including a Reference Case (i.e., the current core assumption used by DfT). The accompanying diagrams focus on just three of the scenarios: the reference case, "Low GDP High Fuel" (a poorer performing economy, which may be closer to the current situation), and "Shift to ZEVs" (which assumes by 2040 all sales of new vehicles are zero emission, which is less optimistic than the Government's decarbonisation plan).

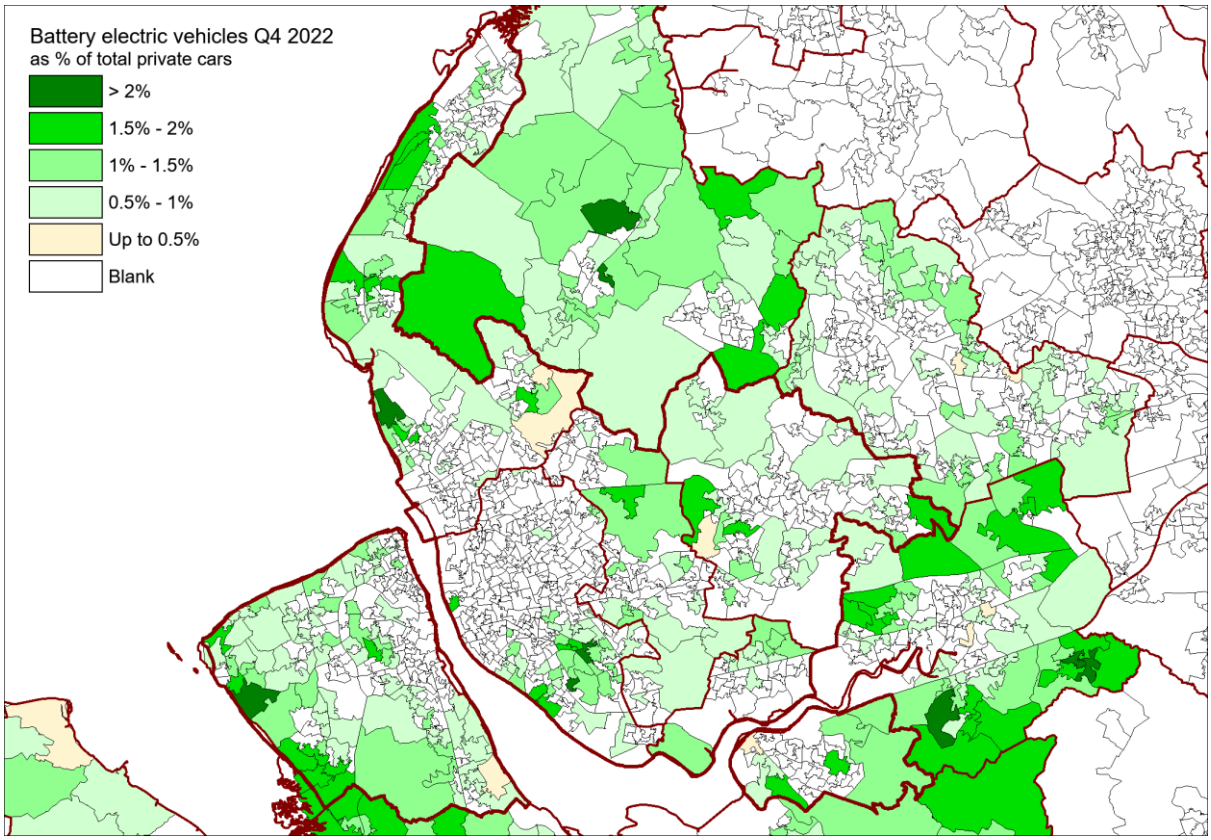
This suggests that although the ZEV scenario helps get near to the goal of zero emissions by 2050, by itself this is not a solution, as cheaper relative running costs compared to ICE vehicles means a significant growth in traffic volume and even larger increase in congestion. It has been recognised that fiscal measures may be needed, given the loss of treasury income from carbon fuels, but this is not assumed within these scenarios. Still, even in a poor performing economy with high costs, significant growth in traffic is expected. Active travel and public transport attractiveness will be key going forward.

National forecasts for car traffic, emissions and congestion



Source: DfT 2018 forecasts (be aware of the 2022 Common Analytical Scenarios)

Levels of private ZEVs, Liverpool City Region



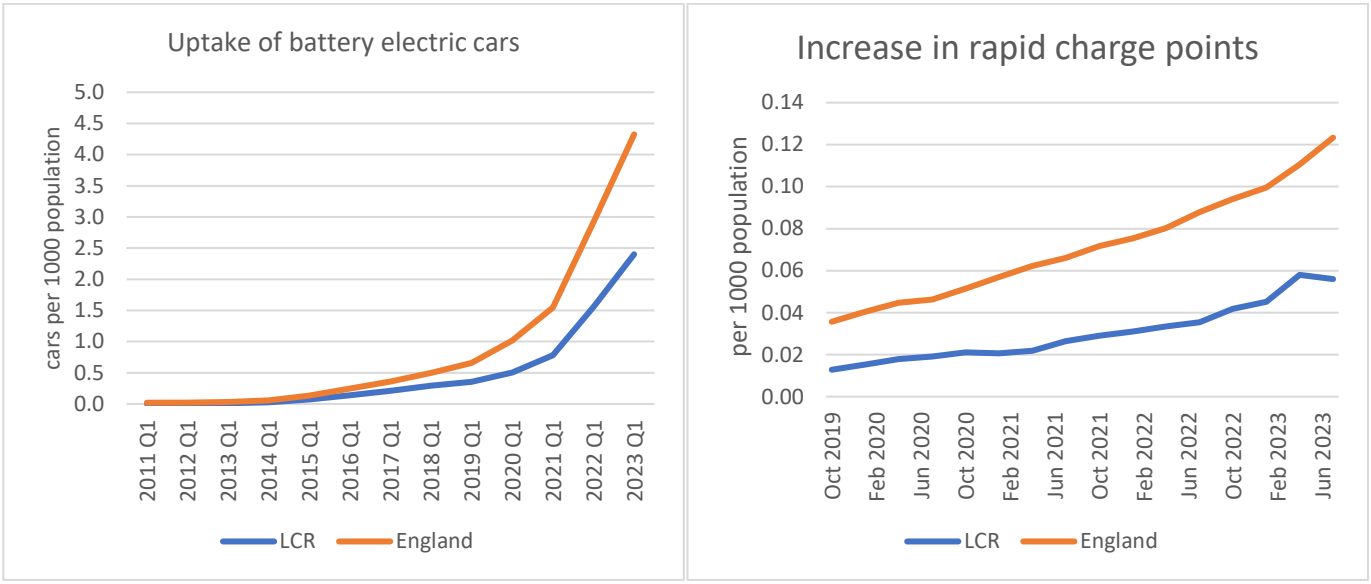
Source: DfT Vehicle Licensing statistics, Q4 2022

Note that 'Blank' can include areas where fleets exist but where confidentiality would be broken

There are two key points to be aware of regarding zero emission vehicle uptake; firstly, though starting from a low base there has been an accelerating rate in recent years; and secondly, the uptake is on a lower level in Liverpool City Region than nationally.

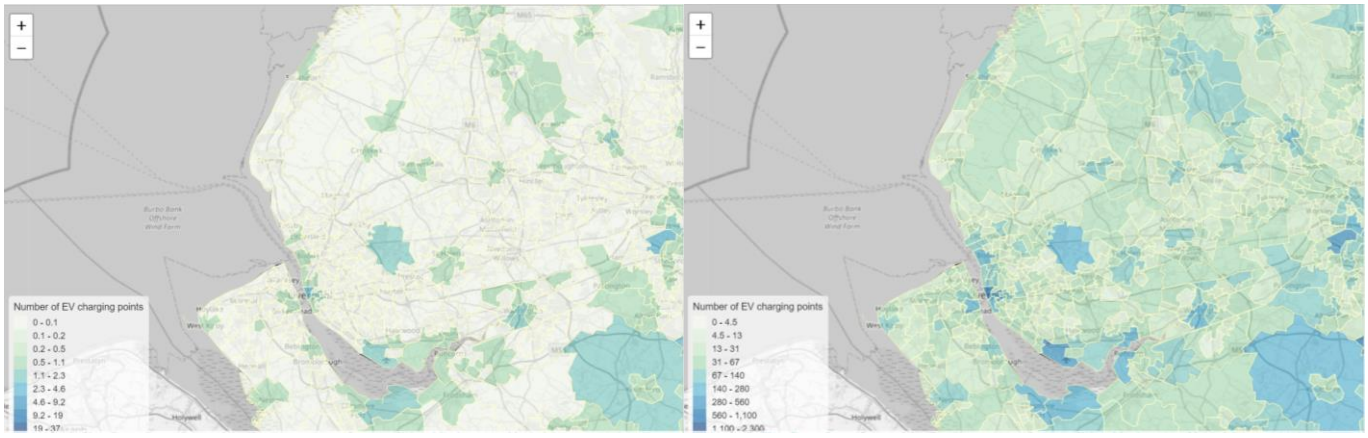
There is an increased link between transport infrastructure and energy infrastructure. The location of electric vehicle recharging has significant impacts on local energy networks, whilst green hydrogen production and refuelling hubs have their own considerations. Modelling by Transport for the North has been undertaken that shows the likely future demand for recharging infrastructure for zero emission vehicles, taking into account spatial planning, the electricity network / supply, and travel demand and electric vehicle uptake. This provides a useful reference source, emphasising the scale of increase of infrastructure that may be needed, highlighting the need for infrastructure at homes, on street (for those without off road parking), at destinations, and at workplaces; as well as considering HGV needs.

Increases and potential increases in zero emission vehicles and associated infrastructure



Source: Vehicle Licensing Statistics / Electric Vehicle Charging Device Statistics, DfT

2020 **2040**



Source: TfN EV Charging Infrastructure Framework, TfN

6.8 Comparison of the Liverpool City Region with London

Section 7 will focus on thoughts and data around the future transport mix for the Liverpool City Region, though first it may be useful to explicitly compare with London, which has arguably a very different product. There are a number of very good reasons for doing this comparison; firstly, London achieves lower levels of transport-based carbon emission per capita than the Liverpool City Region (0.9Kt per capita compared to 1.3). Secondly, as seen, London regularly tops the economic indicators including in productivity. There are a number of additional factors that sit behind these – as well as a number of flaws London sees which are less the case in the Liverpool City Region, but the scale and scope of London's transport network is regardless one enabler of the figures seen.

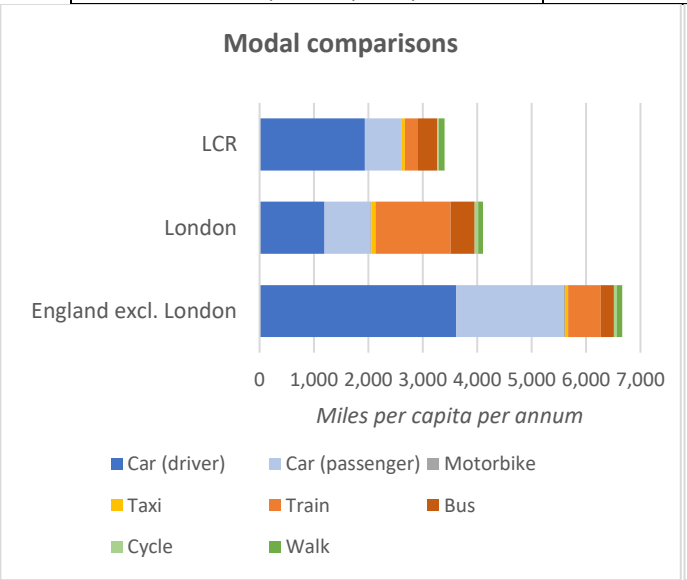
Certainly, there is much less driving in LCR than nationally although bear in mind the latter figures will also be heavily influenced by many rural areas. However, driving a car is almost double that seen elsewhere. Bus use is not too dissimilar to London, but rail use is significantly less. Partly this owes something to the wider connectivity of London's rail network – and that includes integration with bus. Note, these figures are based on distance travelled rather than trips in order to better align with the necessary carbon reductions and can thus reflect on modal choice for longer journeys including to hinterlands and beyond.

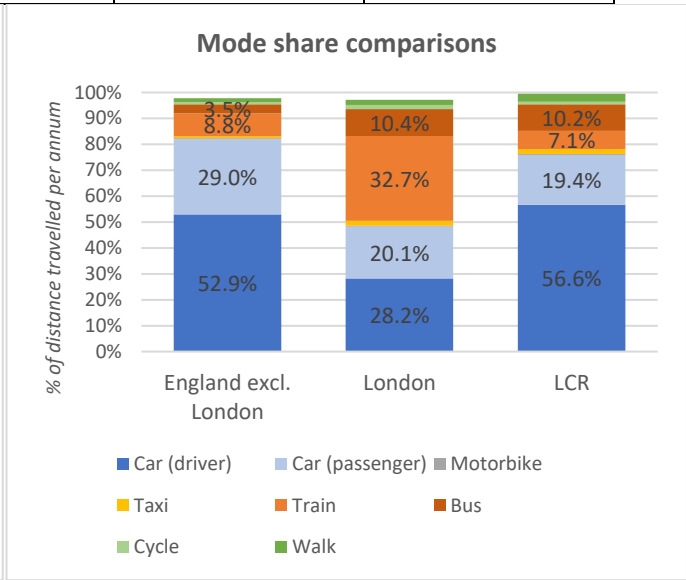
In this regards the Census is useful – locations of work and frequency of journey may have changed since the pandemic, but there is a distinct lower demand for public transport over longer distances in the Liverpool City Region. In terms of evidencing the vision, it may be worthwhile benchmarking against other European cities which the Liverpool City Region would like to aspire to, but for now this data provides some level of comparison.

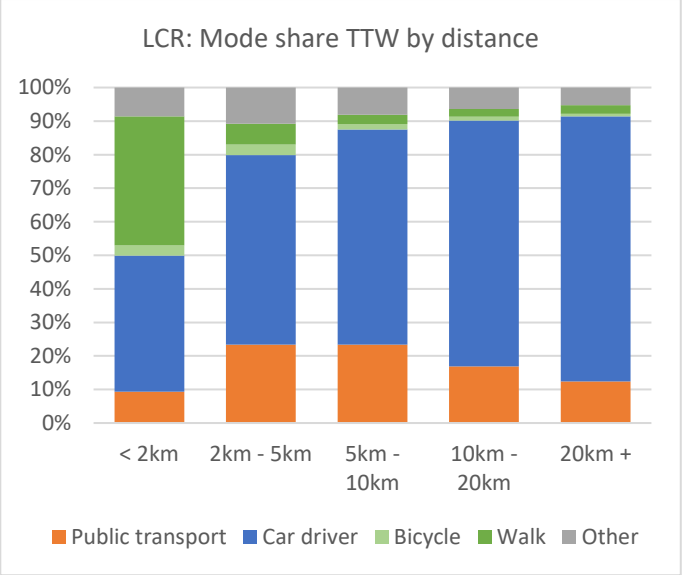
This shows user behaviour, but the flip side to observed demand is of course supply, and here there are evident differences. To some extent the comparisons may appear 'unfair' given the extensive reach of the London Underground network, but it should be remembered that where London is referred to this is Greater London, which includes many less dense areas. Overall, the LCR bus provision is some measure behind London, but ahead of the national average. In contrast rail provision falls somewhat below.

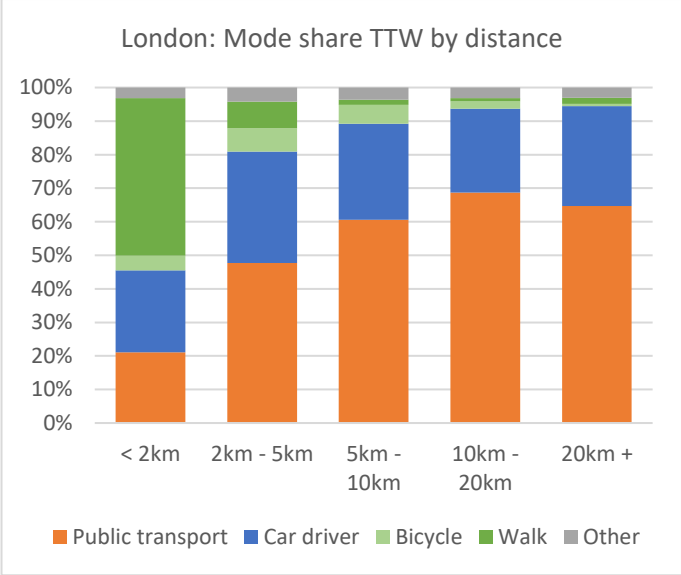
Public Transport and Mode Share: LCR and London

	London	Liverpool City Region	England
Bus km operated per capita	53.16	41.00	32.37
	London Underground + Overground	**Merseyrail**	**All GB Mainline Rail**
Train km operated per capita	9.33	4.16	8.49









Source: Countywide Survey, LCR CA 2017 / National Travel Survey, DfT, 2019

This section has shown a range of transport patterns affecting the Liverpool City Region, showing at a high level how it may be particularly important to consider mode shift, with some specific locations highlighted as needing attention. Levels of zero emission vehicle uptake – and associated recharging infrastructure – is also an important element here. All current patterns and historic need to be considered in the light of where we want to get to in a future transport mix – and the route to getting there will in itself be influenced by addressing user perceptions, connectivity, and freight issues. Clearly there are supply-side as well as demand-side issues to consider.

7. Future transport mix

In considering what aim there is for the future transport of the Liverpool City Region, addressing the current environmental, economic, and transport issues, there is a need to ensure this is forward looking. Uncertainty in both economy and transport demand is now far more of an issue before, and interventions to reach the vision and goals need to ensure this is addressed, as explored in this section.

7.1 Transport Vision and Goals

As indicated in the introduction, the purpose of this document is to provide evidence that supports and shapes the LTP. From an initial evidence assessment, the following draft vision and goals for transport in the Liverpool City Region were established.

DRAFT VISION	
"To plan for, and deliver a clean, safe, resilient, accessible and inclusive London-standard transport system for the movement of people, goods and freight in a way that delivers our economic, social and environmental ambitions, and in particular, a net zero carbon emitting city region by 2040 or sooner"	
DRAFT GOALS	
GOAL 1	Ensure that transport supports recovery, sustainable growth and development, and that our transport plan, Plan for Prosperity, Climate Action Plan and Spatial Development Strategy are fully aligned
GOAL 2	Achieve net-zero carbon emissions by 2040 or sooner, whilst safeguarding and enhancing our environment
GOAL 3	Improving the health and quality of life of our people and communities through the right transport solutions, including safer, more attractive streets and places used by zero emission passenger and freight transport
GOAL 4	Ensuring that our transport network and assets are resilient, responsive to the effects of climate change, and are well maintained
GOAL 5	Ensuring that we respond to uncertainty and change but also innovation and new technologies in the movement of people and goods

The evidence provided so far supports the importance of these goals. This section provides a focus on forward looking – and how Liverpool City Region might be moving towards these goals. This includes considering exogenous factors that may drive transport demand, before moving on to consider a number of plausible scenarios for transport before any additional interventions that may be necessary from the LTP.

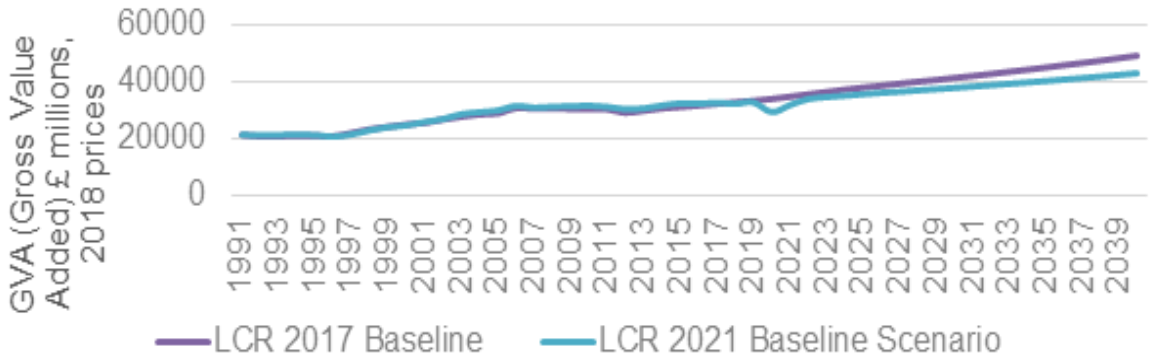
7.2 Liverpool City Region Combined Authority Economic Forecasts

The Liverpool City Region Combined Authority commissioned Oxford Economics to provide a range of economic forecasts. This builds on a similar range of forecasts developed by Oxford in 2017. This work has included both a baseline forecast and higher growth scenarios; the forecasts are primarily intended for a rage of uses within the organisation, but they are also used as inputs to the future travel demand scenarios.

Baseline Scenario Oxford values

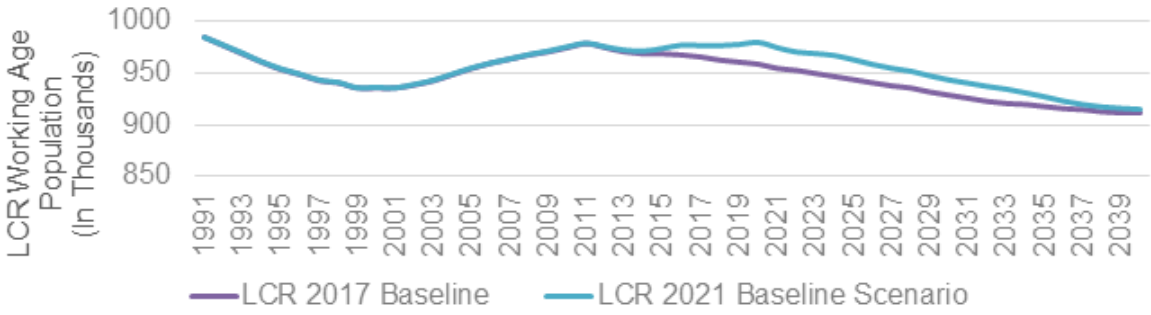
Growth for GVA since COVID (2020 values) in the 2017 baseline is 45% by 2040 compared to the 2021 model which has a 45.6% in the same time frame. This growth is only similar due to the 10.2% drop during 2019-2020.

The difference between the two estimated values by 2040 is 12.9% or £6.4bn, with the 2017 baseline scenario producing £49.4bn and the 2021 baseline scenario having £43bn.



An area that indicated the largest initial disparity was the working age population estimation. Differences between the models are 19,000 by 2025 but both align having the smallest difference from all models by 2040 with a change of 3,000 employees or 0.4%.

Both scenarios predict the lowest number of working age population within the Liverpool City Region from all available data showing a mean percentage drop of 2.4% from previous lows in 2000.

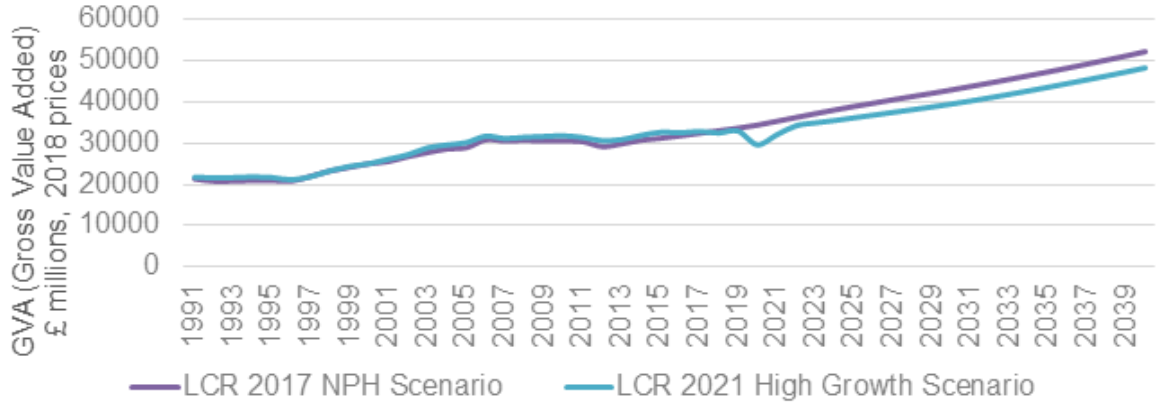


High growth scenario Oxford values

The Gross value-added comparison indicated that LCR did not meet the NPH 2017 scenario expectations for pre-COVID in the 2021 analysis, missing the target value by 2.4% for 2019. (The NPH scenario created in 2017 was a scenario based around emulating the transformational growth expected for the North as a whole in the Northern Powerhouse Independent Economic Review.)

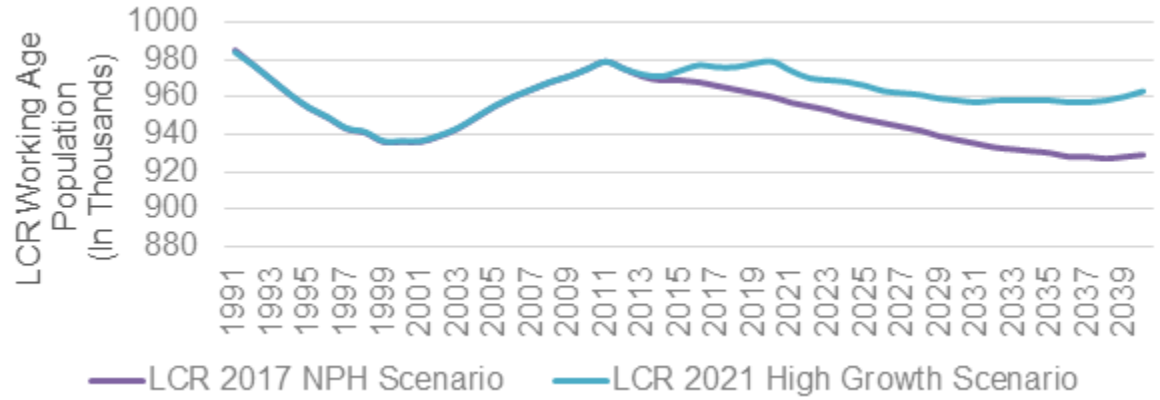
Growth for GVA since COVID (2020 values) in the highest growth scenario is 63% by 2040 compared to the NPH 2017 model which has a 52% in the same time frame.

Latest forecasts suggests that GVA levels could reach £4.8bn by 2040 showing a 7.7% less than anticipation from the previous forecast.



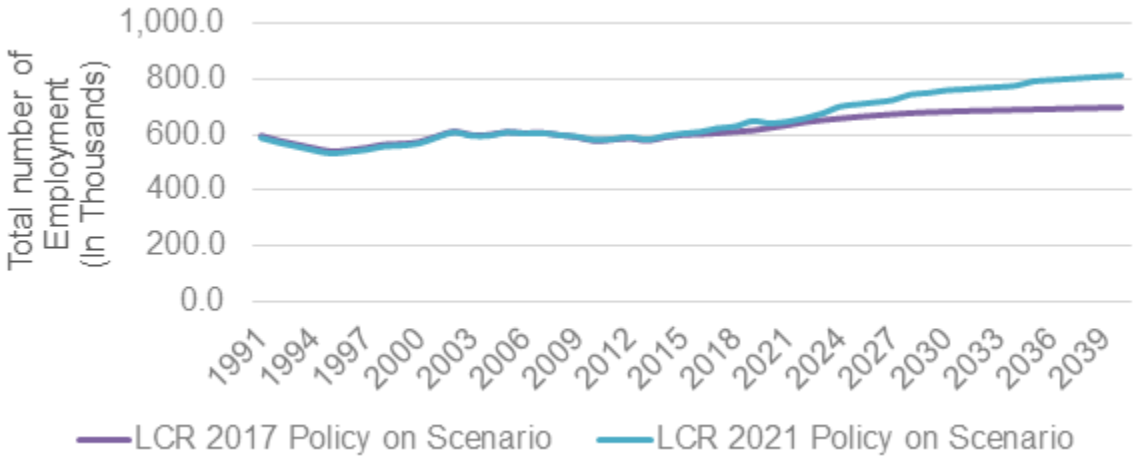
An area that indicated the largest disparity was the working age population estimation. Differences between the models are 18 thousand by 2025 and increase to 34 thousand by 2040.

The high growth scenario predicted a larger number of workers within the Liverpool City Region with a difference of 3.5% by 2040 in comparison to the NPH model.



Policy on Scenario Oxford Economics

The total employment estimation for the 2017 policy on scenario was lower than the actual values in the 2021 model with a difference of 35 thousand in 2019. The reduction from COVID did affect employment numbers comparatively to other metrics as the -1.2% reduction in employment in 2020 was fully recovered by 2021 and surpassed previous 2019 highs in 2022.The overall percentage difference in 2040 between both models is projected to be 16.6%.



R&D expenditure worth to be 5% by 2030

Eurostat data (2019) shows, that between 2011 and 2017, the Liverpool City Region R&D as a share of GVA grew by 7.4% per year from 1.5% to 2.4%. To reach 5% by 2030, we would require annual growth of 9.5% between 2019 (latest data) and 2030.

Liverpool City Regio Spatial Development Strategy

The Spatial Development Strategy (SDS) is a statutory land-use planning document that will set out a framework for building and development in the LCR looking ahead for at least the next 15 years.

The SDS must only deal with planning matters that are of strategic importance to the Liverpool City Region. These may not affect all areas, but will have significance for the wider interests of the city region, including transport.

Key strategic planning matters include:

- Housing
- Economy and employment
- Town centres
- Infrastructure
- Natural and historic environment

The current SDS is under development and consultation and will be adopted in the next few years.

7.3 Future Travel Demand Scenarios for the Liverpool City Region

The overall vision shows where LCR wants to get to in transport terms, and the economic intelligence shows the wider issues to be dealt with as part of this. In order to better quantify the challenges the LCR may face in transport terms, a number of future travel demand scenarios have been produced. No one of these scenarios is a specific future we want to get to; rather they show a range of plausible futures that may exist. These scenarios show the realistic range of gaps between where LCR wants to get to and where 'doing nothing' gets us to, and hence what transport policies and interventions may be needed – for example, what additional action is likely to be needed in order to achieve net zero.

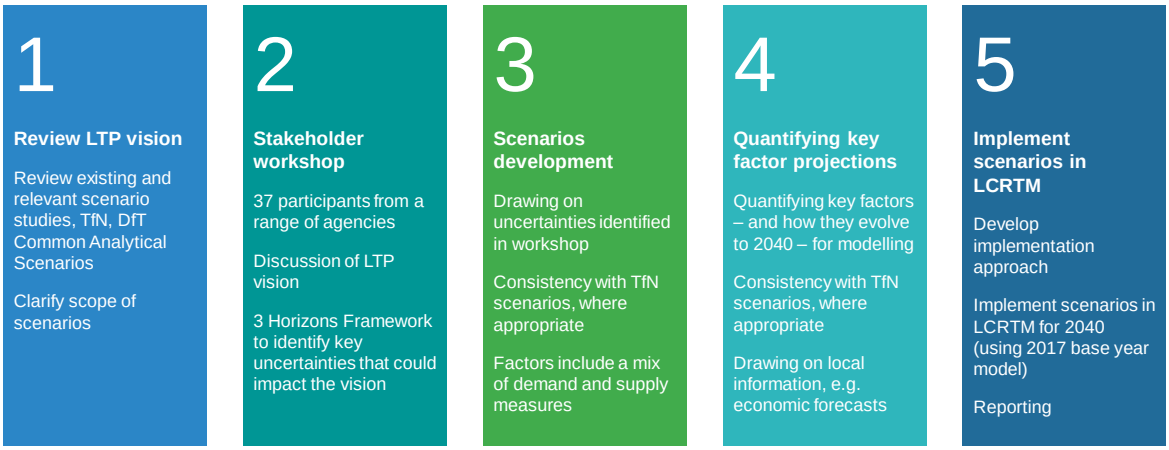
The scenarios were developed following recommendations in the Government Office for Science futures toolkit, identifying the key areas of uncertainty likely to impact on transport demand in the Liverpool City Region, using local data where possible to explore the plausible scale of change in these key areas. There are two strands to such scenarios: qualitative and quantitative. The quantitative element measures the extent and nature of changes in travel demand – in this case by 2040, to align with the LCR's net zero ambitions – and provides data useful in further modelling. The qualitative element paints the picture of each individual scenario, providing a clear narrative for a wider audience, including those areas which are not able to be quantified.

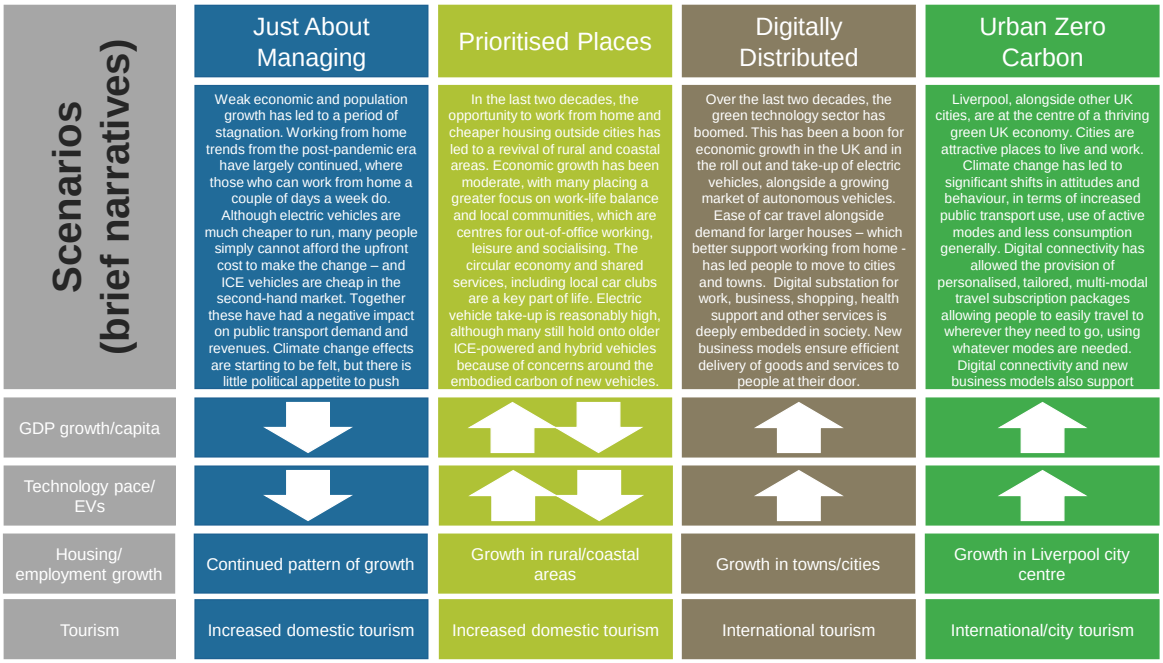
At an early stage in identifying the areas of uncertainty, it was realised that there was a strong overlap with the Transport for the North travel demand scenarios, and hence where appropriate consistency was applied. (For example, the four scenario names reflect those used in the TfN work.) Multiple local data inputs were used to reflect exogenous and endogenous factors, including the latest LCR CA economic forecasts which provide both a positive and negative view of economic growth, the most recent transport data, and data from the Liverpool City Region Transport Model. This was also supplemented with data from TfN modelling where no local data was available.

On the demand side of the modelling, all scenarios assume a certain amount of home working continuing, although this varies between each scenario. Amongst key supply side elements, the extent to which there is an uptake of zero emission vehicles and the level of adoption of automation also varies across each scenario.

A fuller technical report is available, exploring all this in more detail. The broad process is shown, together with the resultant narrative of the individual scenarios.

Future Transport Demand: Process of developing and resultant scenarios for the Liverpool City Region





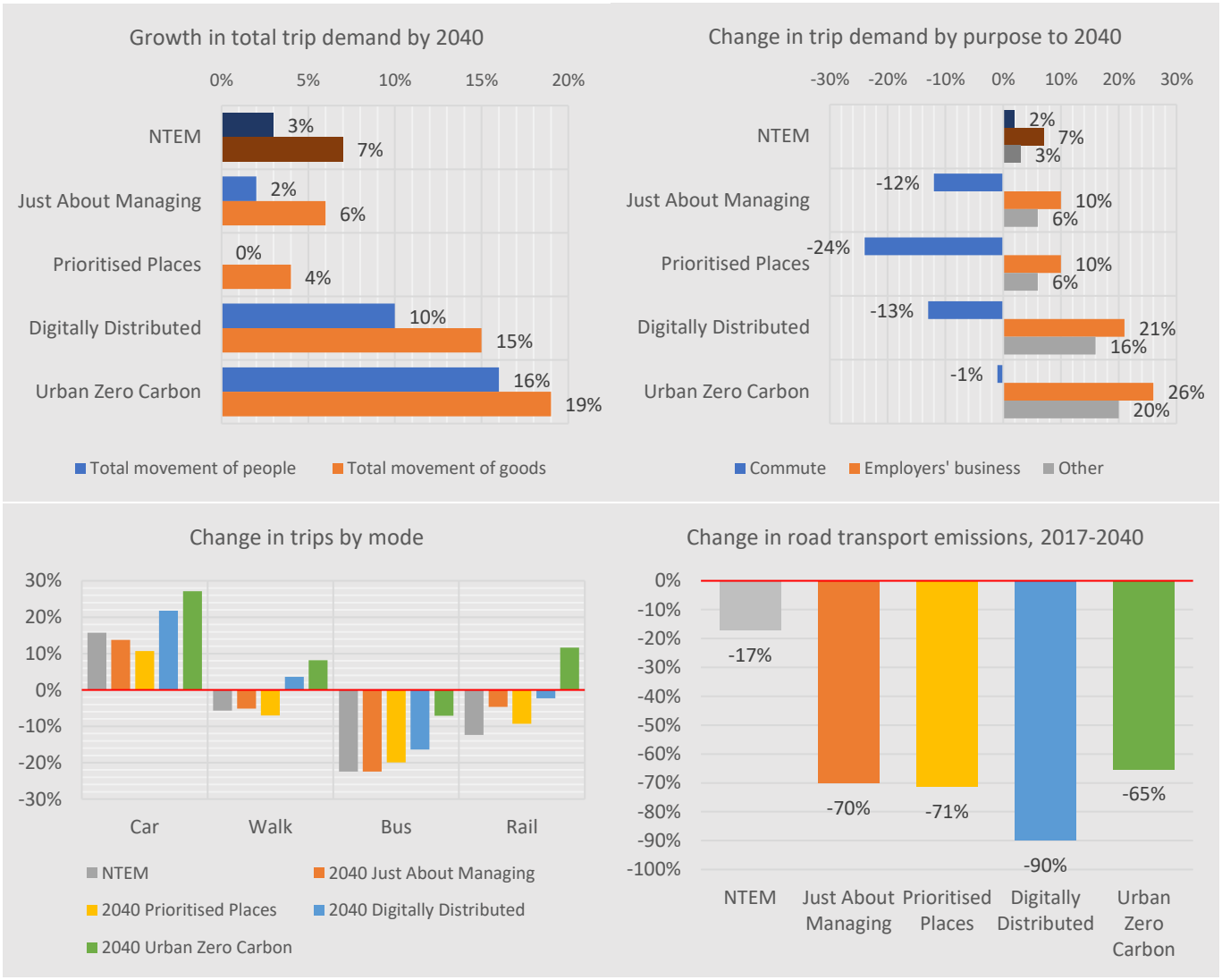
Liverpool City Region transport scenarios

The results do not underestimate the challenges facing the Liverpool City Region, with the overlapping drivers of demand resulting in a growth for movement of both people and goods in most of the scenarios. This level of change is contrasted to the DfT's NTEM forecasts showing the range of uncertainty that exists, although it is clear that across all scenarios commuting travel is likely to be somewhat lower than it was. Most importantly for the LTP, there exists a continued growth in car trips to 2040 of between 11% and 27%. The estimates for what these mean for net zero vary, depending both on the demand in trips and levels of uptake of zero emission vehicles by 2040. The forecasts indicate the gap to net zero for transport could be between 10% and 35% - i.e., transport in the Liverpool City Region will only reach a reduction of between 90% and 65%, not the 100% required. As has been seen in Section 5, even without the consideration of carbon emissions there is a need to react to the risks of increased non-carbon emissions to health and of increased congestion to the economy. Given that most scenarios show continued decline in public transport there is a need to consider what needs to be done to redress this balance.

Each scenario suggests a different level of change to be achieved in order for the Liverpool City Region to reach the vision in the LTP – bearing in mind these already include to some extent a reduced need to travel due to working from home. However, each mode has its own strengths and

weaknesses, and where these may lie for the Liverpool City Region – and hence where solutions may be needed – is provided in Section 8.

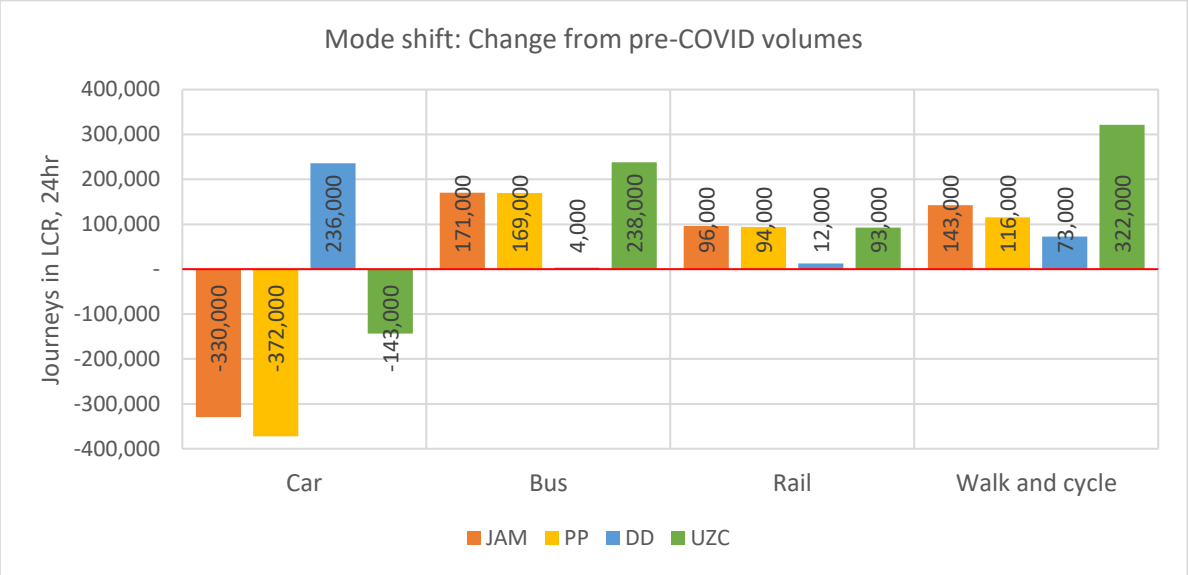
Key outputs of Transport Demand scenarios

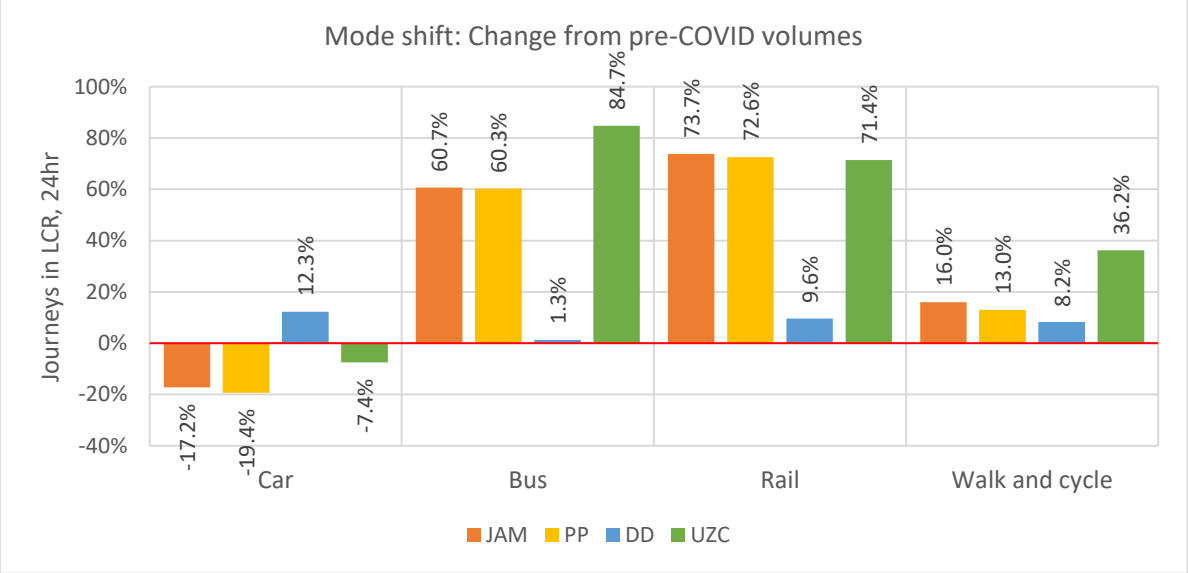


Source: Changes indicated in the four future travel demand scenarios. Mott MacDonald for LCR CA
NTEM = National Trip End Model (DfT) v7 – values since updated

A key question here is what does this mean for the LTP? Clearly mode shift becomes important to close the gap to net zero, bearing in mind that the scenarios already have working from home and other factors that represent reduced need for travel embedded in their modelling. Further work has been undertaken to estimate the levels of mode shift required, based on both the 'gaps' presented and travel patterns implied in each scenario. A particular focus on this includes distances travelled, with active travel more implicit in shorter distance journeys, and rail more implicit in long-distance public transport journeys than bus. The results are detailed in the charts below, both in percentage terms and absolute numbers that reflected a typical 14-hour period.

Mode shift to achieve net zero





Liverpool City Region Transport Demand Scenarios
Note, demand is relative to 2017 levels, and includes estimates for COVID impacts such as working from home

In one of the scenarios – where it is assumed 95% of total vehicle fleet is comprised of zero emission vehicles – some growth is assumed able to continue in car use, with relatively lower levels of mode shift required. Most scenarios indicate a requirement of mode shift, and that at substantial volumes.

- Levels of car trips will likely need to have reduced by between 7% and 19% relative to pre-COVID levels of demand.
- Bus trips will likely need to increase by 60%-85%.
- Rail trips will likely need to increase by between 71%-74%.
- Cycling and walking trips will need to increase by between 8%-36%.
- The need to reduce emissions from freight is also a factor, with uncertainty over levels achievable by 2040.

It should be emphasised that the above mode shift is calculated *only* regarding the need to meet net zero. For example, if the levels of car traffic still include areas of congestion, measures to deal with this are not included; nor are improvements in transport to meet specific investment zones or to

tackle transport related social exclusion. Thus, the mode shift numbers may be viewed as a starting point. It should also be noted that given the nature of the modelling, whilst these results are reflective of movement patterns within the city region, mode shift may need to be proportionally higher on the longer 'cross-border' trips.

Analysis continues to understand where the scenarios indicate mode shift may be most relevant; although there is a range of existing evidence withing this paper indicating much of this, which would include:

- Areas of high car ownership
- Areas of weakness in the public transport offer
- Areas at risk of transport-related social exclusion
- Key attractors of travel demand

The scenarios point to a range of futures, with a wide range of potential differing levels of transport demand that the LTP will need to consider. The scenarios consider differing factors, including differing economic performance, varying levels of working from home, technology uptake, and behaviour change amongst other elements. However, there is one clear message from across all scenarios: 'do nothing' is not an option, with significant levels of mode shift needed to address current and future levels of road traffic, without which net zero will not be met – and air quality and congestion continue to impact the economy and communities of the Liverpool City Region.

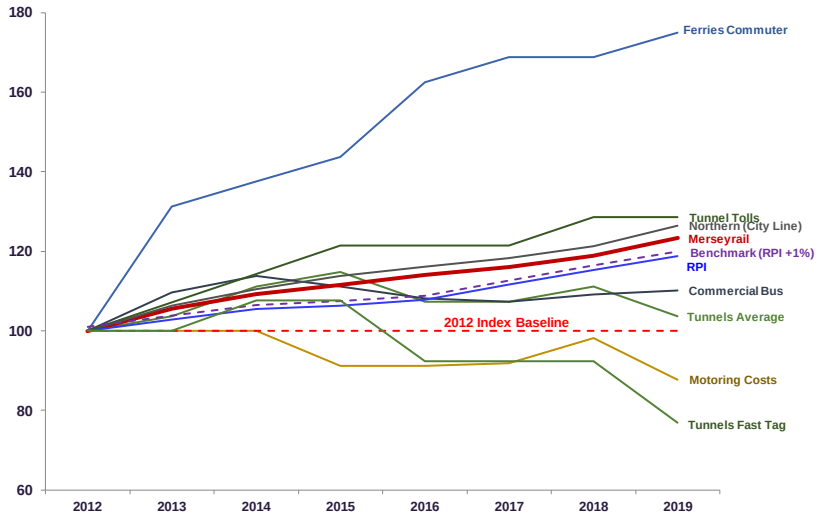
Section 8. The customer experience

Key to achieving change on the transport network lies in understanding the customer experience – in its wider sense, and hence what needs to be overcome. This section provides information on satisfaction levels with transport as well as wider attituded – and this includes ongoing COVID concerns. It also reports on wider supply side issues as experienced by customers, including transport costs and the levels of connectivity offered by public transport.

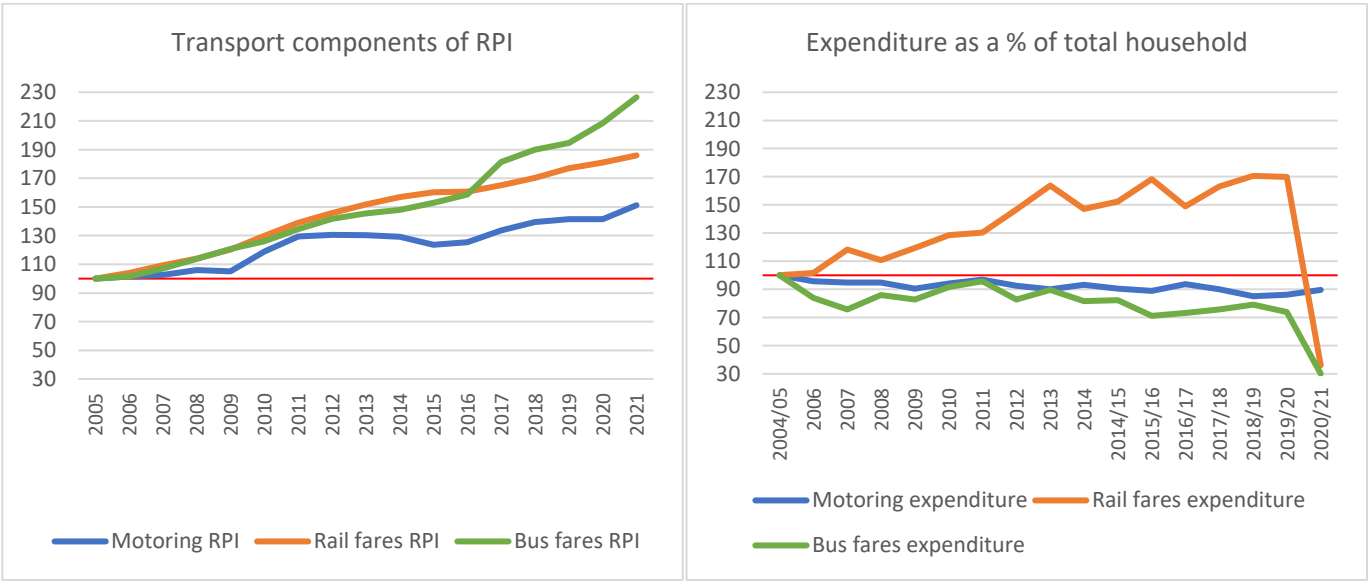
8.1 Transport costs

A significant element of transport use and satisfaction inevitability is cost. Local data up to 2019 suggested ongoing increases in bus and rail fares whilst motoring costs fell, a picture replicated nationally. Recently fuel prices have shown an increase which impacts on motoring costs – and although only part of the overall cost, is often the most visible on a regular basis. Nevertheless, this is unlikely to have dispelled the differentials in perceived and actual cost.

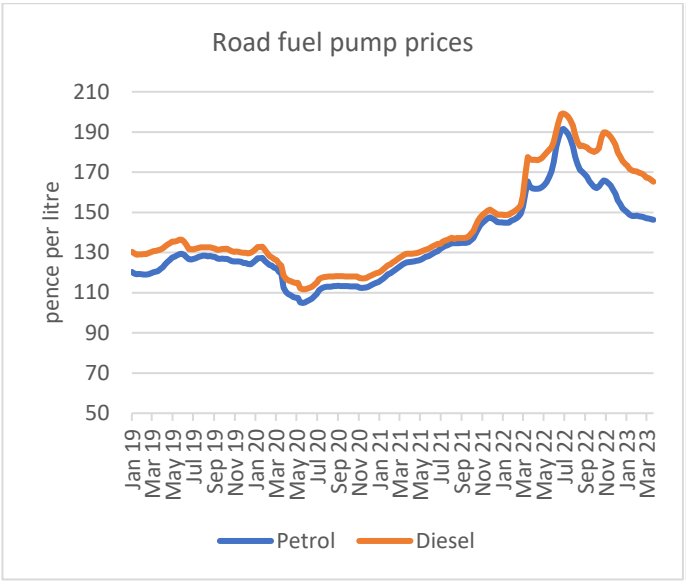
Trends of change in personal travel costs

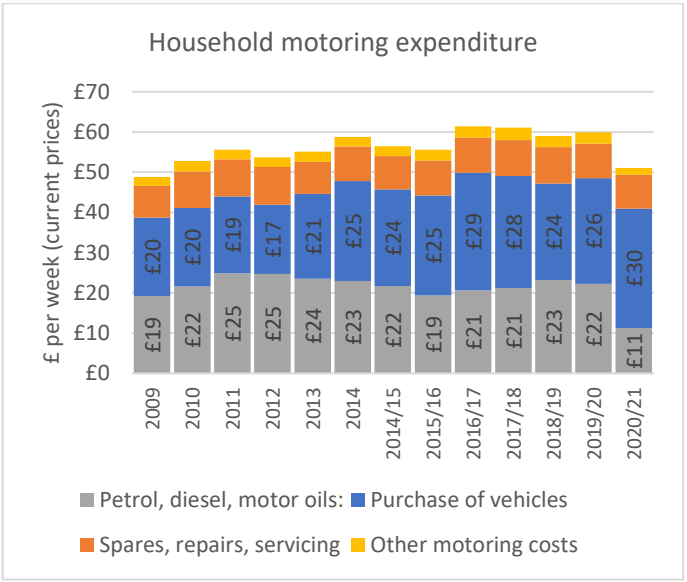


Source: LCRCA, Affordability dashboard



Source: Transport Statistics Great Britain, DfT





Source: Weekly road fuel prices, BEIS / TSGB 1306

8.2 Passenger Satisfaction

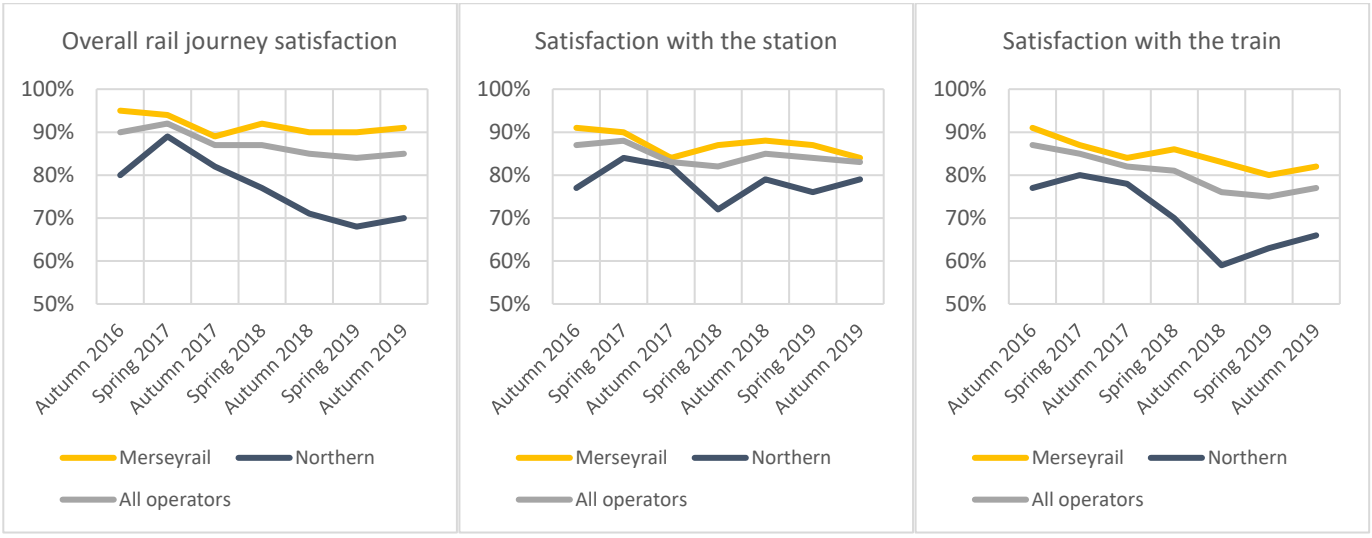
Key to monitoring satisfaction with public transport are the regular surveys run by Transport Focus. As might be expected, these were suspended during COVID and are only now being re-established, so the most recent data covers up to 2019, but still provides insight. It is important for the LTP to be aware of particular strengths and weaknesses displayed in these surveys, as they may represent particular attractors or deterrents to public transport.

So, for example it is worth noting that Merseyrail regularly outperforms the national averages in satisfaction, with particular drivers being the frequency / punctuality / connectivity of the journey, as well as information levels and staff on stations. Areas of weakness were more likely to be car parking, facilities on stations such as shops and toilets, visibility of staff on trains and modern on-board facilities such as internet and power sockets – some of which of course will be addressed by the new Merseyrail rolling stock. Although the comparison with Northern can be a bit misleading (see notes), there is clearly a weakness in many of these regards, especially in term of frequency and punctuality.

By contrast, bus services in the Liverpool City Region tend to be slightly though not significantly above national averages. Key factors driving satisfaction with bus journeys are the convenience of the bus stop, ease of boarding/alighting, journey times, and driving standards. Lower levels of satisfaction cover issues such as conditions at the bus stop, value for money, on-board information and driver helpfulness.

In all this it should of course be realised that this level of perception comes from public transport users – in order to achieve mode shift, understanding non-users' perceptions become more important.

Rail Passenger satisfaction



Source: National Rail Passenger Survey, Transport Focus

Note: "Northern" figures shown covers the 'West' part of the franchise, including routes around Liverpool, Preston and Cumbria, and hence does not relate solely to Liverpool City Region.

Rail passenger Satisfaction

	Merseyrail	Northern (West)	All operators	
Ticket buying facilities	87%	75%	79%	At the station
Provision of information	91%	83%	85%	
Upkeep / repair	80%	72%	73%	
Cleanliness	82%	74%	76%	
Toilet facilities	52%	47%	50%	
Availability of staff	81%	69%	69%	
Attitude / helpfulness of staff	89%	81%	78%	
Connections with other public transport	78%	67%	79%	
Car parking	64%	60%	49%	
Bicycle parking	82%	73%	60%	
Personal security	81%	79%	73%	
Station environment	81%	79%	75%	
Shelter facilities	84%	72%	73%	
Availability of seating	66%	63%	53%	
Choice of shops + eating/drinking facilities	48%	40%	51%	
Availability of wi-fi	41%	28%	37%	

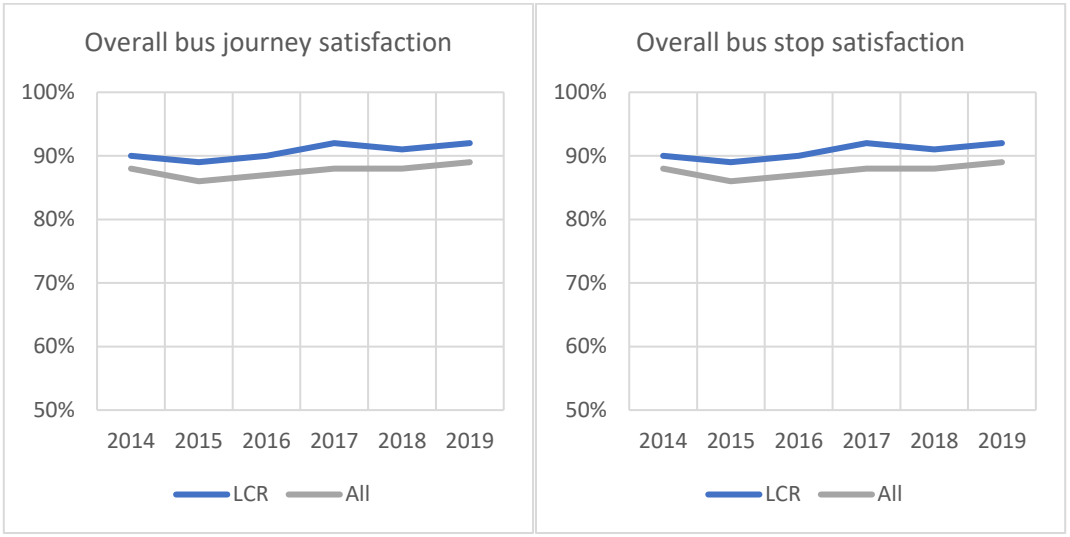
	Merseyrail	Northern (West)	All operators	
Frequency of trains	93%	57%	76%	The train service
Punctuality / reliability	91%	52%	74%	
Length of journey time	94%	74%	83%	
Connections with other trains	86%	66%	77%	
Value for money	67%	52%	47%	
Trust in train company	71%	29%	42%	

	Merseyrail	Northern (West)	All operators	
Inside Cleanliness	74%	67%	76%	On the train
Outside cleanliness	59%	70%	73%	
Upkeep	72%	65%	75%	
Level of crowding	76%	71%	71%	
Provision of information	85%	69%	76%	
Availability of staff	53%	64%	43%	
Helpfulness and attitude of staff	71%	76%	66%	
Luggage space	55%	58%	58%	
Comfort of seats	68%	65%	65%	
Space for bikes	56%	51%	43%	
Gap between train and platform	63%	54%	64%	
Personal security	73%	70%	74%	
Internet connection	22%	36%	35%	
Power sockets	7%	37%	38%	

Source: National Rail Passenger Survey, Transport Focus

Note: "Northern" covers the Northern West part of the franchise, covering routes around Liverpool, Preston and Cumbria, and hence does not relate solely to Liverpool City Region.

Bus passenger satisfaction



Source: Bus Passenger Survey, Transport Focus

Bus Passenger Satisfaction

	LCR	England	
Distance from journey start	81%	85%	Bus Stop
Convenience / accessibility	89%	89%	
Condition / upkeep	77%	75%	
Freedom from graffiti / vandalism	78%	79%	
Freedom from litter	75%	74%	
Information provision	76%	74%	
Personal safety	80%	79%	

	LCR	England	
Waiting time	78%	75%	Journey factors
Punctuality	77%	74%	
Journey time	87%	85%	
Value for money	73%	64%	

	LCR	England	
Route / destination information	84%	85%	Boarding the bus
Exterior cleanliness	81%	80%	
Nearness to kerb	93%	92%	
Ease of getting on	91%	91%	
Time to board	91%	90%	
Driver appearance	91%	91%	
Driver greeting	77%	76%	
Driver helpfulness / attitude	77%	77%	
Time to get to seat	79%	82%	

	LCR	England	
Interior cleanliness	83%	79%	On the bus
Information provided	70%	69%	
Availability of seating	88%	87%	
Seat comfort	81%	79%	
Personal space	78%	79%	
Grab rail provision	85%	85%	
Temperature	79%	79%	
Personal security	85%	85%	
Smoothness	80%	79%	
Safe driving	89%	90%	
Ease of getting off	90%	89%	

8.3 Connectivity

A further factor of importance in satisfaction with public transport and its use revolves around *Connectivity*. Connectivity at its simplest level is about defining 'how well connected' an area is. Rather than being an abstract concept, connectivity is a key element in encouraging mode shift – it can tell us a lot about how easy (or not) a journey may be, how 'attractive' different destinations may be, and where there may be strengths and weaknesses in a network. All of this needs to be viewed against potential user 'desire lines' and is not something easily picked up from satisfaction surveys. Connectivity is a wide-ranging topic for which a separate paper is available, but there are a number of key points within the existing work which form useful intelligence for LTP4.

There are four particular spatial elements which are evidenced by LCR CA:

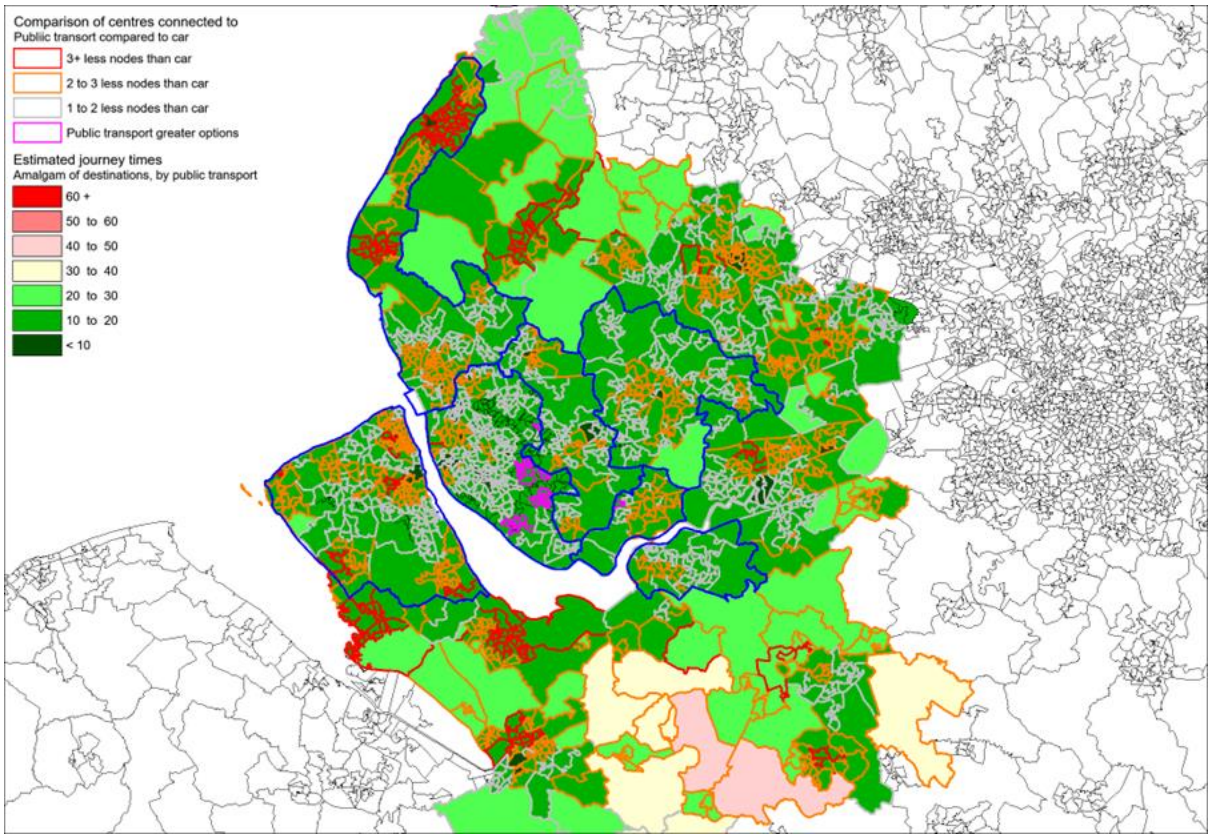
1. Connectivity at a local level – comparing the ability of people to access a range of services by public transport and walking / cycling with the level afforded by car use.
2. Connectivity at an LCR level – comparing levels of connectivity between key centres which make up the Liverpool City Region
3. Connectivity to / from the hinterland – Section 6 has highlighted the significant levels of journeys to/from a wider area, so analysis is presented on how well key hinterland centres are connected both to their nearest part of LCR and to Liverpool city centre.
4. Long distance rail connectivity – comparing a range of key cities across Great Britain in terms of how well they are connected by passenger rail.

In most cases connectivity is presented in percentage terms – how well connected an area is compared to an 'ideal' level of connectivity – with separate explanations given where necessary.

Local level connectivity

Local level connectivity is based on the numbers of key centres and services which residents can access within a 30-minute journey. This is based on DfT accessibility data, which has been modelled and weighted through using local surveys including the Countywide survey. The data provides an understanding of catchments, but more importantly flags up where the public transport offer is significantly weaker than the car offer. For much of the city region the level of connectivity is often comparable with that achievable by the car, but there are a number of areas where this is significantly weaker. Areas of focus include (but are not limited to) Heswall, Wallasey, parts of Widnes and St.Helens, Bootle and Crosby, and elements of North Sefton. These areas of relative weakness may drive car use and ownership (pun intended); and it is important also to be aware of what this looks like for the hinterland.

Local-level connectivity: a number of areas where PT compares poorly to car



Mapping of Local Connectivity: modelling of DfT Journey Time Statistics / Countywide survey

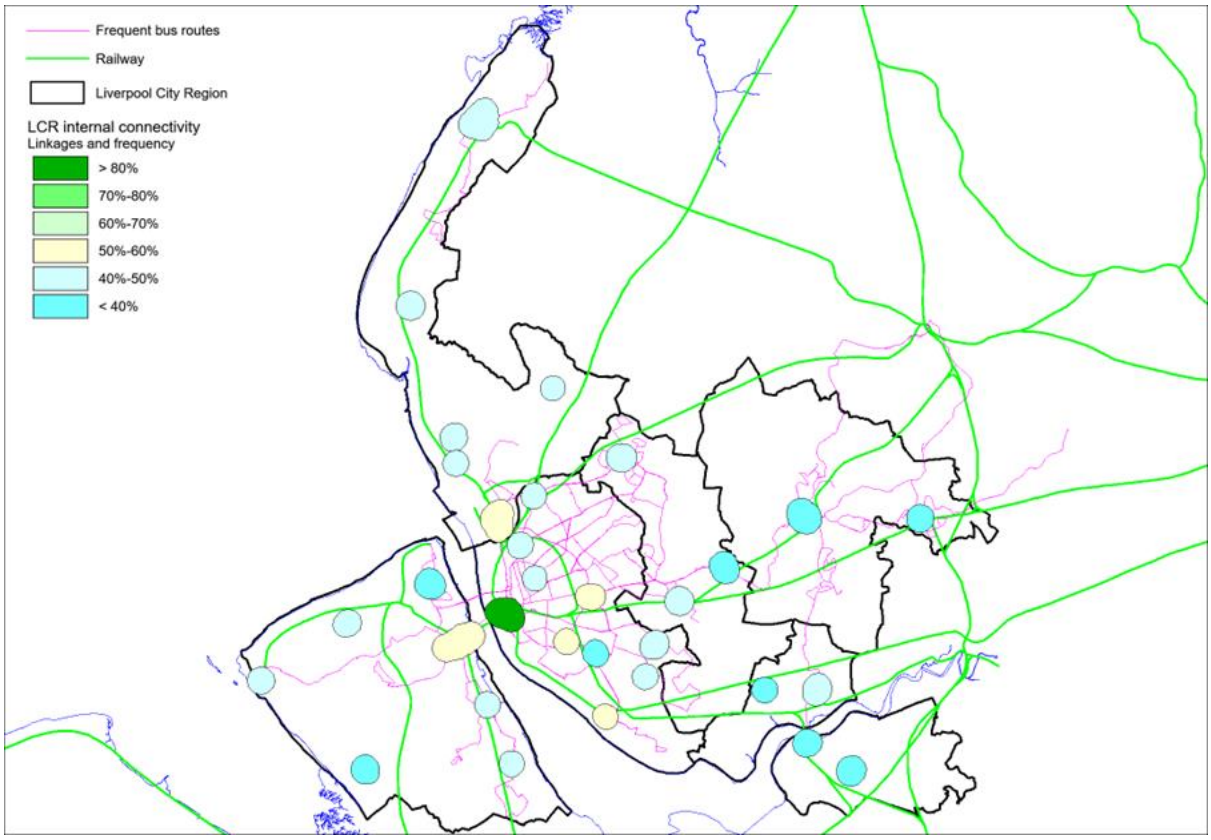
Connectivity between centres

Connectivity between local centres in the Liverpool City Region enables us to focus more in terms of key linkages and where improvements may be needed. This work includes elements of considering levels of interchange necessary to make a journey as well as the frequency of service provision. Mapping is provided here for weekday daytime, but in terms of encouraging mode shift this is weaker in many cases during evenings and Sundays. Areas of severe weakness often align with the findings we noticed on the previous map, although detailed examination of the underpinning statistics suggests a few areas which drive the numbers lower – these include but are not limited to:

- Poorer frequency of rail services on the City Line when compared to the Northern and Wirral Line
- Lack of integration between bus and rail, including in the city centre for those making cross-city journeys.
- For those areas without a rail station, lower frequencies, journey times and/or multiple interchanges needed when using bus.

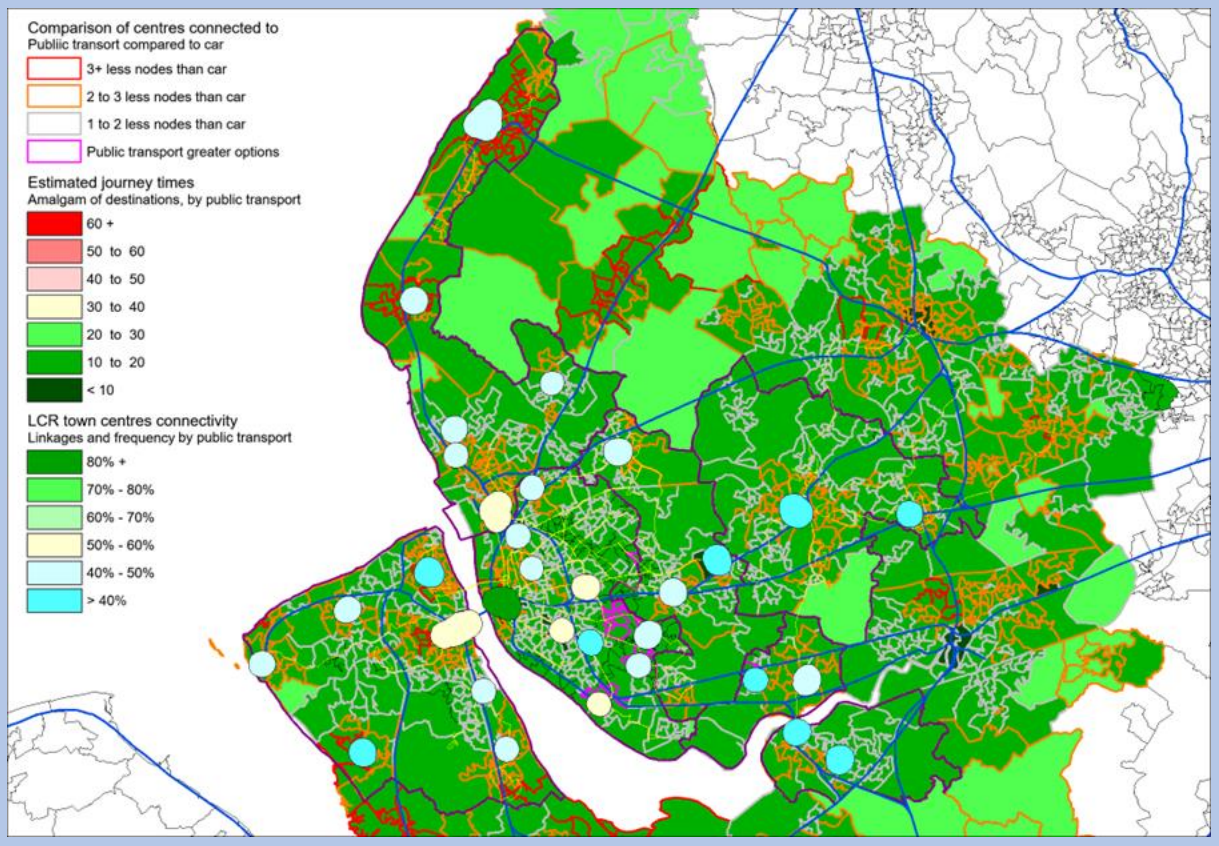
When these two datasets are spatially merged it enables us to see those areas which may be in need of attention, with the poorer public transport connectivity at risk of enforcing transport related social exclusion (see Section 10) and embedding car use.

Connectivity (incl frequency) between LCR Town Centres: particular concern away from the city centre



Modelled public transport connectivity of key centres within the Liverpool City Region: Times and Frequencies

Composite local and inter-centre connectivity



Combined public transport connectivity of key centres within the Liverpool City Region with local connectivity; overlays of rail network and frequent bus routes

The composite map presents with a broad brush both local and inter-centres connectivity as a further aid to portraying areas of concern.

Data is available behind the analysis to enable an understanding more specifics of exactly where linkages are week, including active travel measures, but the overall principles outlined above apply:

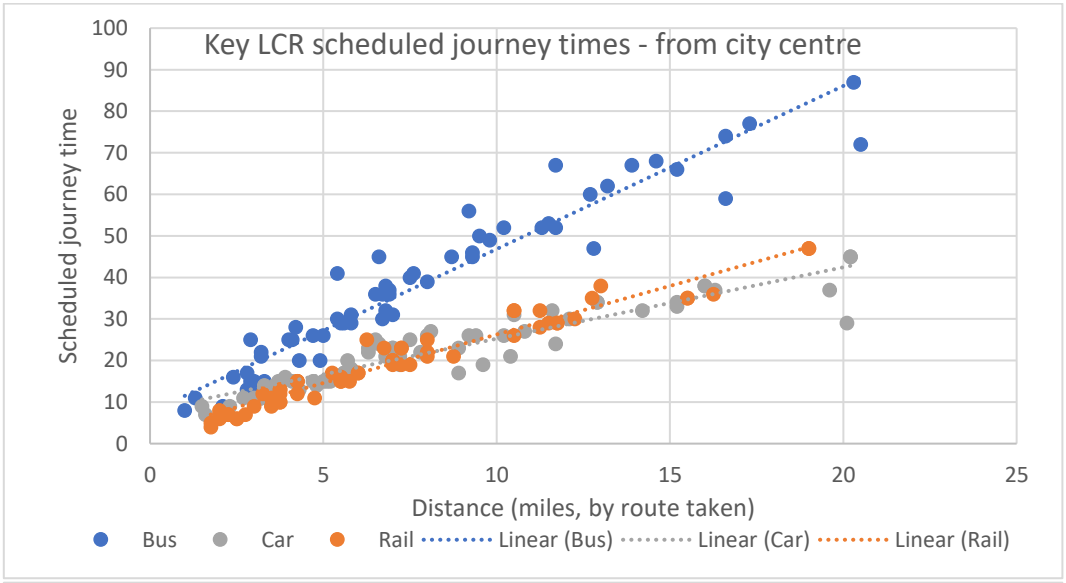
- Frequencies are important.
- Integration and improved interchange matters.
- Active travel and the availability of facilities play a role at local level, but not in longer distance journeys.
- Both areas of high car ownership and areas more reliant on public transport are important.
- Journey time overall is also an important element of connectivity as shown below.

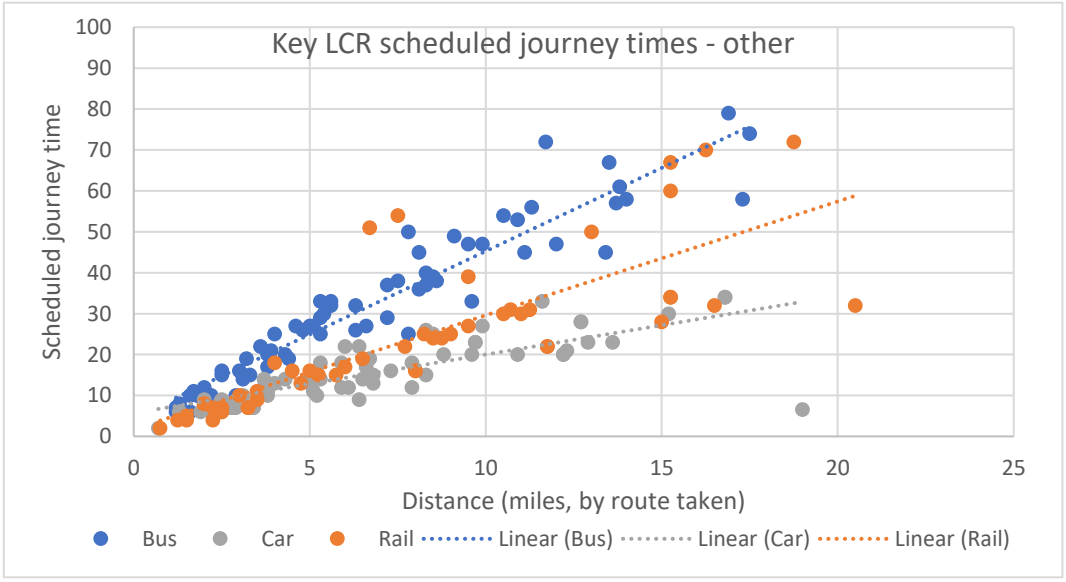
Within the connectivity research, the analysis presented in this report has concentrated on journey opportunities and frequencies. In order to simplify these maps, a key element not included is journey time. The charts below present companion data for this, with a range of journey times for different modes (comparing car and rail with key bus routes). The top chart relates to journeys from the city centre, the lower chart journeys from other centres.

On journeys from the city centre rail is generally competitive with the car, especially on longer journeys. By contrast bus is generally performing not too dissimilarly up to 5 miles, but beyond this the divergence becomes much more marked. A very similar pattern is marked when observing journeys from other centres. Although here rail is not always as competitive with the car, mainly owing to the impacts of interchange, whilst at the same time car journeys tend to be faster than from the city centre.

In terms of mode shift there are some key implications here in terms of building on each mode's strengths; including attracting longer distance passengers to rail, shorter distance passengers to rail, improving bus journey times; but in particular what can be done to improve interchange, to enable a more competitive public transport offer overall.

Journey times and public transport's competitiveness





Source: Journey time data from Liverpool City Centre and other LCR centres
Note: only direct bus routes have been calculated, whereas for some rail journeys interchange is included

Hinterland connectivity

Moving to consider issues beyond the borders of the Liverpool City Region, there are separate issues in terms of both our hinterland and further afield. This is an important aspect of moving towards net zero and encouraging modal shift, for if people find they need a car for these longer distance trips, then it is also more likely also to be used for shorter distance trips too. More detailed analysis of the Countywide Survey results helps to illustrate this, with public transport for external journeys being half what it is for internal journeys, and car trips accounting for 87.7% of external journeys compared to 56.0% of internal journeys.

The same dataset also shows increasing car ownership increases the likelihood of car use; and that households with no car availability are far more likely to be using taxis, which may indicate that through cost, connectivity, accessibility or schedule the public transport network is not meeting their needs – increasing the risk of Transport Related Social Exclusion (see Section 10).

Thus, overall, besides improving internal connectivity there is an urgent need to consider external connectivity, especially as regards to public transport – and particularly rail or multimodal where greater journey time benefits can be achieved over distance.

Comparison of mode share: 'internal' vs 'external' journeys

	Internal / External mode split			Mode split by household car availability		
	Internal LCR Trips	Trips to/from LCR		No cars/vans	1 car/van	2+ cars/vans
Car Driver	40.5%	66.2%		-	45.7%	52.5%
Car Passenger	15.5%	21.5%		13.9%	24.4%	20.1%
Taxi	3.2%	1.2%		8.8%	3.3%	3.9%
Public transport	14.1%	7.0%		25.9%	7.9%	4.0%
Active Travel	25.4%	1.4%		50.0%	18.2%	19.5%

Source: Countywide Analysis, 2017

Much of the hinterland (with the notable exception of North Wales) shows relatively strong connectivity to Liverpool itself, and this is often reflective of the reach of the Merseyrail network beyond Liverpool City Region boundaries. However, their connectivity to their 'nearest neighbours' can be somewhat patchier; external links to/from St.Helens and Halton looking particularly weak. Note that frequencies as well as levels of direct linkages can be an issue.

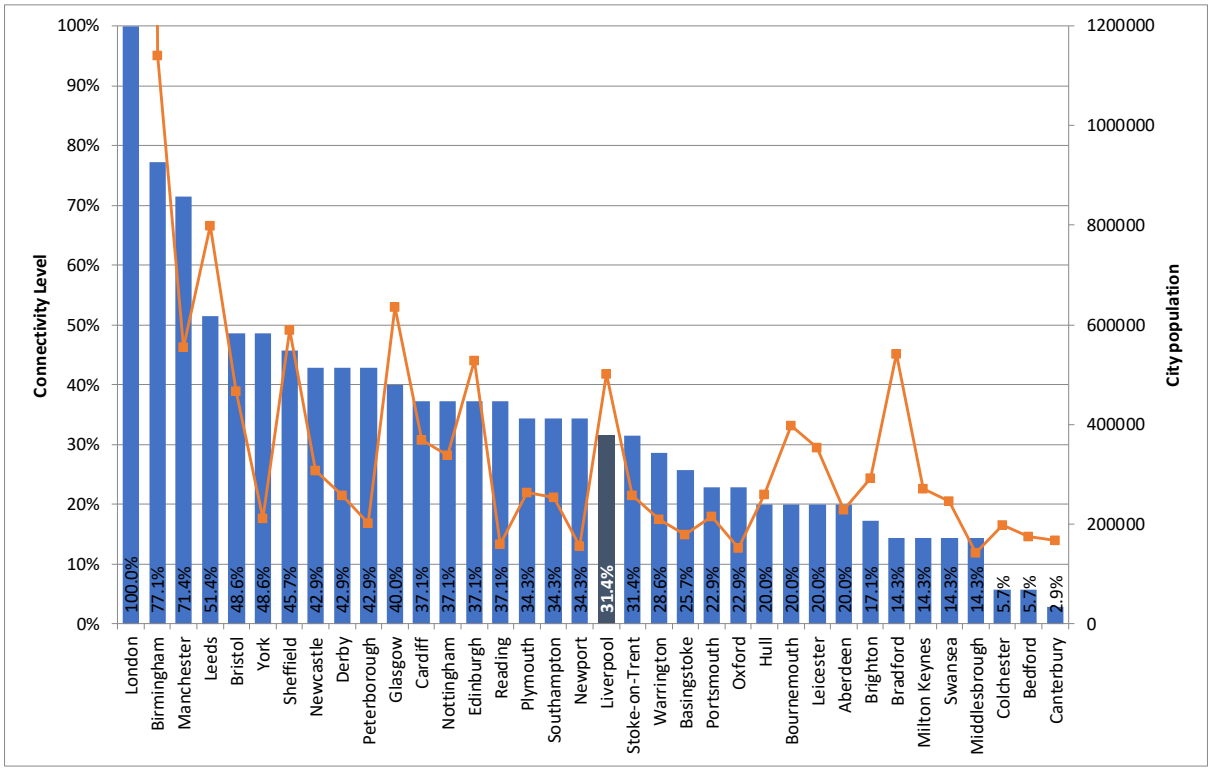
Connectivity to/from key nodes in the LCR Hinterland

Hinterland node	Connectivity (to Liverpool)	Nearest LCR local authority/s	Connectivity
Wigan	67%	St.Helens	42%
Ashton-in-Makerfield	17%	St.Helens	50%
Skelmersdale	67%	Sefton	33%
		Knowsley	25%
Ormskirk	100%	Sefton	58%
		Knowsley	29%
Warrington	100%	Halton	67%
		St.Helens	25%
Chester	100%	Wirral	75%
		Halton	25%
Ellesmere Port	67%	Wirral	75%
		Halton	25%
Buckley	17%	Wirral	13%
Flint	17%	Wirral	13%
Wrexham	17%	Wirral	13%

Longer distance connectivity

Looking further afield, Liverpool's long-distance rail connectivity is somewhat weak, in terms of both direct and indirect linkages. A core message is that for a city with its size of population it is not that well served, and this may well be a stumbling block for both growing the overall economy and supporting the visitor economy in reaching new markets – including ensuring that those visitors are more likely to arrive by sustainable modes.

Long Distance direct connectivity by rail



Modelling of direct connectivity of key UK cities and local authority population

8.4 Safety

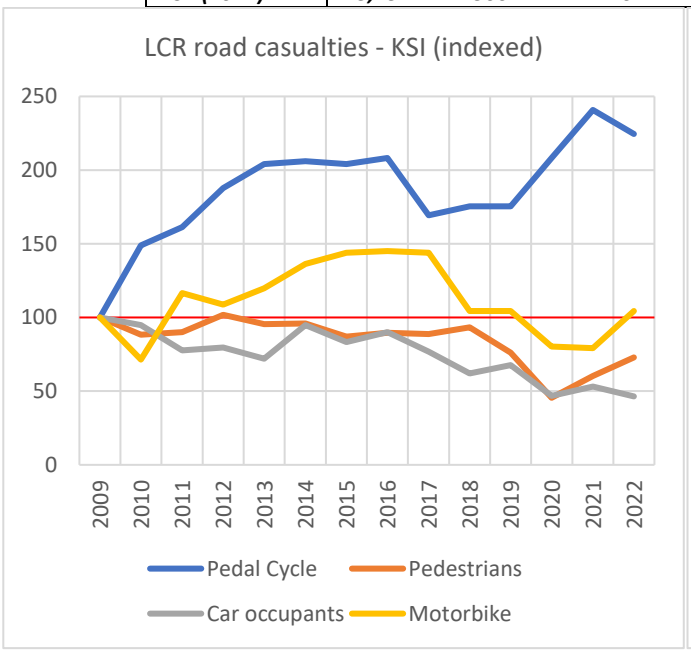
A key area of concern in transport relates not just to satisfaction but also safety, and this is of particular concern to road users. Safety can be a key element to address in trying to encourage greater active travel (whether perceived or actual safety) but is an important factor for all those using the road network.

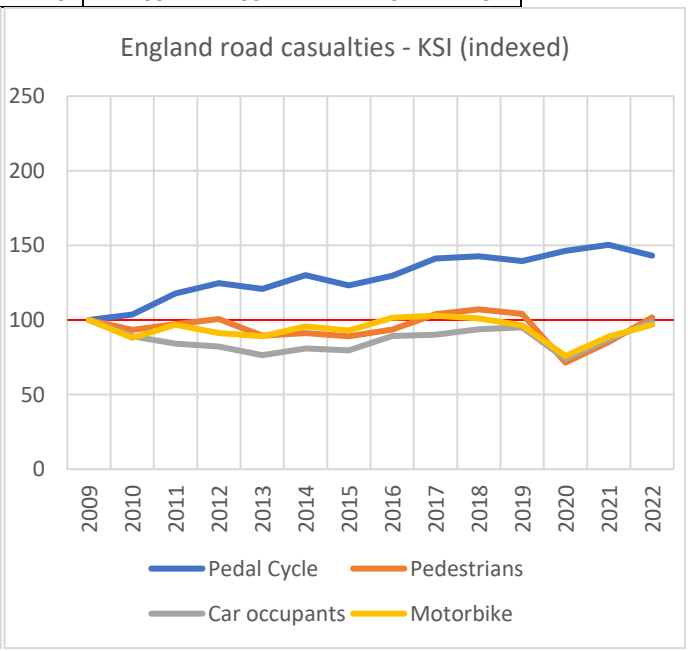
Whilst it is positive to see a continual drop in casualties amongst pedestrians, car and motorbike users (even allowing for drops in travel during COVID), of concern is the increase seen in casualties amongst cyclists, with 110 killed or seriously injured in 2021 compared to 92 in 2011.

This increase in cycling casualties is also observed nationally (although to a lower scale, be aware the lower total numbers in LCR mean this can be exaggerated). There may be a number of factors behind this, including but not limited to: driver skills; cycling skills; road surface conditions; increased numbers of cycle-based deliveries (including fast food). Given the importance of both actual and perceived safety, a research priority should be to understand causes in more detail to see how any issues can be addressed.

Road Safety data

	All Casualties				KSI			
Reported Road Casualties	**Car**	**Motor bike**	**Pedestrian**	**Bicycle**	**Car**	**Motor bike**	**Pedestrian**	**Bicycle**
Halton	101	24	22	29	5	12	4	7
Knowsley	165	22	48	41	17	6	18	10
Liverpool	481	78	315	206	31	26	79	35
Sefton	249	36	90	85	19	17	20	18
St.Helens	170	22	53	32	9	12	11	10
Wirral	259	53	90	102	17	22	30	30
LCR (2021)	**1,425**	**235**	**618**	**495**	**98**	**95**	**162**	**110**
LCR (2011)	***3,134***	***306***	***767***	***413***	***168***	***99***	***226***	***92***



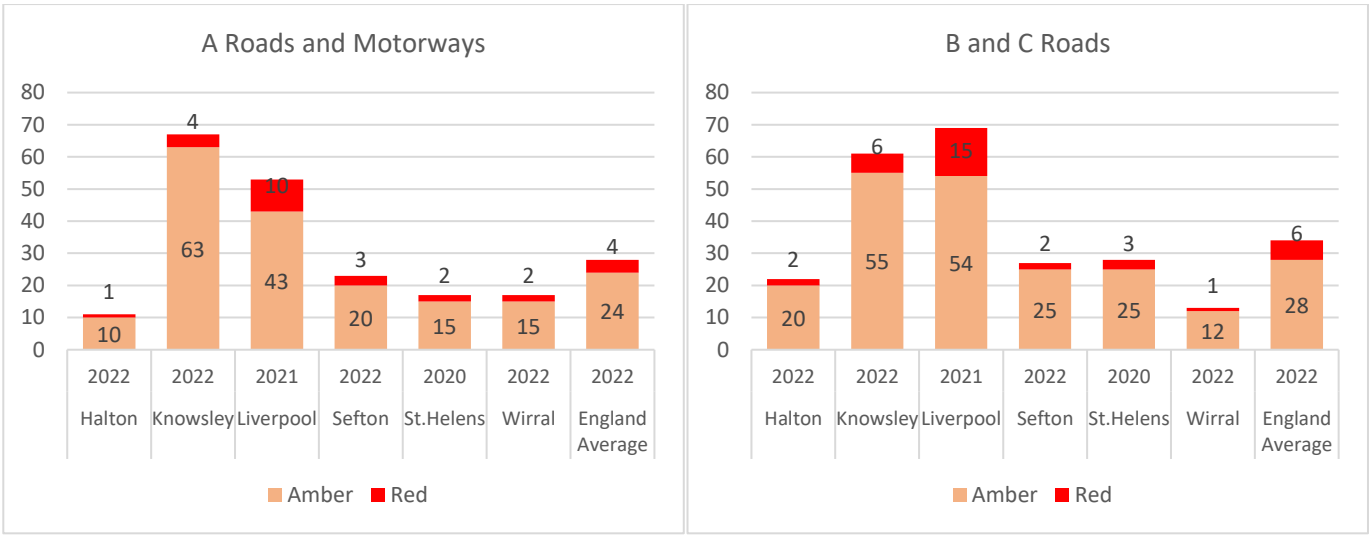


Source: Road Safety Statistics, DfT

Given the possible contribution of road conditions to cycling safety, as well as being a factor in terms of safety for other road users – and general efficiency of the transport network for people and goods – it is also useful to consider what the evidence says here.

Although much of the city region's road conditions appear to be better than the national average, this is not necessarily the case in Knowsley and especially Liverpool (where 10%-15% of roads are in the red category, against 4%-6% nationally).

Condition of Roads in LCR



Source: Road Condition Indicator scores, DfT

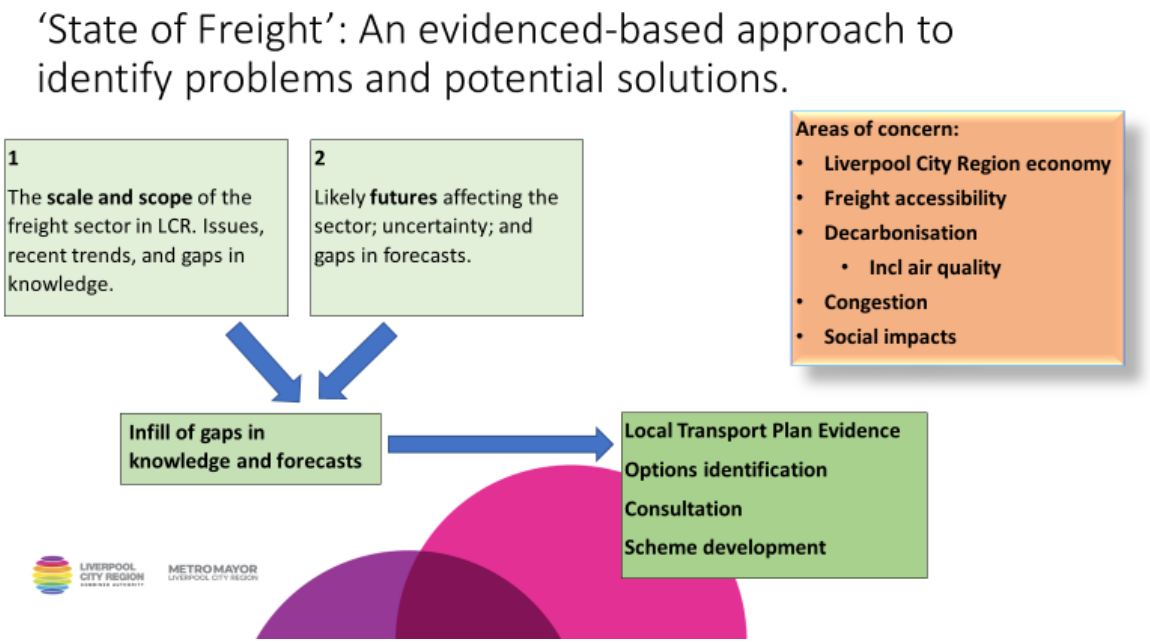
(Showing proportion of local authority roads classed as red or amber, with year of most recently available data: Red = "Investigation required to ascertain if work is immediately required; Amber = "May need work sometime soon")

The customer experience matters in transport, as it determines the modal choices they make – and indeed, whether or not they make the journey at all. This section has identified a number of weaknesses in the Liverpool City Region transport network, which can be seen as explaining much of the travel behaviours identified earlier in this report. There are areas of connectivity which certainly may drive people towards using the car, especially when we consider the fact that the Liverpool City Region is not an island, and journeys to the hinterland and beyond may be interlinked with choices of how to travel within the area. There are some clearly defined areas of lower satisfaction in both bus and rail networks, safety considerations for those cycling to be addressed, and improvements to road conditions for the sake of all transport users.

Section 9. A focus on freight

9.1 The State of Freight

An ongoing piece of work within the Liverpool City Region is "The State of Freight" – this is an evidence-based approach to understanding the challenges and opportunities arising from the logistics sector within the Liverpool City Region, and the development of schemes through LTP4 and LCR pipeline work. This section picks up on the key evidence garnered about this theme, the latest research conducted, and where evidence remains to be filled.



A number of factors coming together from the evidence particularly makes the case for change in terms of the freight sector, including:

- Carbon emissions – Liverpool City Region has committed to reaching net zero by 2040. Yet transport emissions have shown little change over a number of years, and in 2019 accounted for 34.7% of all carbon emissions; with 12.3% of all road transport energy use coming from HGVs and 15.6% from LGVs.
- Air quality - Carbon emissions are not the only concern. Numerous research has identified the negative impact of poor air quality on health, and transport acts as a significant contributor towards this. For example, 34% of the UK's NO2 emissions comes from transport (if including aviation and shipping), as do 13% of all PM2.5 emissions. At a local level there are long-standing concerns about air quality – the whole of Liverpool is an Air Quality Management Area , as are specific parts of Halton, Sefton and St.Helens. Whilst the port of Liverpool itself is likely to act as a key source for such pollution – both from ships and road vehicles accessing the terminals – there are many more sources across the City Region connected with freight. converting road freight from carbon-based fuels to alternative energies is not a complete solution when it comes to air quality, i.e., just 13% of all HGV emissions of PM10 come through the exhaust, with other aspects such as brake / tyre / road wear accounting for the majority of particulates.
- Economy – The logistics sector is a key part of the local economy, directly accounting for 36,000 jobs (equivalent to 5.6%of all LCR employment) and £1.5bn GVA. This is besides

considering the wider economy (back-office functions, suppliers, etc.) that support the industry, and the sector offers potential for further growth. Across the North, logistics has been recognised as one of the three sectors which are key enablers for transformational growth in the Northern Powerhouse Independent Economic Review. Note also that currently the LCR sees relatively competitive travel to work times (an average of 25 minutes compared to an England average of 30 minutes), but there are notable areas of congestion on both rail and road, which can impact on both logistics operations and the wider economy.

- The port – The port of Liverpool is a significant asset for the Liverpool City Region – not least in the potential offered by the asset of a westward-facing port in a post-Brexit environment. Besides the benefit seen to the LCR economy itself, the port offers net national benefits, with the potential for trade to arrive in a port closer to its end destination and avoiding crowded infrastructure in London and the Southeast.

In order to better understand the issues and opportunities arising from freight, State of Freight has adopted a number of initial segments, these being:

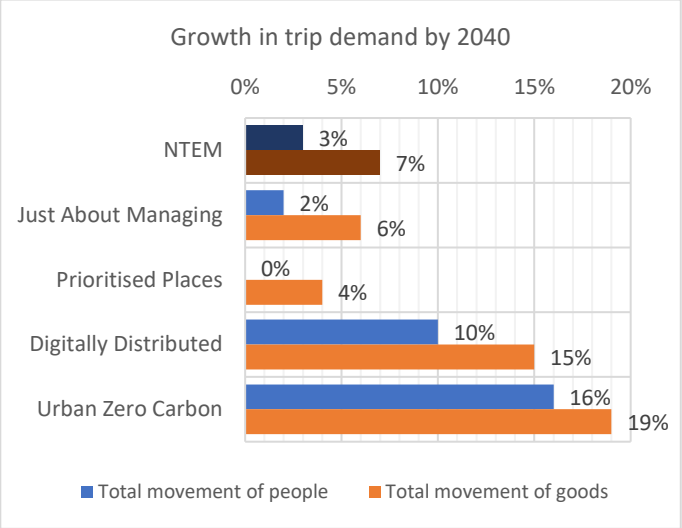
1. Freight through the port.
2. Containerised/trailer freight to/from key City Region hubs (but excl. port traffic).
3. 'Last mile' freight for consumers.
4. 'Last mile' freight for business.
5. All other freight.

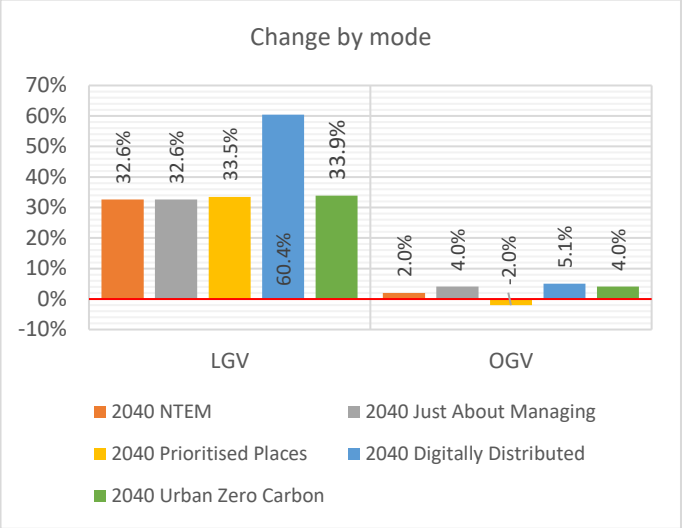
This is not based on data, but on the behavioural characteristics in terms of the way that the segment operates, and the unique problems and opportunities each segment brings. However, in terms of much of the data underpinning the State of Freight, this covers the following categories:

a) Port freight
b) Air freight
c) Road freight
d) Rail freight
e) Freight and the environment

The uncertainty work shown in Section 7 suggests that the issues from freight that this section highlights are only going to increase. Although this is most marked for LGV traffic (increasing by between 33% and 60% by 2040), in most future scenarios HGV traffic will also increase by up to 5% (and more markedly in terms of HGVs to/from the port).

Transport Demand Scenarios: Implications for freight





LCRCA Travel Demand Scenarios

9.2 Port Freight

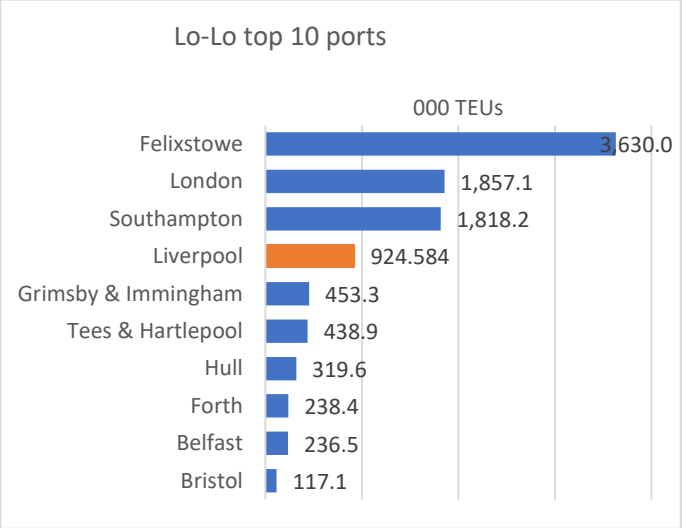
Liverpool is the third largest port in the country in terms of total tonnage, with 33.6m tonnes – or, if excluding liquid bulk, 22.6m tonnes. Liverpool has now overtaken Felixstowe in this respect. In terms of its importance nationally, Liverpool accounted for 7.5% of all cargo through UK ports (or 8.4% if excluding liquid bulk).

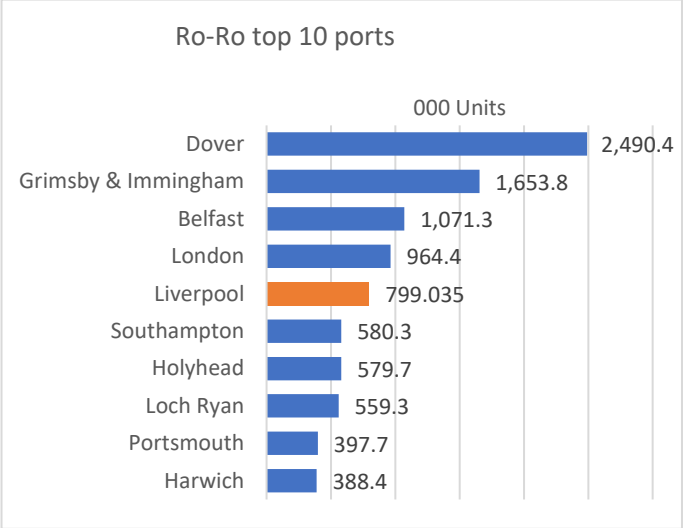
Unlike many UK ports Liverpool is very much a mixed traffic port, serving a wide range of terminals on both sides of the river. These include.

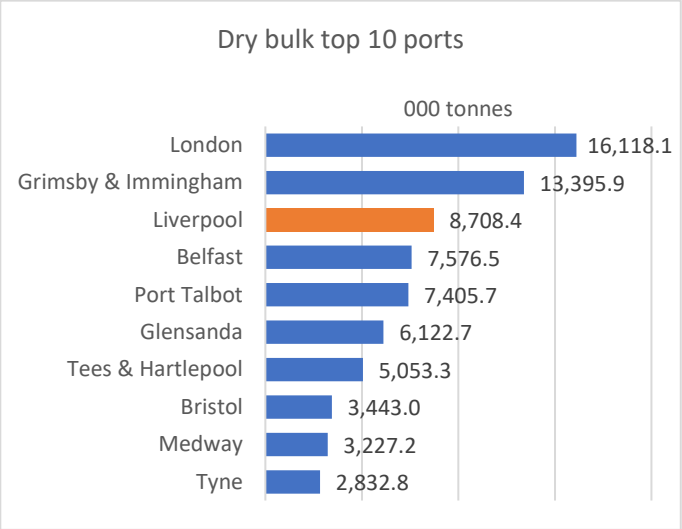
- The new Liverpool 2 container terminal at Seaforth, which is able to handle the largest post-Panamax ships, and which is in addition to existing container facilities.
- Tranmere oil jetty (with onward transport via pipeline).
- On-river ferry terminal at Twelve Quays, Birkenhead, together with in-dock terminals in Brocklebank Dock and Gladstone Dock, mostly serving Irish Sea freight and passengers.
- Bulk cargo handling facilities throughout the dock complex, from Bootle to Seaforth.
- Isle of man passenger ferry terminal and cruise liner terminal at Liverpool Pier Head.

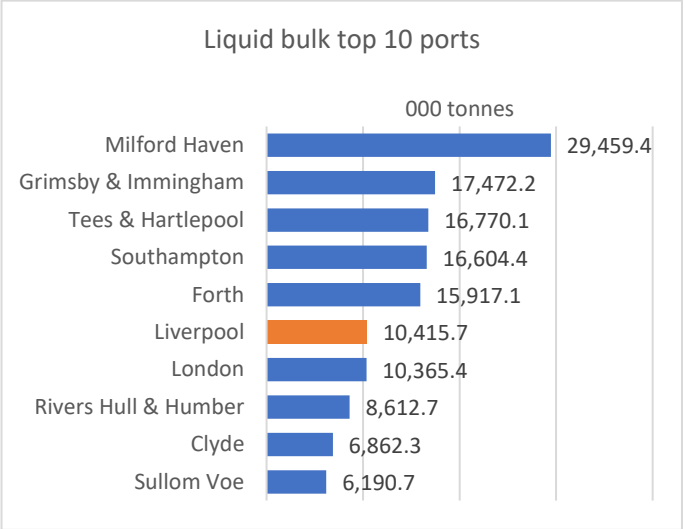
It is also worth bearing in mind that there were also 6.2m tonnes of cargo conveyed to/from destinations along the Manchester Ship Canal and 500,000 tonnes to/from the port of Garston.

Key Port Freight data









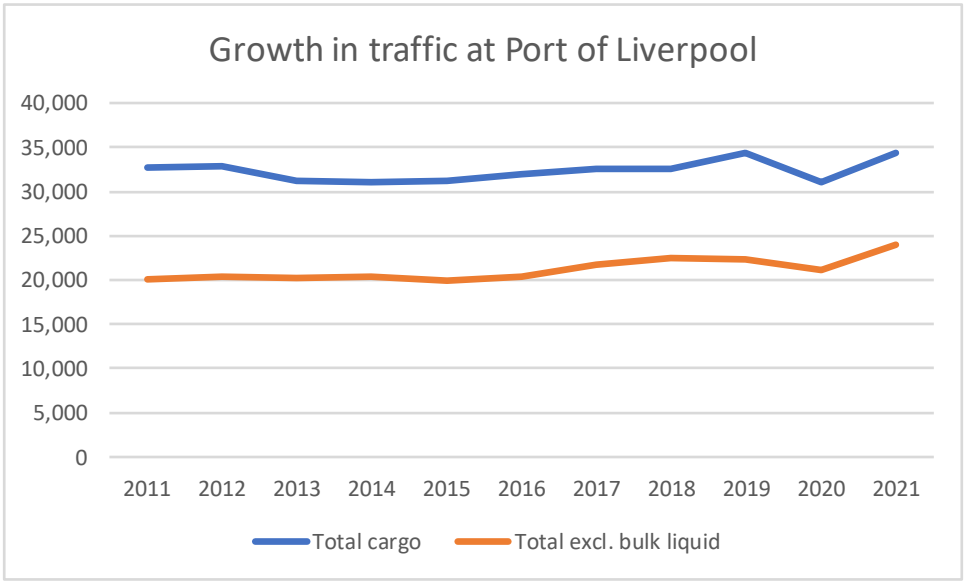
Source: Port Statistics, DfT

	Tonnage (000s)	% of all Port of Liverpool freight	% of all UK port traffic (by tonnage)	Units (000s)	TEUs (000s)
Liquid Bulk	10,415.7	30.2%	6.4%		
Dry Bulk	8,708.4	25.3%	9.0%		
Lo-Lo	6,630.5	19.2%	10.5%	525.7	924.6
Ro-Ro	7,637.5	22.2%	8.0%	799.0	
Other general cargo	1,062.2	3.1%	5.8%		

Source: Port Statistics, DfT

Traffic growth at the Port of Liverpool over the previous year was +10.9% (or +14.0% if excluding liquid bulk freight). Total traffic was +0.4% higher than pre-COVID – but again this was higher (+7.4%) if excluding liquid bulk cargoes from the analysis.

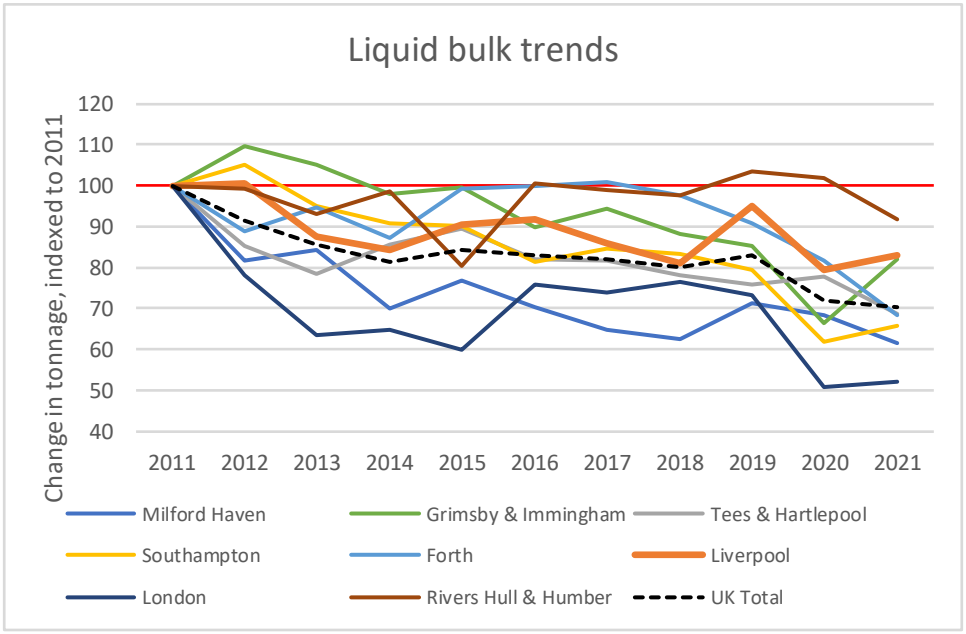
Overall Port Traffic trends



Source: Port Statistics, DfT

This overall pattern hides several distinctiveness's, which are briefly explored in the charts which follow below; note here we compare the pattern of freight growth or decline at the Port of Liverpool with its 'competitor' ports.

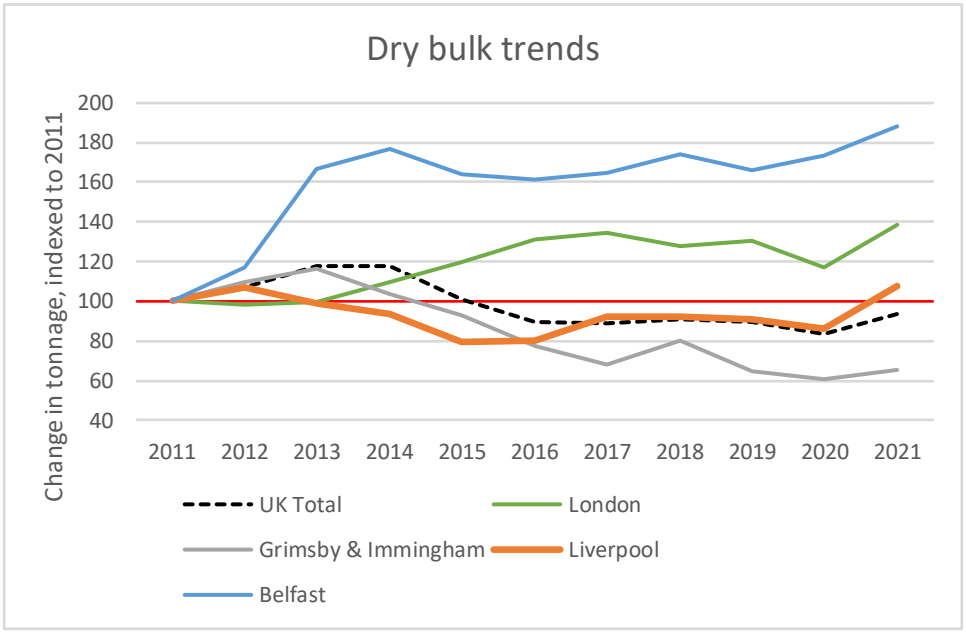
Trends in Liquid Bulk, top UK ports



Source: Port Statistics, DfT

By and large **there is a pattern of decline in liquid bulk freight** – this may be at least partially linked with reducing use of fossil fuels. Across the UK this cargo has dropped by -29.8% in the last ten years, and by -17.0% through the port of Liverpool.

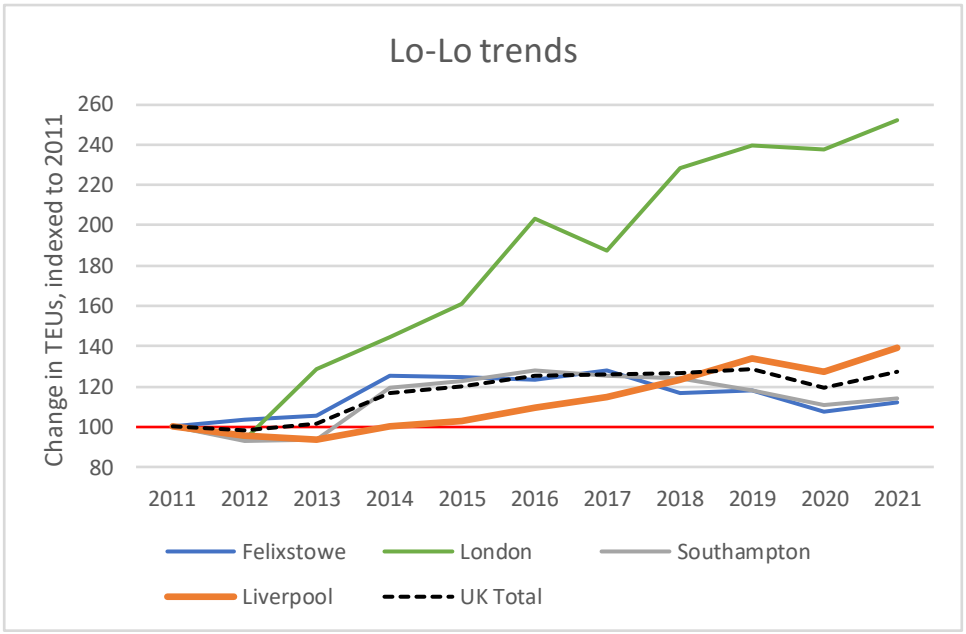
Trends in Dry Bulk, top UK ports



Source: Port Statistics, DfT

Dry bulk is harder to unpick in terms of trends, as this category covers a wide range of goods, including food stuffs. Thus, a certain amount of caution needs to be exercised in viewing the above numbers. Still, it is worth noting that **dry bulk traffic in Liverpool has grown steadily from 2015**.

Trends in container traffic, top UK ports

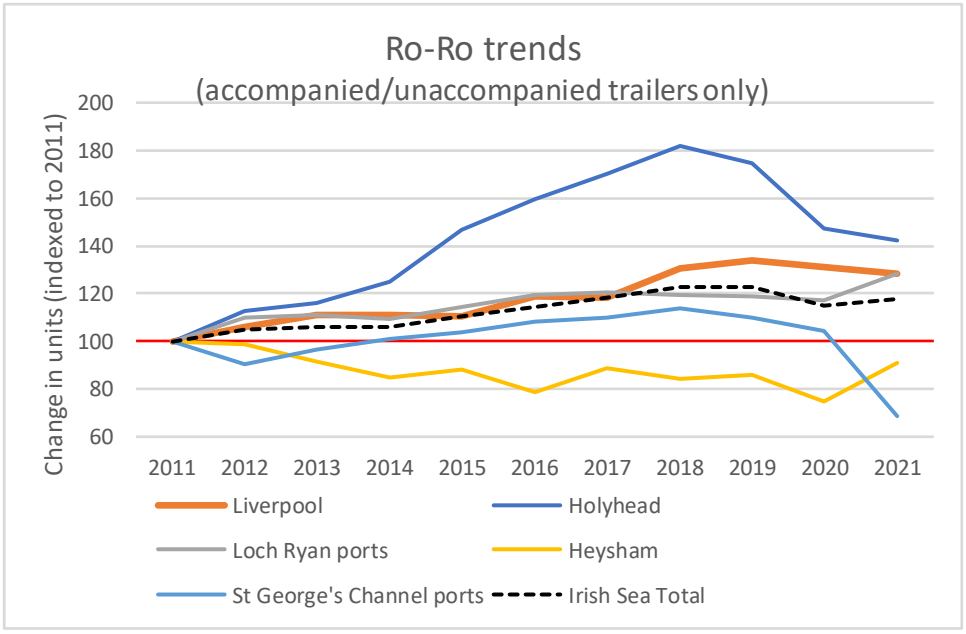


Source: Port Statistics, DfT

Trends for container traffic are dwarfed by the growth seen in London – this largely representing the impact of the new London Gateway terminal which opened in 2013, so may be overstated above. **Container traffic growth through the port of Liverpool has been consistently stronger than many other ports from 2013**, and over the last ten years grew by +48.5% compared to +25.8% for all UK

container traffic**.** Container traffic at the port is at its highest ever level, and much of this growth reflects the opening of the new Liverpool 2 terminal in 2016.

Trends in roll-on roll off freight traffic, top UK ports



Source: Port Statistics, DfT

For Roll on – Roll off traffic, a comparison is made not with the other largest ports, but with the other Irish Sea ports which Liverpool may be 'competing' against in the ferry market.

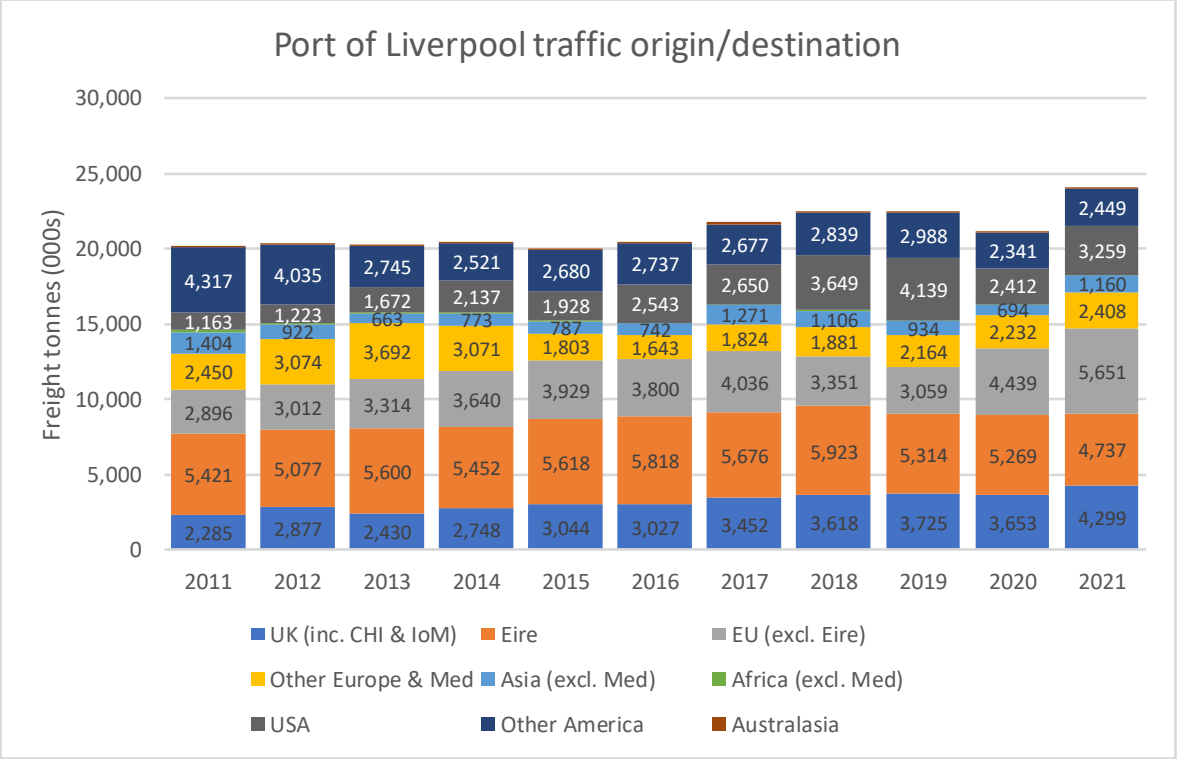
Overall, **Liverpool has seen strong growth over the last ten years (+28.2%, compared a net Irish Sea total of +17.6%)**. There has been a slight decline in volumes of this traffic over the last two years (-4.1% through Liverpool, matching the net Irish Sea change of -4.4%). This may reflect some traffic diverting to the additional direct Ireland-EU routes that have been set up post-Brexit.

This should not detract from Liverpool's strength in this market (having also seen success in the passenger market, which may only increase in the wake of *flygskam).* It can also be seen that the main area of recent freight growth (i.e., post-Brexit) has been in the Loch Ryan ports, which for many markets imply significant additional road freight mileage.

A key point is that **the Port of Liverpool serves a range of geographic markets**:

- 37.6% of all freight tonnes came from Eire or UK Domestic (although this latter will include a number of ports, including the Isle of Man, a component here will be Northern Ireland).
- 23.5% of all freight tonnes came from other parts of the EU.
- 23.7% of all freight tonnes came from America, including 13.6% from the USA.

Trends in origins and destinations of freight through the Port of Liverpool



Source: Port Statistics, DfT

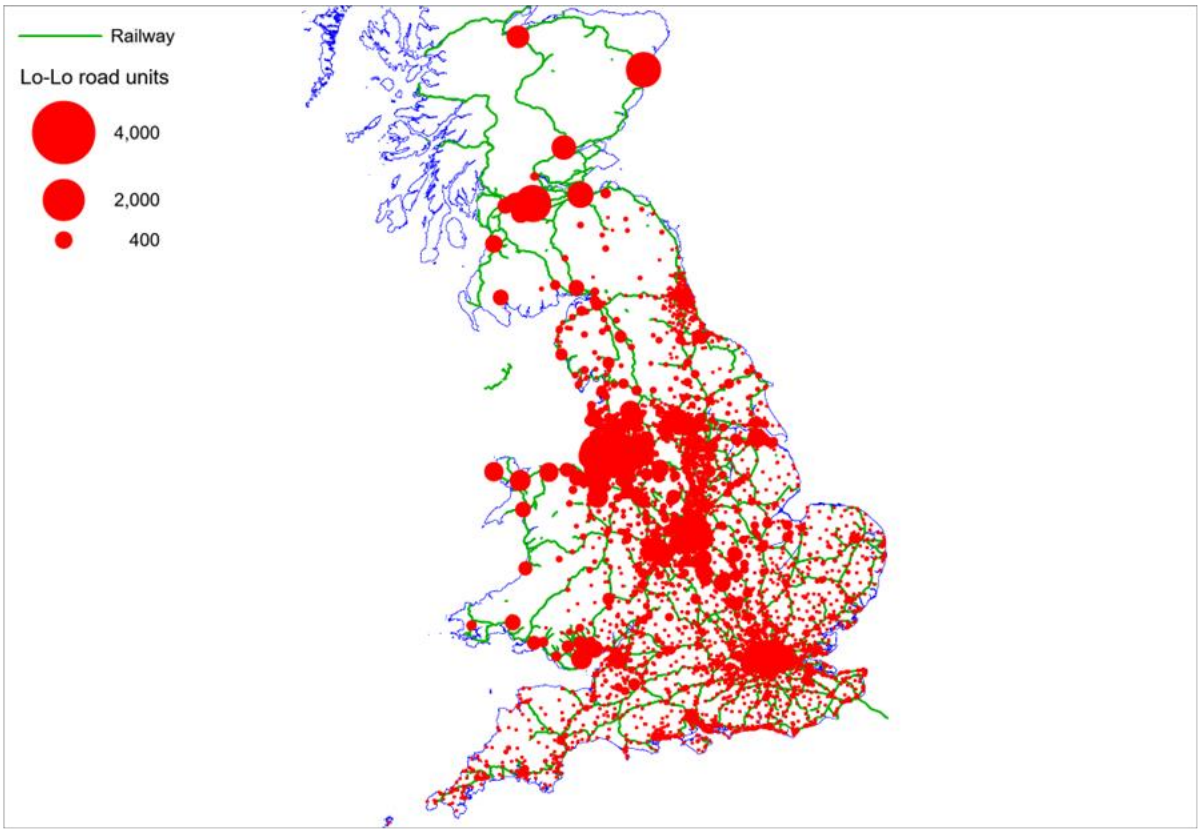
The impact of COVID and Brexit again both need to be considered here; 2020 saw a drop in traffic, most notably in volumes from the Americas and Asia, before growth returned in 2021.

Note how traffic from the EU has shown continued growth over the last two years. This may represent trade in goods with the EU, though given potential Brexit impacts this may be representative of goods being transhipped from further afield at EU ports. Freight to/from other UK ports has grown, especially from 2018 – this may owe something to trade to and from the island of Ireland switching from ports in the republic. Freight tonnes to/from Asia currently comprises just 4.8% of the port's throughput but is showing signs of longer-term growth; containers having grown by +14.8% over the last ten years.

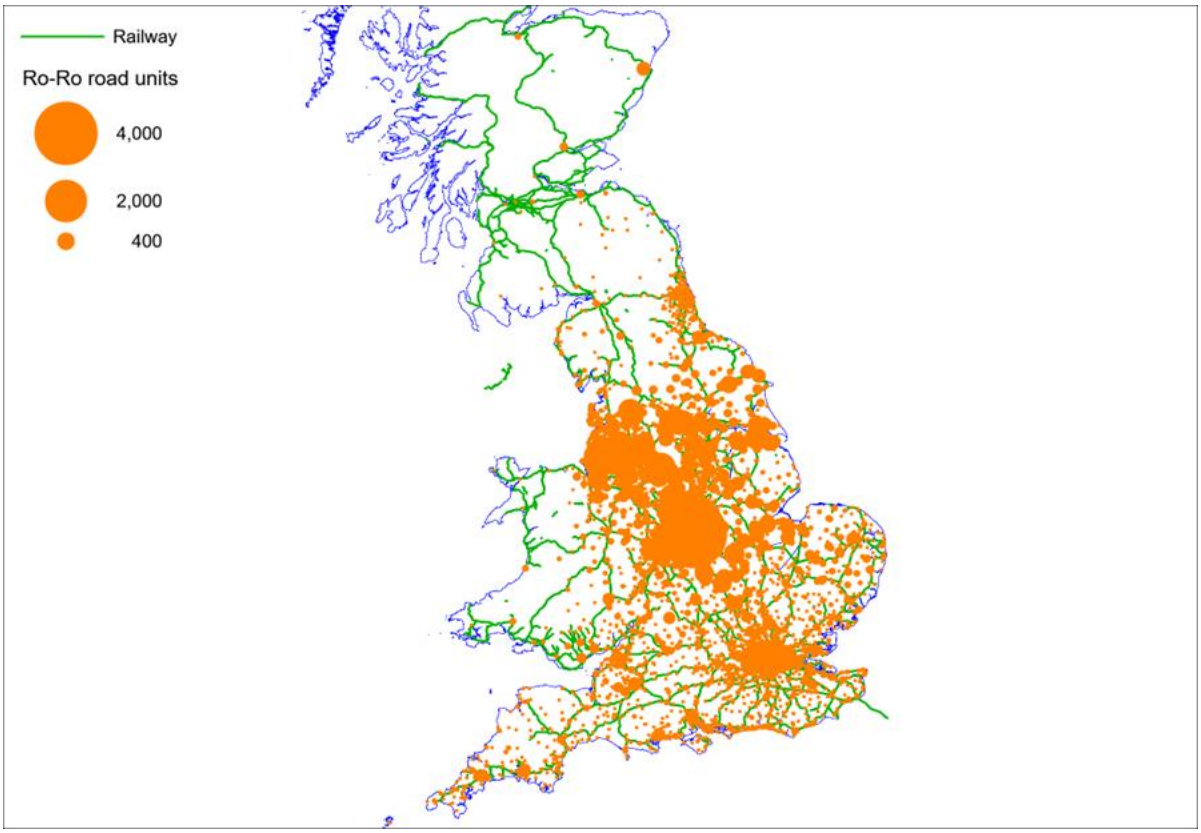
The above reflects data that has been available in previous years; a weak gap in knowledge has always been where the goods arriving/departing through the port are coming from/to on the landward side. With the bulk of goods leaving the port by road, in order to understand potential for optimal solutions, understanding their origins / destinations is key. Work by Motts/MDST has provided the LCR CA with a dataset detailing this across all traffic types through the port.

Initial analysis suggests distinct concentrations of both ro-ro and lo-lo towards the Midlands, London & the Southeast, across the Pennines, towards Bristol and South Wales and – in the case of lo-lo – Scottish markets too. There are also heavy local concentrations too, both in terms of the City Region and wider North West / North Wales, something that is particularly marked when we come to bulk traffic.

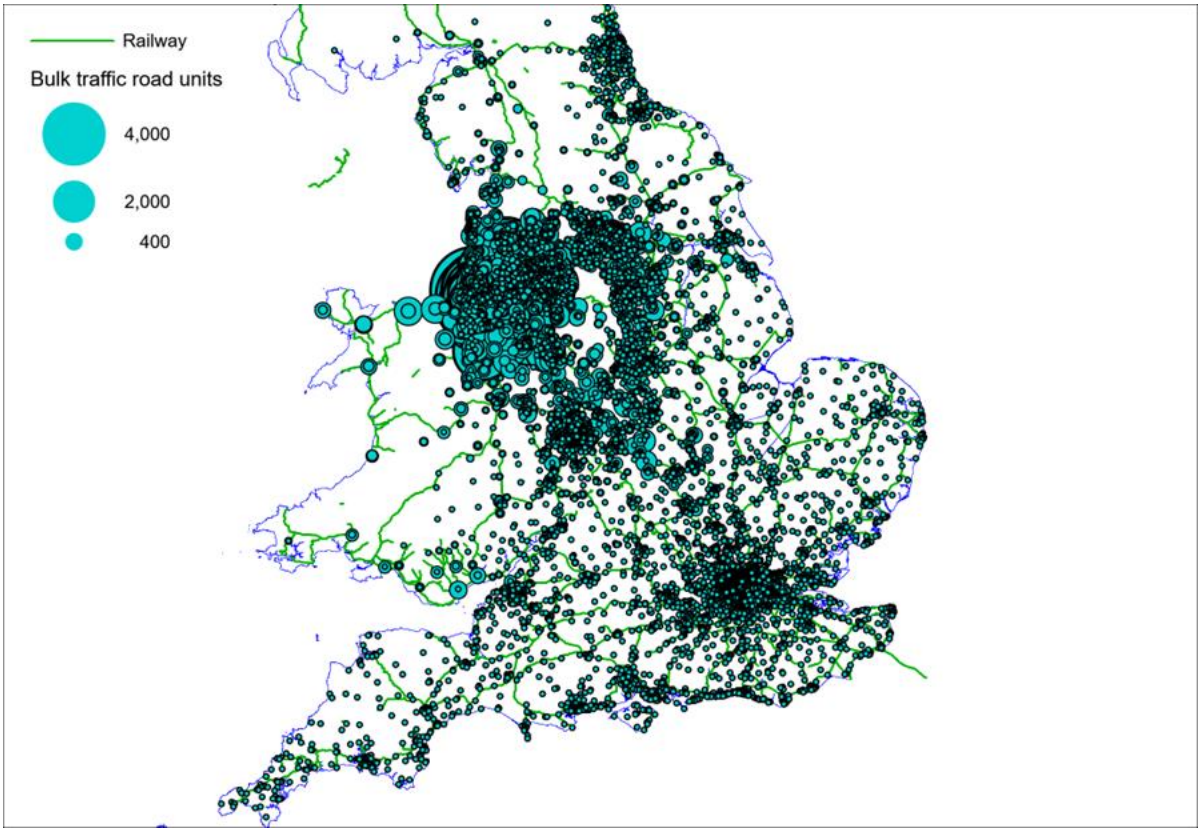
Port freight: origins / destinations of road movements



Origins/Destinations of container traffic to/from the Port of Liverpool
Source: Motts / MDST study for LCRCA, all numbers expressed as road units per annum



Origins/Destinations of roll-on roll-off freight to/from the Port of Liverpool
Source: Motts / MDST study for LCRCA, all numbers expressed as road units per annum



Origins/Destinations of Bulk traffic to/from the Port of Liverpool
Source: Motts / MDST study for LCRCA, all numbers expressed as road units per annum

The work by Motts/MDST also noted the level of traffic from the port on the wider road network, so at given sample points:

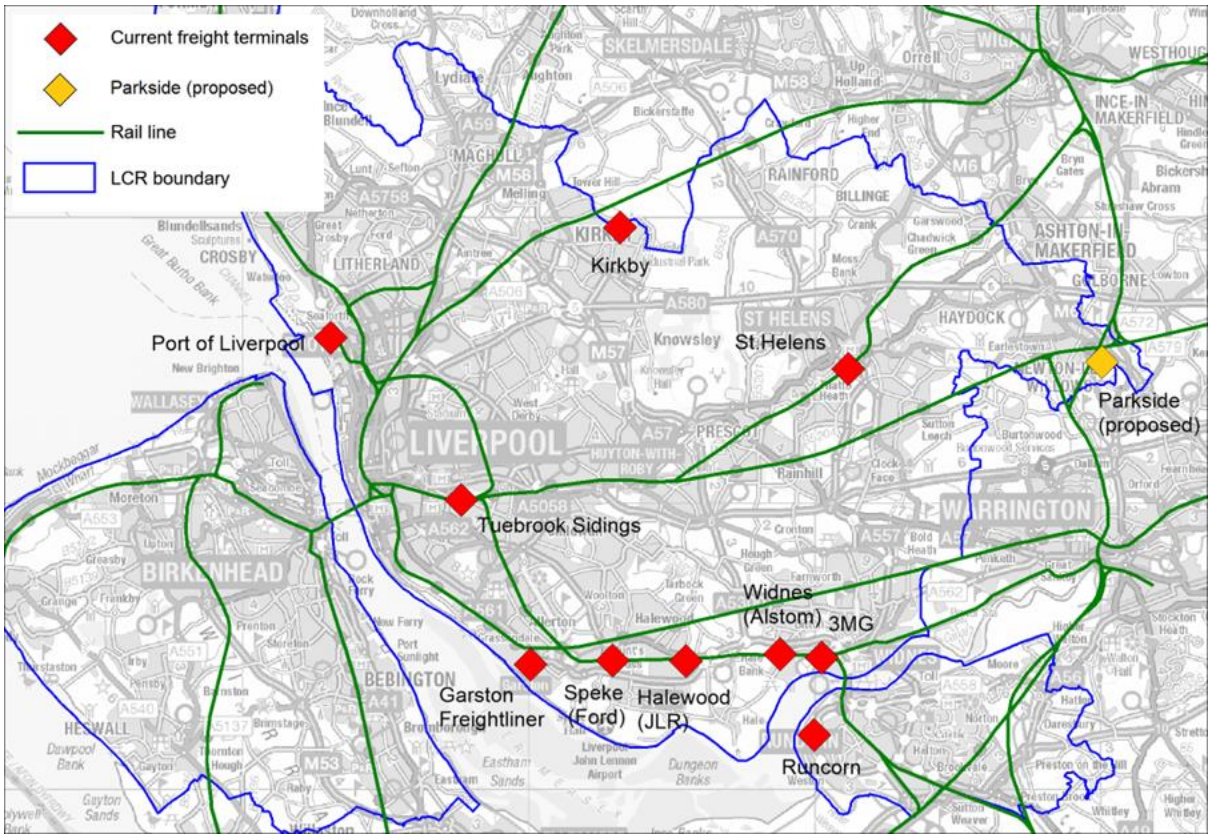
- 6% of HGVs on the M6 Southwards are HGV port traffic
- 2% of HGVs on the M6 Northwards are HGV port traffic
- 2% of HGVs on the M62 Eastwards are HGV port traffic

9.3 Containerised/trailer freight to/from the City Region

Not all containerised or HGV freight to/from the City Region is connected with the port. There are (for example) goods bound to/from LCR which have entered the UK through other ports; raw materials for manufacturers and finished products being despatched; and internal flows (including those linked to retail) between key UK distribution centres.

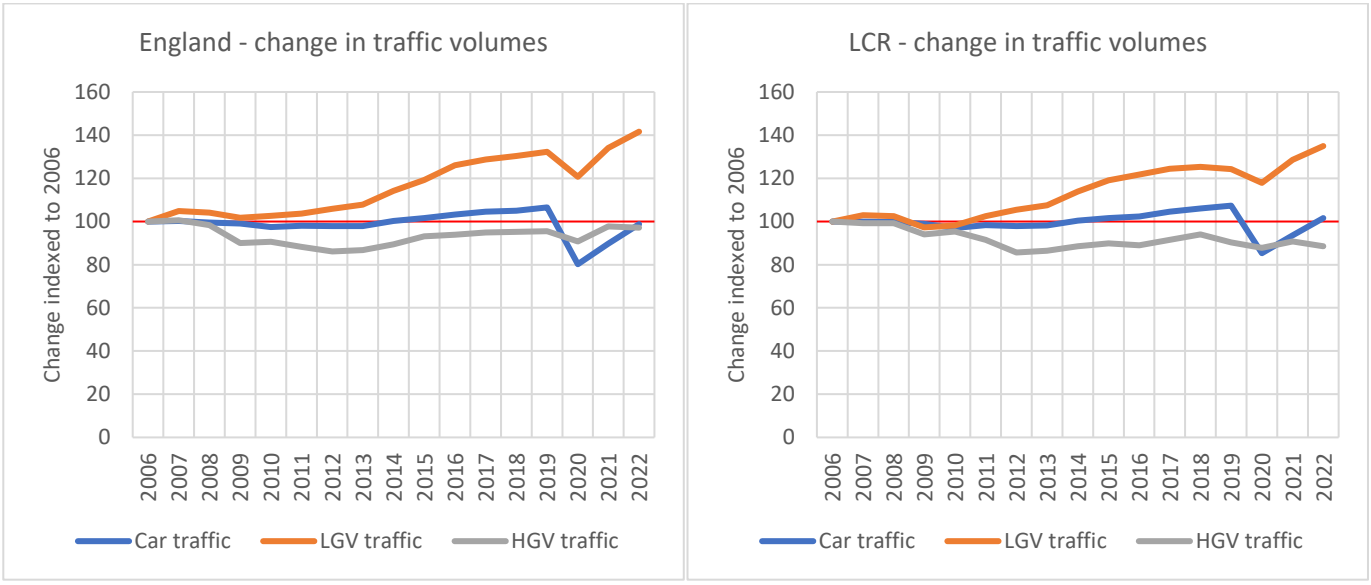
Although much of this traffic is assumed to be road-based, there are a number of rail freight terminals across the city region (map below, and see the appendix for fuller details), with a number of manufacturers including JLR making use of these. Note that many of the current LCR rail freight facilities are reliant on the congested Liverpool-Crewe section of West Coast Main Line.

Current operational or proposed LCR rail freight terminals



National and local data suggests that HGV traffic mirrors economic performance. This was back to pre-recession levels nationally, although COVID-19 has clearly had an impact on the economy and associated recovery, with volumes almost constant in LCR from 2010. The growth in LGV traffic – referenced later – is also clearly evident.

Long-run trends in road traffic, including freight



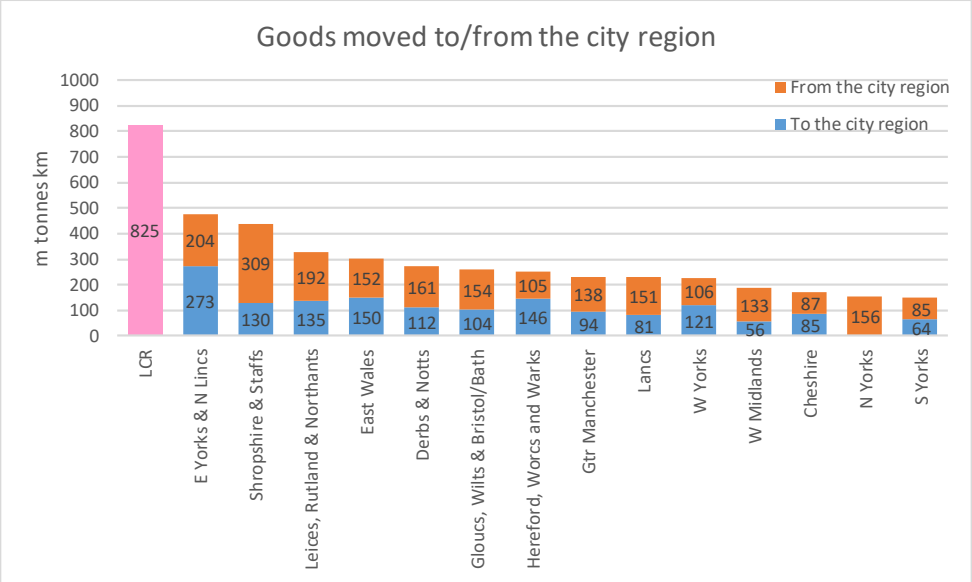
Source: DfT road traffic statistics

Our recent research into port freight data has already shown the geographic reach of HGV traffic. At a higher level, it is important to be aware of movements in terms of origins / destinations of non-

port freight to /from the city region. Currently the best data is that available through DFT to NUTS2 level; a key part of the State of Freight work will be to seek more granular detail on this.

The data available shows how a significant amount of the road freight being moved occurs within the City Region (though note, this may include traffic being moved by LGVs), with almost as much going to/from other parts of Northwest England. Beyond this, the key locations include traffic to/from the Midlands and traffic to/from the other side of the Pennines. (As indicated earlier, this data would include all road freight, including that related to the port.)

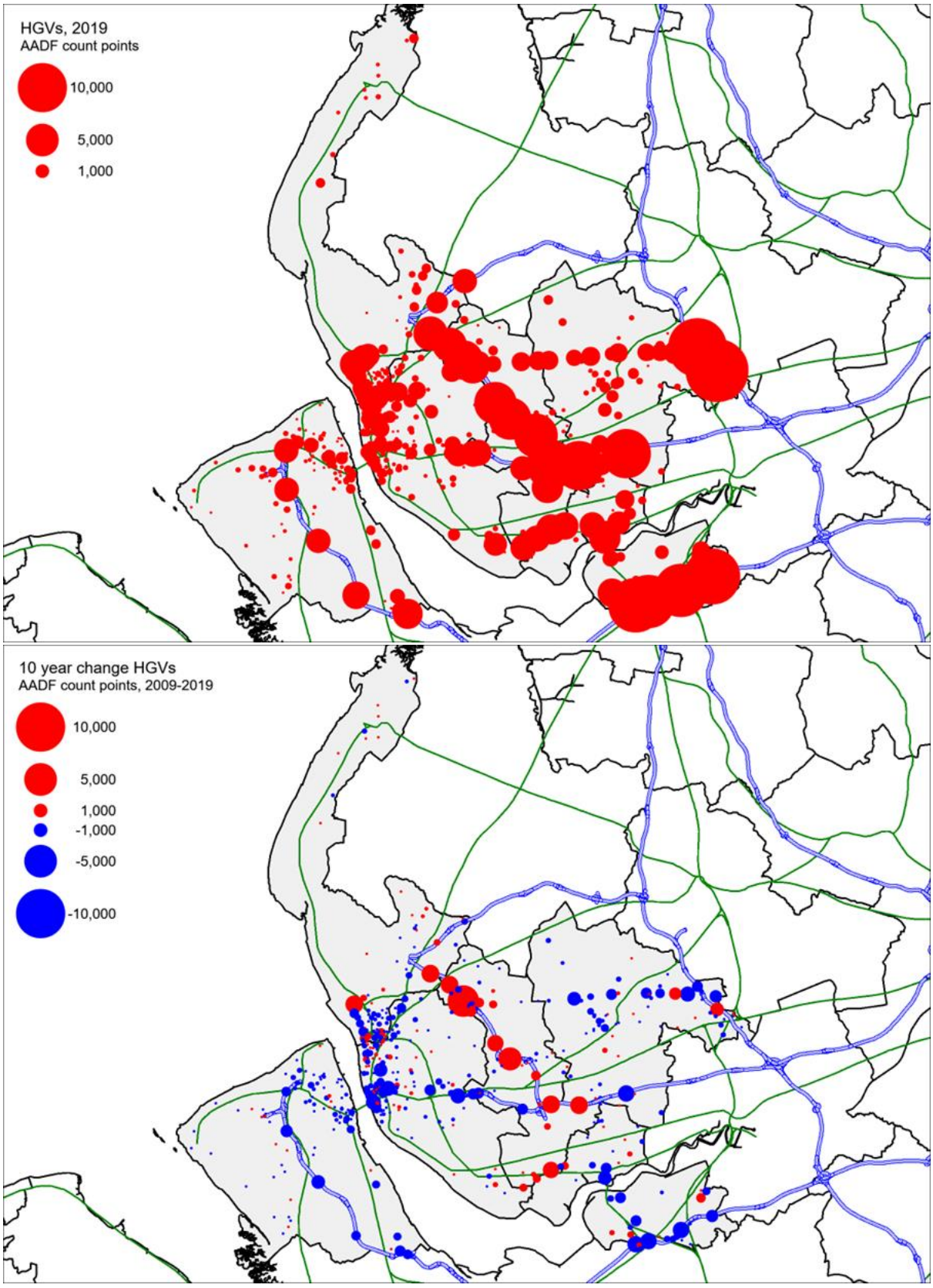
Overview of goods movements by region



Source: RFS0124, DfT

Traffic pollution is not solely linked to HGV traffic, as seen in earlier sections, but HGVs do form a significant component of freight in the city region (overleaf). Clusters of HGV traffic are evident along Motorway corridors, and there are also visibly high levels serving key distribution centres and the port, as evidenced in the map below. The A5036, Queens Drive, East Lancs Road and North-South flows to/from the docks are also clearly visible (though bear in mind data is limited to those locations with counts points). The ten-year change is suggestive of increased traffic to/from the port and other sources using the M57.

Volumes of HGVs at AADF count points



Source: AADF count data of HGVs, 2019; and ten-year change to the same scale

There is always a 'risk' that some traffic which currently uses HGVs might in the future be further disaggregated to LGVs. Whilst there may be some cases where this is a useful role, an increase in LGVs brings its own risks which are explored within later sections.

When it comes to HGV movements, it is also important to consider lorry parking hubs (such as truck stops); and to note that the Liverpool Freeport initiative may impact on levels and patterns of future demand.

The original proposed HS2 and NPR investments offer a chance to release capacity on the conventional network for additional rail freight. This raises the possibility of considering terminals and operation: for example, the role of the proposed Parkside multimodal freight terminal. However, recent announcements in the Integrated Rail Plan may pose a risk.

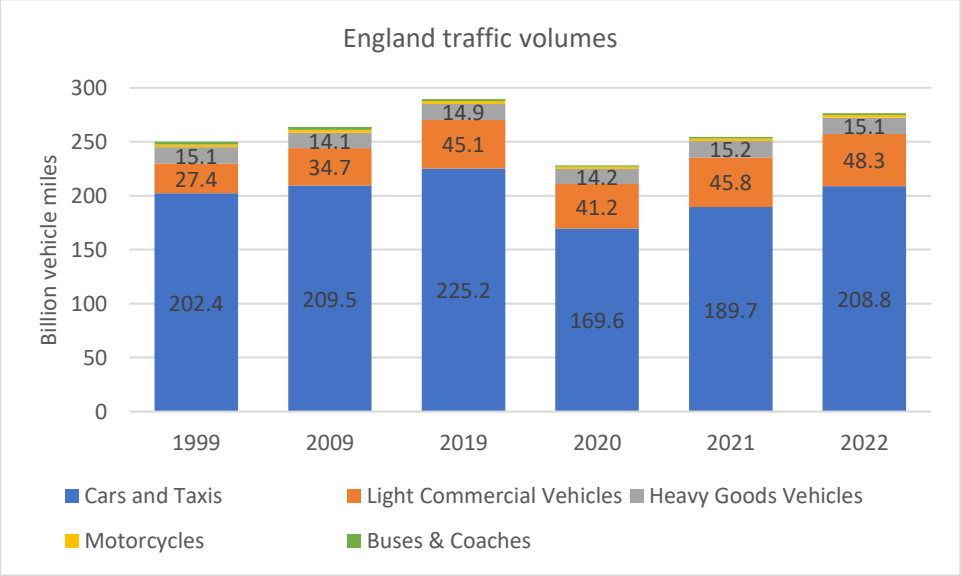
9.4 'Last mile' freight for consumers

This segment of freight analysis principally covers delivery of small(er) goods for consumers, typically to home addresses, often using postal and courier services. The segment tends to be demarked by a few key operators, such as UPS, Evri, DHL, DPD and Royal Mail; and is often (though not always) centred on use of Light Goods Vehicles for deliveries.

There has been a dramatic increase in the traffic volumes being covered by LGVs – up by 36% over the last ten years and by 73% in the last twenty years.

Latest data shows LGV use above 2019 levels.

Volumes of road traffic by vehicle type



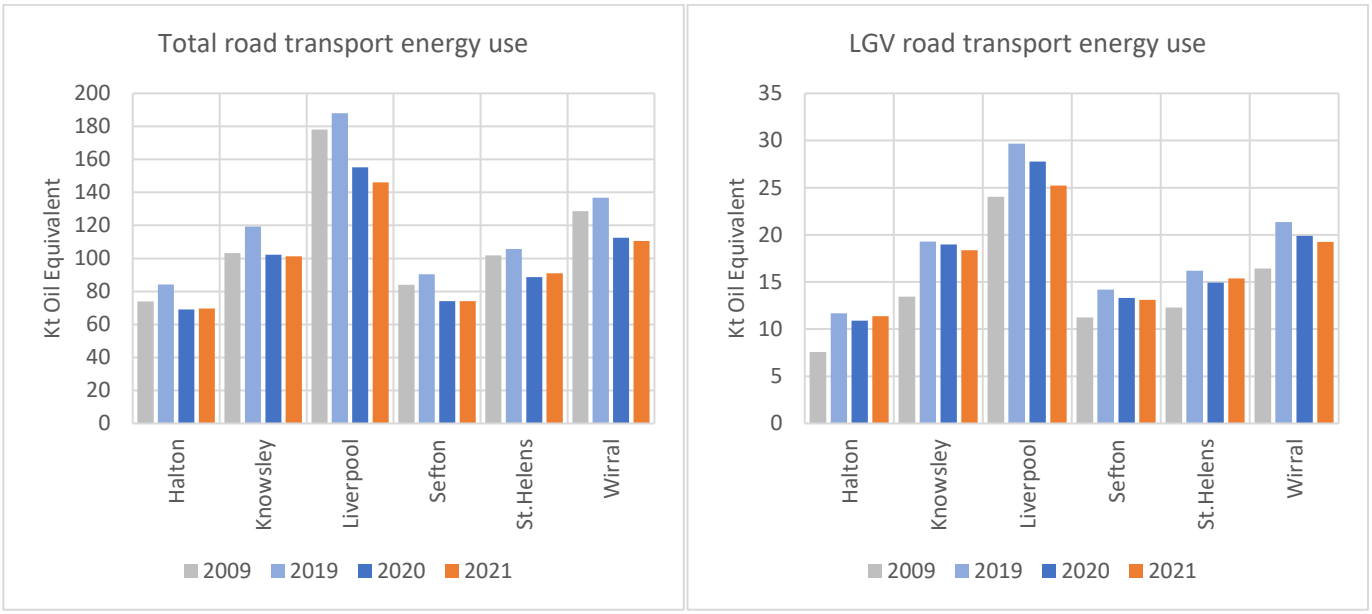
Source: Road Traffic Statistics, DfT

Given that road transport is a major source of greenhouse gas emissions and pollutants, it would be expected that this growth in HGVs would have negative impacts, and data on road traffic energy consumption suggests this may increasingly be the case – especially for Halton and Knowsley. It is – as might be expected that whilst road traffic energy use in total dropped down during 2020, this was less the case for LGV traffic. Qualitative data suggests that much of the growth in LGV use is connected to online retail, which the above data may support. However, note that LGVs are not

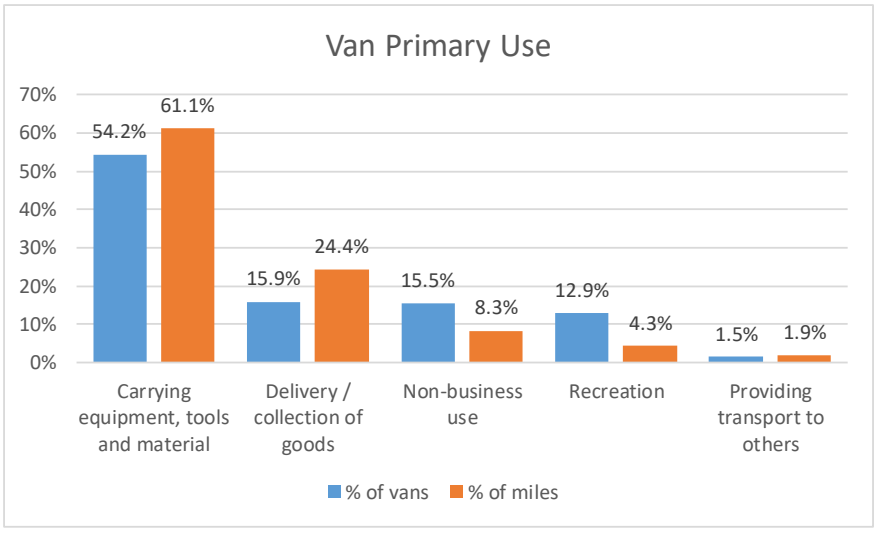
exclusively used for logistics to consumers and cover a multitude of other purposes, such as local builders, last mile for businesses and even personal transport. Indeed, recently published data suggests that the majority of van use was for carrying equipment (i.e., such as use by builders). However, note that although goods deliveries accounted for 16% of van use, this translated into almost a quarter (24%) of van mileage.

There are emerging low carbon options for LGV replacement; and indeed, the latest DfT van statistics[16] reports that 0.3% of LGVs used in goods delivery were Ultra Low Emission Vehicles (ULEV). However, as mentioned previously earlier, this does not recognise that air quality is about more than just exhaust emissions (for example, of all PM10 emissions from LGVs, just 13% are through the exhaust), nor does it deal with road congestion issues related to increased LGV use.

Road transport energy use; focussing on LGVs and LGV purpose



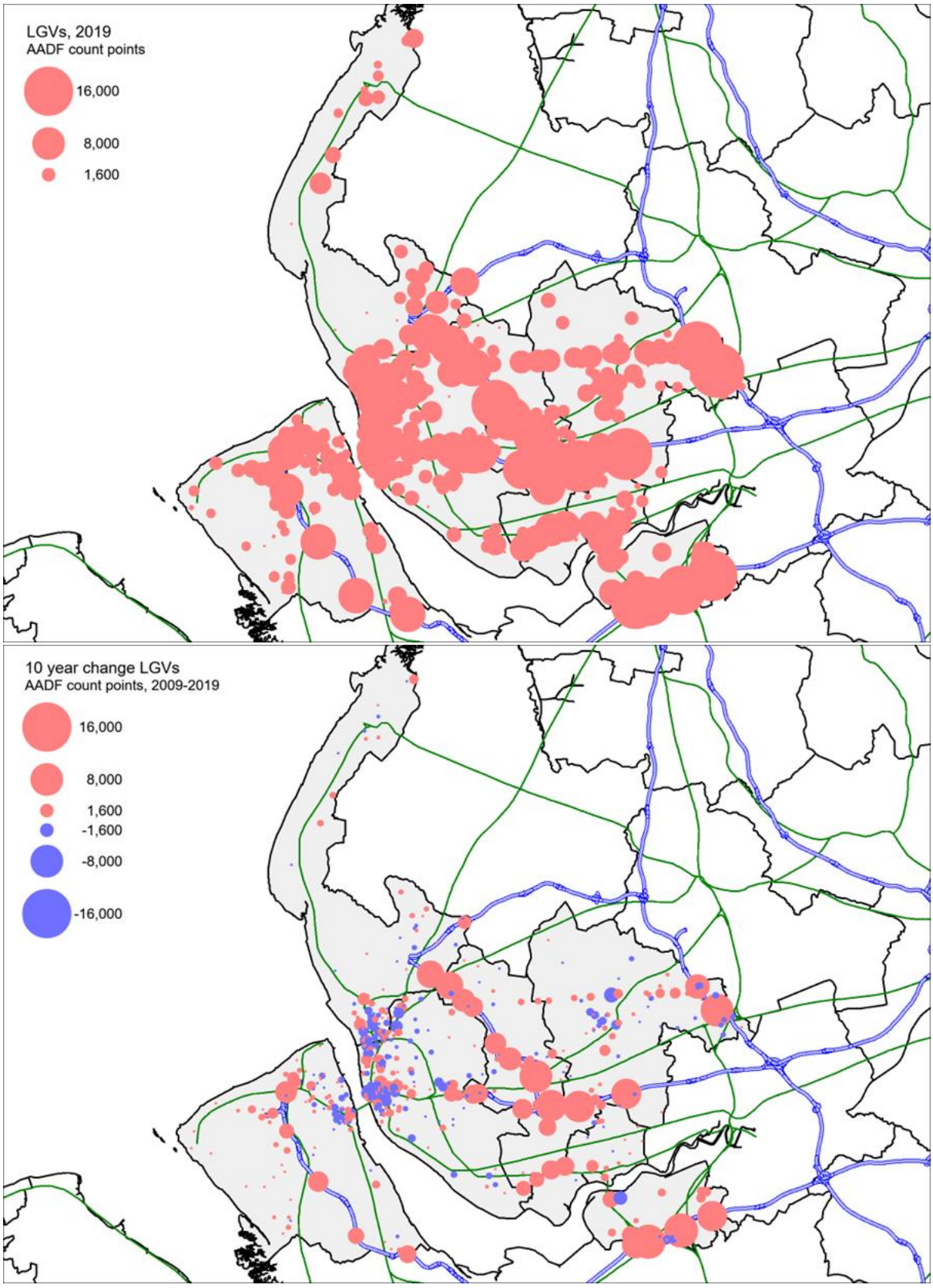
Source: Road transport Energy Use, BEIS



VAN0211, DfT

[16] Van Statistics 2019-20, DfT

Volumes of LGVs at AADF count points



Source: AADF Count data of LGVS, 2019; and ten-year change to the same scale

AADF data helps us to understand particular concentrations of LGV use but (bearing in mind the above points) does not help us to understand a wider picture of their role in logistics sector –

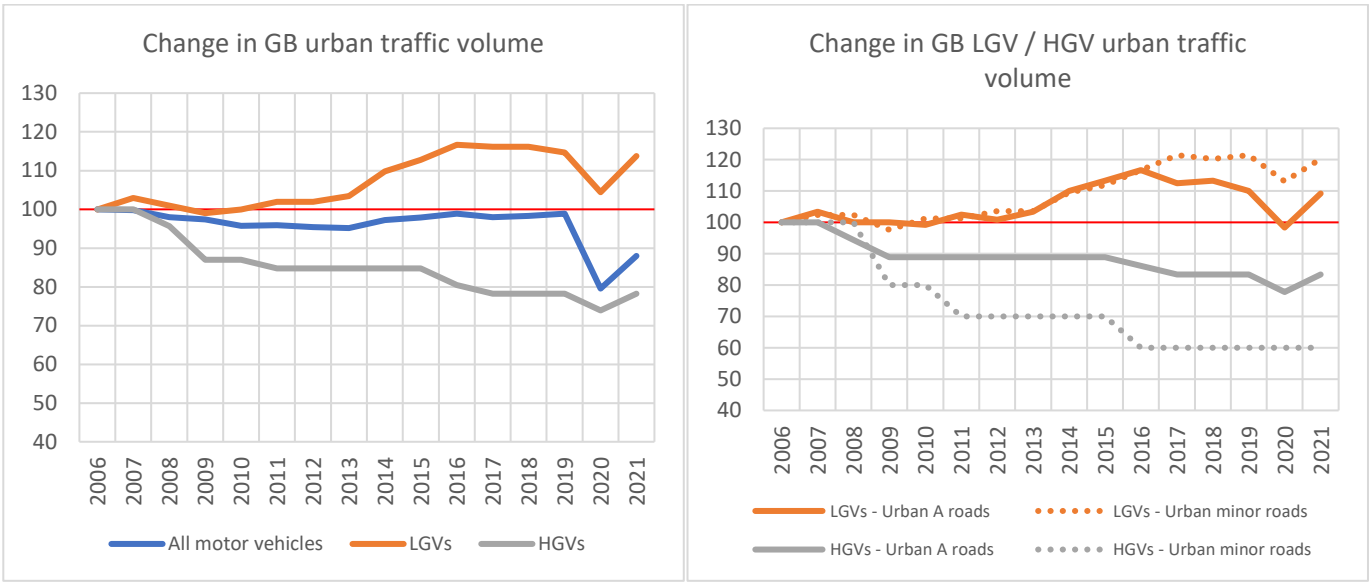
including the levels of efficiency of consumer delivery networks – and where there may thus be scope for improvements through transport schemes and policies. Accordingly, work is ongoing to identify further data sources of use to the Liverpool City Region.

9.5 'Last mile' freight for business.

This segment is aimed at covering the area of freight regarding goods supply for businesses. This is not aimed at heavy manufacturing but is primarily considering distribution networks for businesses in urban areas, including office supplies, retail, and hotels and restaurants. The segment is characterised by the primary use of both HGVs and LGVs, and in some locations may already have restricted delivery hours. Note that the data here may well present an overlap with the previous segment, although strategically it is different.

Data suggests that in urban areas, most traffic issues over recent years are likely to have come from the growth in LGVs, although note that this will cover 'last mile for consumers' as well as other uses of these vehicles, especially on minor roads. Overall, the use of HGVs in urban areas has been declining – this may of course also reflect on changes in business location as much as on any change in logistics trends. Although this data is national, it is assumed that many of these patterns would be applicable to the Liverpool City Region.

Long-run trends in national road traffic volumes, focussing on LGV/HGV by road type



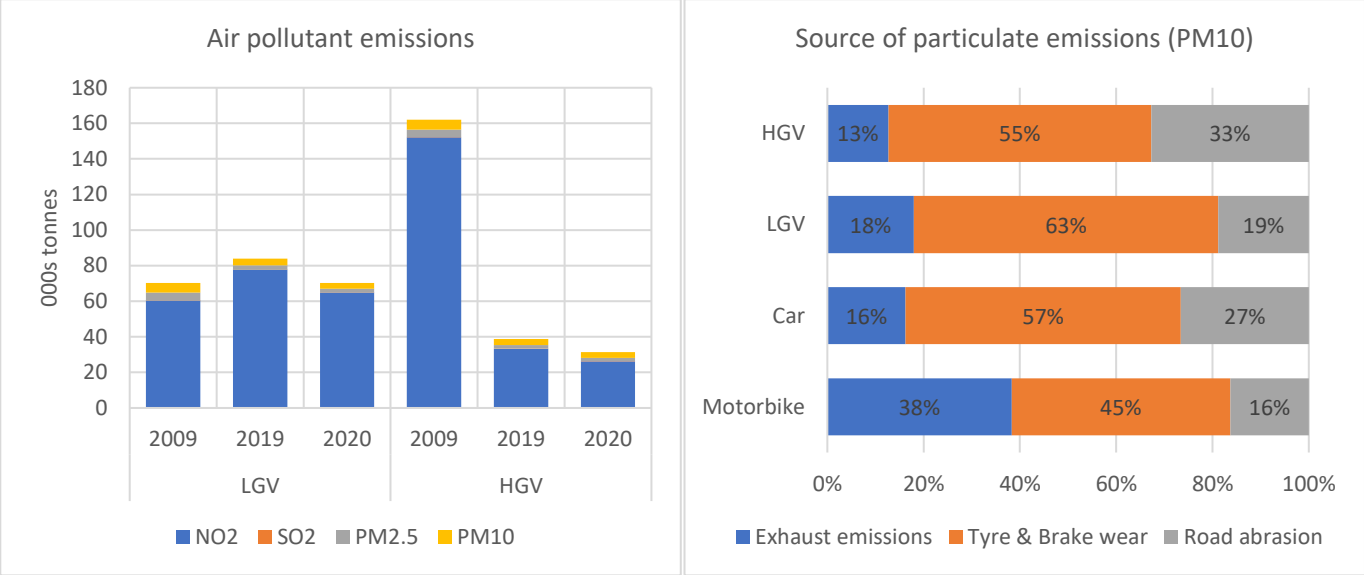
Source: DfT Road Traffic Statistics

As the data earlier noted, there has been an increase in the level of LGV energy use (often a useful proxy for Greenhouse Gas emissions) showing a rise across all Liverpool districts. However, at a national level HGV pollutants have been declining and LGV emissions have been increasing. Notice also that dealing with these emissions is not just about removing carbon-based propulsion, with a majority of pollutants coming from sources besides the tailpipe. Arguably when considering urban centres (such as Liverpool), brake wear may be even more of an issue, given the stop-start nature of such traffic.

A particular distinctiveness of this segment of the freight market lies in its need to serve the urban core, and that the market may already face some constraints on operation (for example: permitted

hours of operation, pedestrian-only access, loading restrictions, and coping with congestion during rush hours).

Levels of air pollutants from HGVs / LGVs



Source: Air pollution emissions by transport mode, DfT

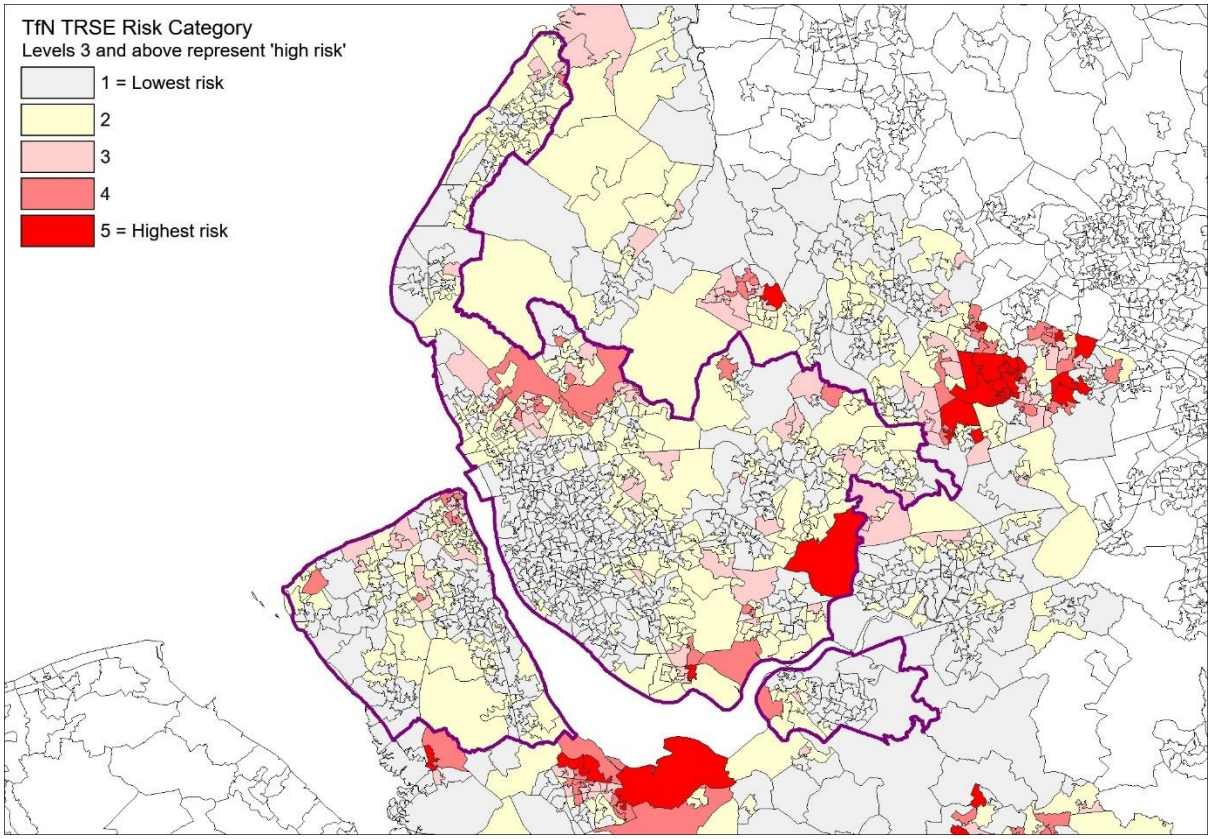
Freight and logistics is a key issue for the Liverpool City Region, both in terms of what it can do to enable economic growth, but also in terms of the challenges of improved sustainability. HGVs are the most visible element of the sector, and fresh data for port-related freight suggests strong potential for modal shift – though this relies partly on interventions beyond the city region boundaries. LGVs represent both more recent and future growth and should be a core element of concern. However, not all LGVs are connected with logistics; this overall is a sector where more information is required.

Section 10. Dealing with Transport-Related Social Exclusion

Transport Related Social Exclusion (TRSE) is defined as being unable to access opportunities due to barriers to transport. Access to opportunity could mean employment and skills, but TRSE also relates to a lack of access to goods and services, and to community life.

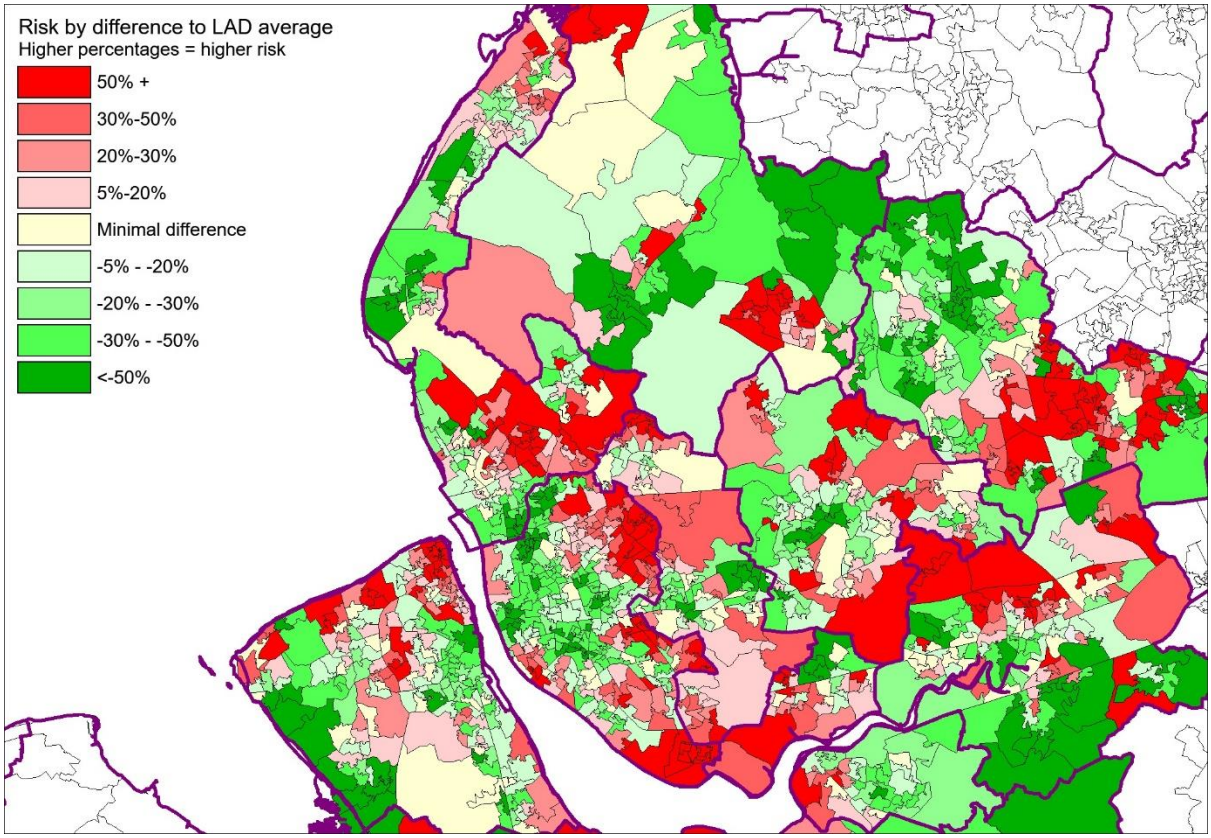
Transport for the North has conducted research into this topic and estimates that there are 3.3m people living in areas of the North of England where there is a high risk of TRSE[17]. Although there has long been a perception of TRSE being associated with rural areas, there are also many urban areas which can experience it, including on the urban fringe. This includes a number of areas in the Liverpool City Region, as mapped below from the TfN data. Note within this categorisation that any area coded as 3 or above is classed as being at 'high risk' of TRSE. 8.7% of the LCR population – over 130,000 people – live in areas at high risk of TRSE.

Although the areas at risk in LCR are widespread, it is worth noting that the opening of Headbolt Lane station may reduce the categories of risk around Kirkby. It is also worth noting that there are also areas at high risk of TRSE within the city region's hinterland, which may be of relevance to LCR transport policy. Areas of particular note in this regard includes Ellesmere Port, Neston, Skelmersdale, Golborne and Leigh.



Areas at Risk of Transport Related Social Exclusion. Source, Transport for the North

[17] https://transportforthenorth.com/reports/transport-related-social-exclusion-in-the-north-of-england/



Areas at Risk of Transport Related Social Exclusion compared to the average within each local authority area. Source, Transport for the North

An alternative way of presenting the TfN data is to see within each local authority area where there may be particular areas of concern (sometimes drowned out by viewing the previous data which reflects national benchmarks), and this is shown in the second map, above. Obviously, the same areas of concern seen on the preceding map are still highlighted, but wider areas of TRSE concern are now also evident.

The research by TfN identifies that there can be multiple causes of TRSE.

- In terms of public transport, frequency and coverage are issues (including hours of operations, for those on particular work patterns) – alongside cost. An earlier section of this evidence pack highlights how public transport costs have increased above inflation over a long timespan. Ease of access for those with a disability can also be an issue.
- For active travel, street design – including lack of pavements or cycle ways – is a factor, but included in this is also maintenance; cracked or broken pavements a particular issues for those with a disability, or others such as those with pushchairs. (Maintenance and upkeep is also a factor for cycleways). Severance is also an important factor to consider, where busy roads and/or few crossing points may increase journey times for those reliant on active travel.
- Feelings of safety cover both active travel and public transport and can result in TRSE. There may be specific groups within the population who feel particularly vulnerable to harassment and discrimination, including those who are disabled, female, from a minority ethnic group, or LGBTQ. Note that feelings of safety occur not just on public transport, but waiting at the stop/station, and walking/cycling to the nearest stop/station.

- Enforced car ownership is also a factor in TRSE. This is where the inability to access opportunities, services, etc., creates car dependency, even where household budgets may mean this results in other expenditure being curtailed.

Clearly from the causes listed above, it is clear that data from all the above factors is not available at a detailed level, and hence it is potentially the case that the mapping of TRSE risk is an underestimate.

Under current scenarios, the uptake of zero emissions represents a further potential risk to the likelihood of TRSE. This is down to a number of factors:

- High 'entry costs' compared to current new or second-hand vehicles
- Higher charging costs for those unable to charge at home
- Higher time costs for those unable to charge at home

TRSE represents a widespread issue now and in the future for the Liverpool City Region and its hinterland. Many of the background causes – including coverage and connectivity of the public transport network, cost, and feelings of safety – have already been identified within this evidence report as issues to be addressed.

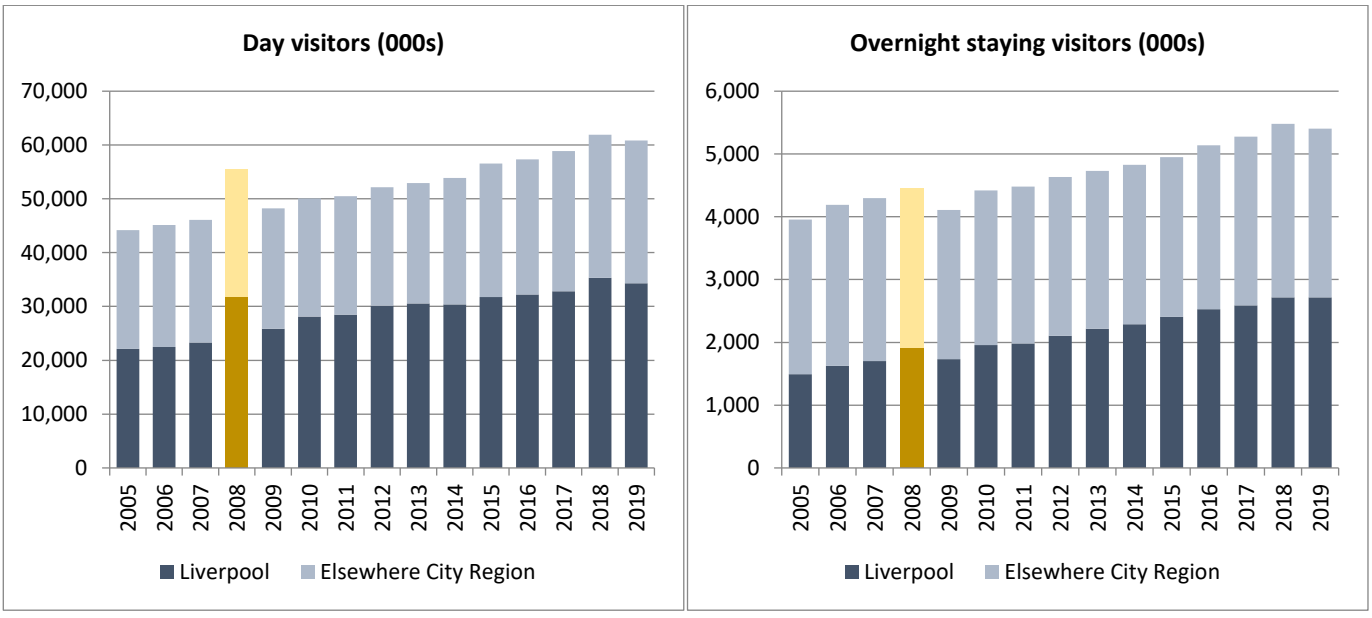
Section 11. Visitor Economy and Transport

The visitor economy sector has a symbiotic relationship with transport; improved transport helps destinations to grow, whilst in turn the visitor economy creates demand at the transport network, often on times outside of peak commuting demand. Going back some years, the railways essentially helped create many of the early seaside resorts and demand for leisure travel, and of course the focus now is increasingly on considering how leisure travel can be more sustainable.

In the Liverpool City Region, the visitor economy pre-COVID has seen strong growth, even above levels seen during 2008 when Liverpool itself was European Capital of Culture. This growth has been observed in both day visitor and the more valuable staying visitor markets, and as at 2019 generated £5bn in GVA and supported over 55,000 jobs. As the fifth most visited city in the UK by overseas visitors, the benefit of the sector is not just to the city region, but also a net benefit to the UK as a whole.

Besides the direct and indirect impacts this covers, there are further benefits of the city region's visitor economy to be accounted for; the visitor economy helps create a positive image for the city making it more attractive for investors; the associated infrastructure and streetscape creating a more attractive environment for both visitors and residents; and when it comes to transport, the demand from visitors helps support and establish links that might be less viable if only used by residents and local businesses.

Growth in the Liverpool City Region Visitor Economy



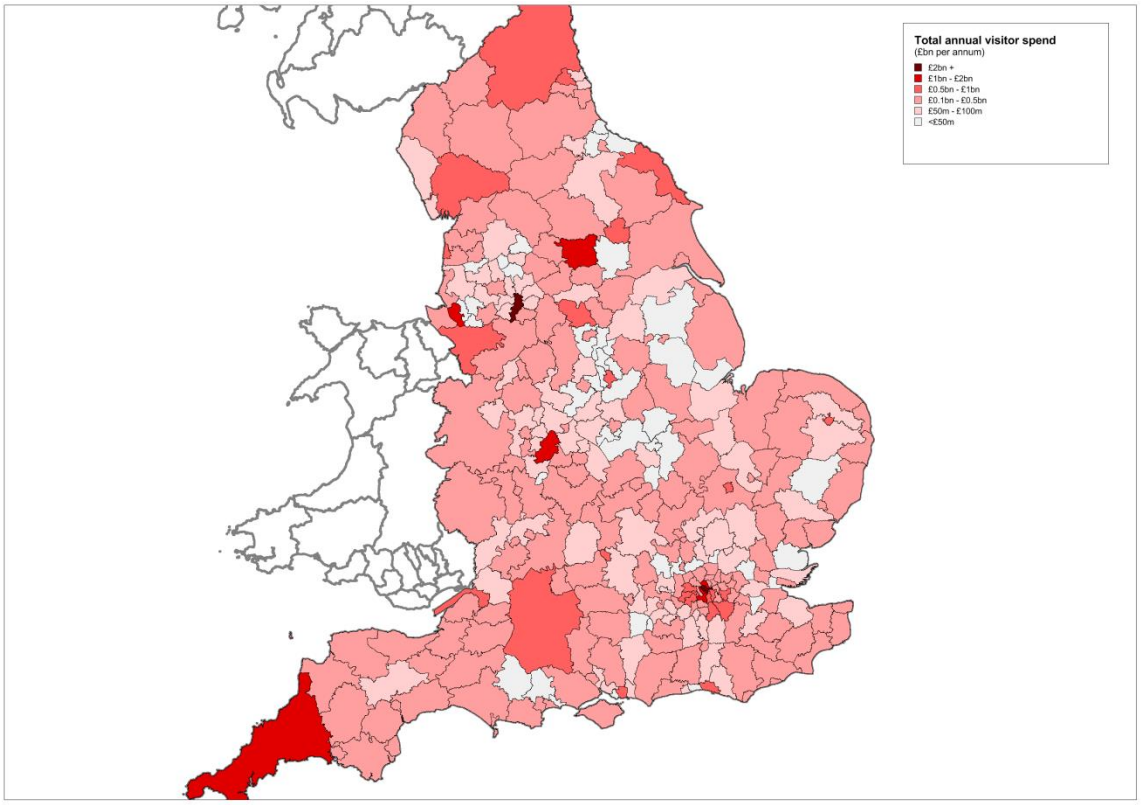
Visitor Economy volume; STEAM data by GTSUK for Liverpool City Region LEP

The Visitor Economy offer in the Liverpool City Region is wide ranging, covering multiple markets, including: Culture; Sports (viewing and participating); Short breaks and day trips; Conferences and exhibitions; Cruise ships; major events; and more.

Although Liverpool is the key destination there are multiple attractors generating demand across all local authority areas, including: Seaside resorts; Port Sunlight; Museums; and many others including of course the recently opened Shakespeare Theatre in Prescot. These multiple destinations need to be considered in the context of the connectivity analysis seen in earlier sections.

The strength of the visitor economy in Liverpool is visible when seen in contrast with other areas of England – although also raises the importance of 'dispersal', something transport is key to. The volume of visitors in its own right will naturally add to existing local demand from the resident population, and 2017 modelling by LCR CA suggested that – allowing for average length of stay – staying visitors in effected added 4.9% to Liverpool's population.

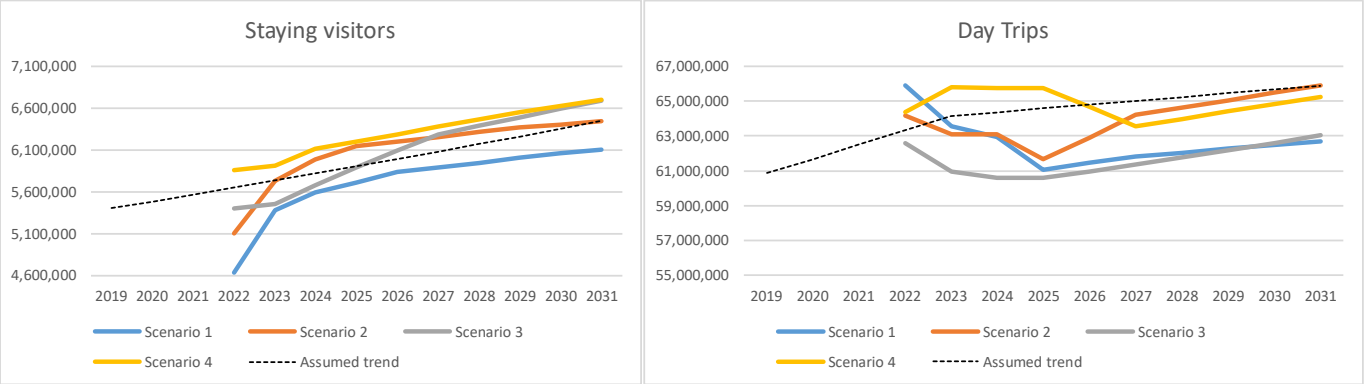
Spatial distribution of visitor spend (England only)



UKSTS / IPS, Visit Britain, 2017

Naturally, this is a sector that has felt the most significant impacts from COVID-19 restrictions; both restrictions within the UK and many source markets reducing demand. During 2021 a range of scenarios for visitor demand were considered, using multiple factors to understand how the sector might 'bounce back'. Although these now need to be updated to take into account recent factors such as the cost-of-living crisis, the overall message is positive when considering the mid- to longer-term, with continued growth in many scenarios, in some exceeding a baseline forecast. There is particularly the potential for growth in domestic staying visitors more than overseas staying visitors which raises distinct transport considerations.

Scenarios for recovery of the LCR visitor economy



LCR CA Modelling of visitor economy recovery; 2011

Mode use and visitor markets

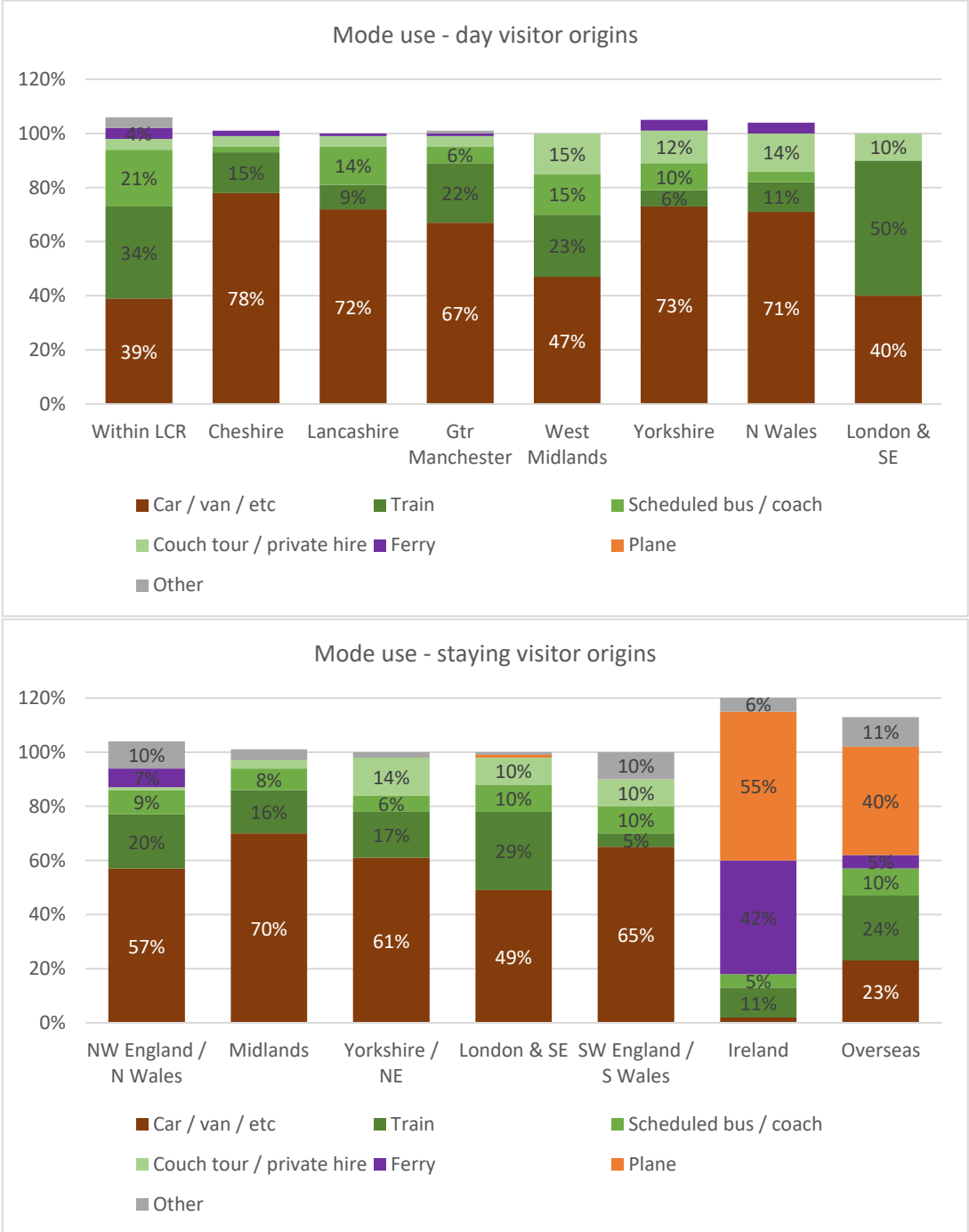
Transport considerations in this sector thus need to be considered in the same two aspects as the overall local transport plan; how can transport help the sector to grow, but at the same time address the need to reach net zero?

Key to understanding this challenge is to view the geography of visitor markets and their use of transport to reach the Liverpool City Region. Although as with much of the data this is pre-COVID, it does help us understand some of the markets – and note that since the survey, rail use was likely to have increased, given the growth seen in out-of-region journeys presented in the transport data section.

- Across almost all markets there are significant levels of car use – raising the importance of considering 'cross-border' journeys as seen in the section looking at connectivity.
- Day trips for tourism made by Liverpool City Region residents were far more likely to use public transport – although there were also higher levels of use seen by those coming from the West Midlands, reflecting on the more frequent rail service.
- The particularly high level of use of car for day trips from Cheshire, Lancashire and North Wales is of particular note – the reopening of the Halton Curve was particularly intended to help with the latter, but services have not yet been extended beyond Chester.
- Rail achieves a very high mode share across staying visitor markets from London and the Southeast, reflecting on the nature of the product (then offered by Virgin West Coast). Other domestic markets – in particular from other parts of the South – show much higher car use, potentially linked to the lack of direct services, as seen above.
- Although a majority of visitors from the island of Ireland arrived by plane – with this being a significant market for LJLA – 42% arrived by ferry. (Both the island of Ireland market and levels of ferry use may have increased further since, given the sizeable investment in the Birkenhead to Belfast link by Stena.)
- In terms of visitors from further afield, 40% indicated they used air on their journey. Those who used rail at some point (24%) will comprise a wide mix; for example, those arriving via Manchester airport; or in many emerging markets this may be Heathrow, then using the West Coast Main Line. It may also include those visiting Liverpool as part of a wider visit to the UK (for example, primarily focussed on London / Edinburgh, currently the two most visited cities). This is the hardest sector to consider in the context of net zero, given the

current lack of any immediate solutions for aviation (as referenced in Section 3). Note the 5% of those arriving by ferry (predominantly Dover, Harwich and Portsmouth) – in a scenario where consumer demand for *flygskam* becomes more prevalent this may increase, but only if landward provision for onward journeys from the ports are available.

Mode use split by market for each of day and staying visitors



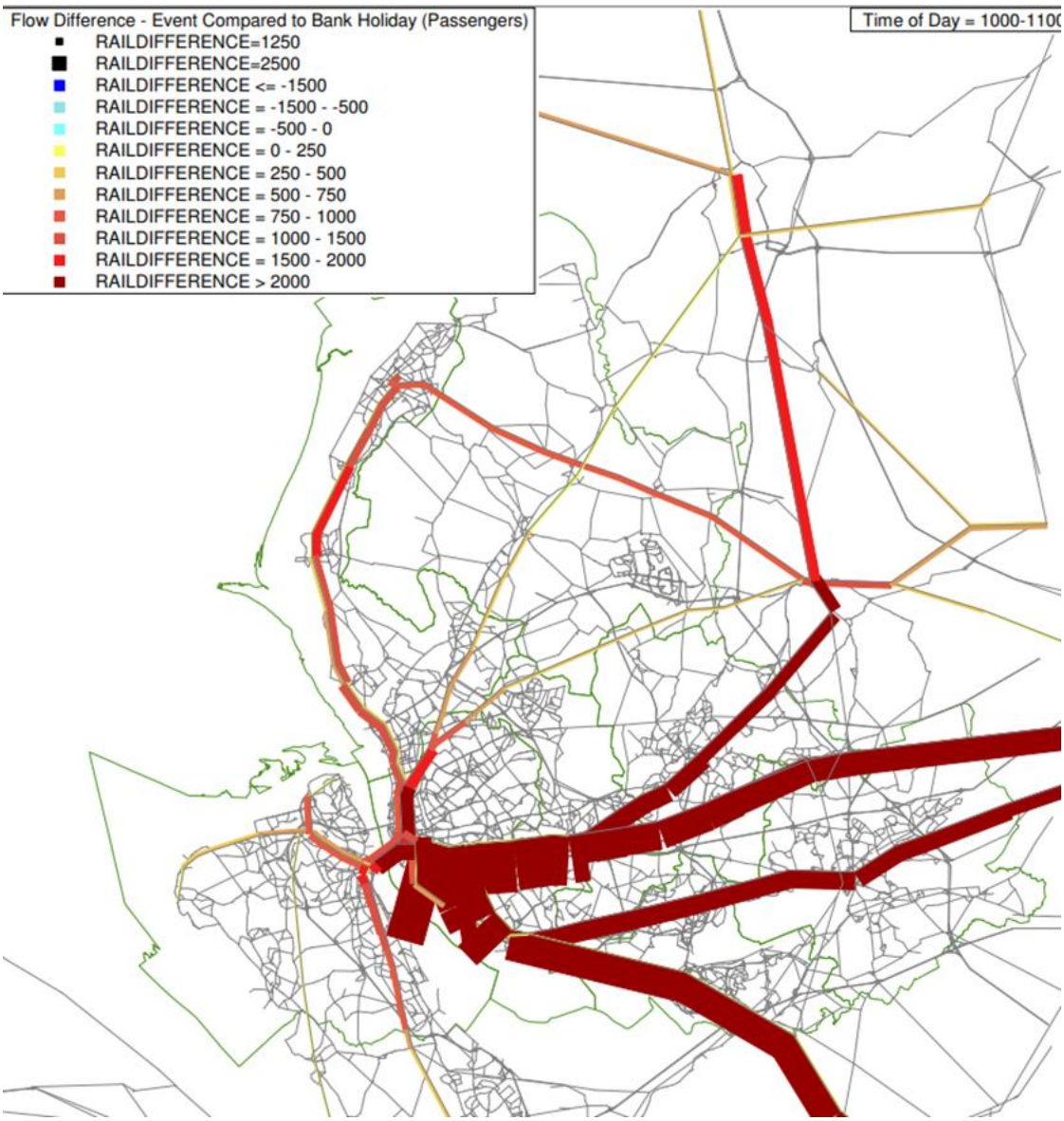
Digest of Tourism Statistics, Liverpool City Region LEP, 2015
Covers all modes used, so may add up to over 100%

A further specific element within this is that of major events which generate the need for transport services and strategy to deal with very significant increases in demand over a short period of time. Over recent years this has included regular or semi-regular events (such as the Grand National, Creamfields, Open Golf, Marathon and Half Marathon) to those headline events which are one offs,

such as The Giants, Three Queens, Parade of Sail, and Eurovision. These events draw in local, domestic and international visitors, showcasing the city region on a global stage.

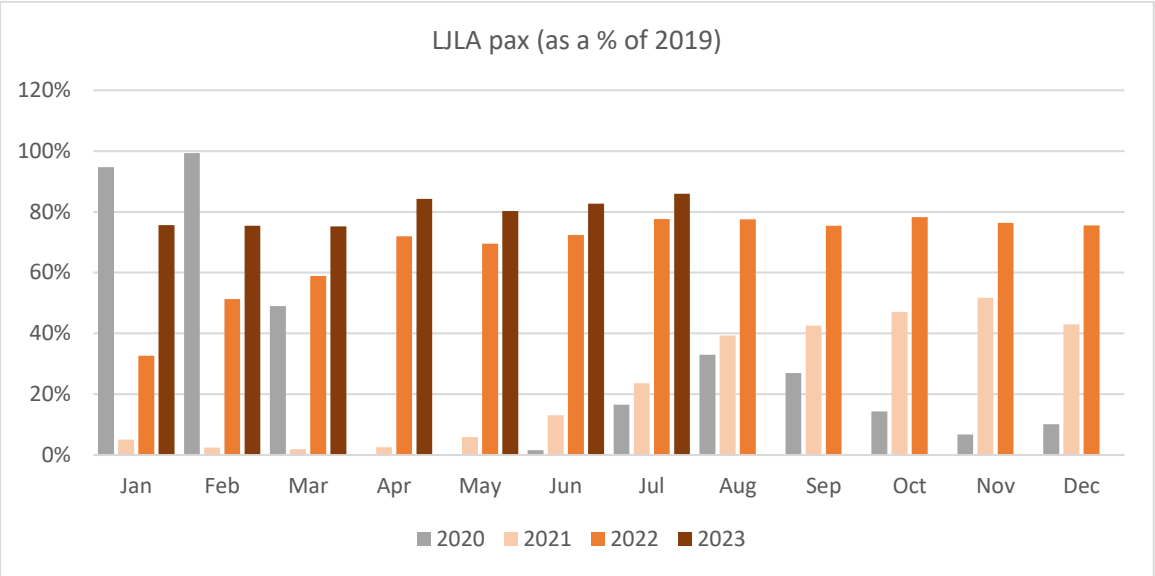
For example, the map shows the change in rail demand as modelled by LCRTM for part of the Three Queens events, when all three current Cunard liners performed a display in the river. This demonstrates the particular uplift on many routes, and the importance of ensuring the LTP considers the needs of major events on the network.

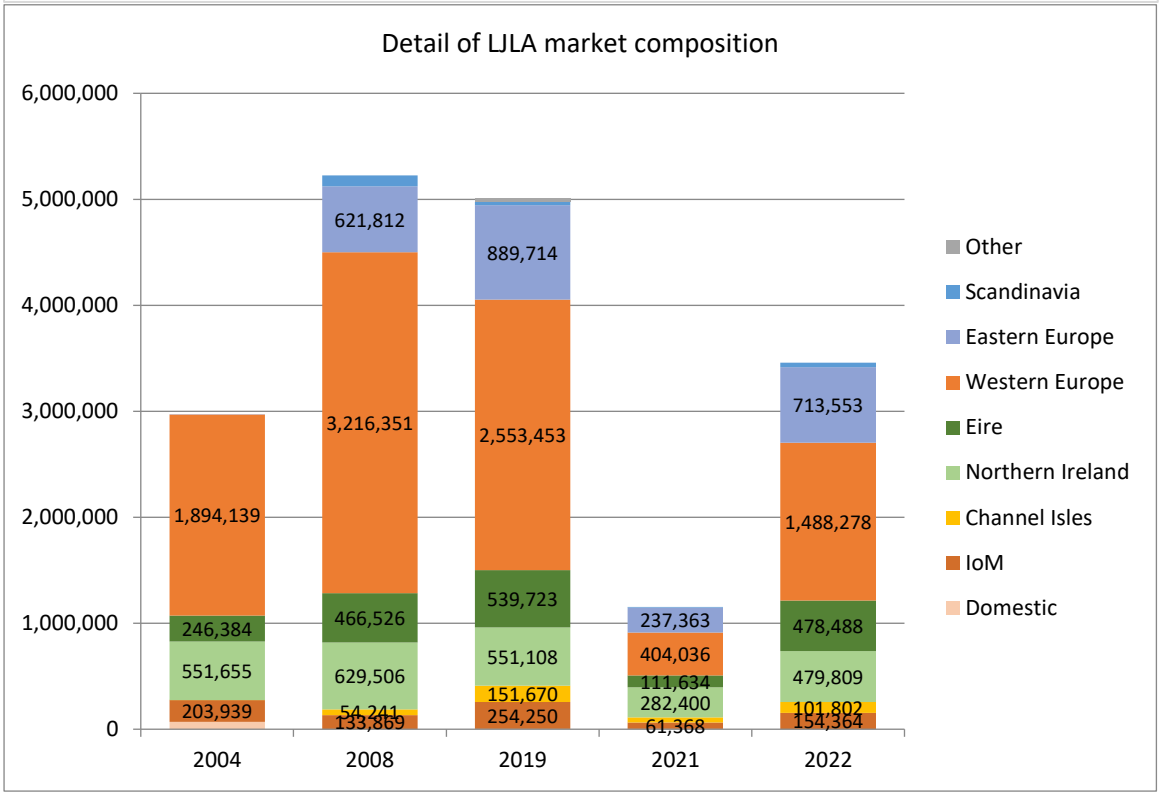
Rail impacts of a major event, estimated by the Liverpool City Region Transport Model



An important part of the visitor economy, serving inbound and outbound markets, in 2019 Liverpool John Lennon airport recorded 5.0m passengers. This is now recovering, and by July 2023 was at 86%

of 2019 levels. The airport sees a particularly consistent flow of travel to and from Irish markets, minimal domestic services, and with destinations in Western Europe the largest segment.





Nor to be overlooked as an important part of the transport demand though the city region are the ferry routes across the Irish Sea. In 2019 there were 648,000 passengers using the three main routes, and by 2022 this had increased to 801,000, with the route to Northern Ireland having seen particularly strong recent growth following significant terminal and new vessel investments.

Key gateways for Liverpool City Region Visitor Economy

The following table indicates the key gateways that visitors to LCR may be likely to use, and thus where attention may need to be given to connectivity (including elements that enable modal shift). These are not all possible gateways but based on markets are those most likely to be used – and some visitors may pass through more than one of these 'gateways' on their route to the City Region. Note that whilst these gateways are here highlighted as important to inbound visitors, they may also be important to LCR residents wishing to travel for leisure or business purposes.

For rail, the interchange experience may be of particular concern, even if the interchange point is not within the LCR. For Road, this means this route may see a higher-than-average level of motorists (and coaches) not familiar with the area, raising signage issues (especially for any interventions which may impact visitors, such as park-and-ride, congestion or clean air tolling).

Gateway	Mode	Markets
Liverpool John Lennon Airport	Air	UK Domestic; Isle of Man; Channel Isles; Ireland; short-haul European markets
Manchester Airport	Air	Remaining short-haul markets; transatlantic and global networks
London Heathrow	Air	Transatlantic and global networks
Pier Head	Sea	Cruise ship day visitors to the city and cruise ship turnarounds (passing through)
Central Docks (new terminal)	Sea	Isle of Man
Gladstone Dock	Sea	Irish market [car only]
Twelve Quays	Sea	Irish markets (including Northern Ireland)
Holyhead	Sea	Dublin and southern Ireland markets
Lime Street	Rail	Trans-Pennine; Midlands; London & Southeast markets
Liverpool South Parkway	Rail	Key rail/bus interchange to/from the Airport
Chester	Rail	North Wales; Marches (pending direct services)
Wigan North Western / Preston	Rail	Scottish markets (pending direct services)
Birmingham New Street	Rail	Interface with Cross Country markets
London Euston / St Pancras	Rail	Near-Europe markets via Eurostar
M62 and Rocket	Road	Majority of eastwards / southern road markets
M53 and Kingsway Tunnel	Road	Welsh; Irish; West Midlands
M58 and Switch Island	Road	Scottish road markets

This section has shown both the direct and indirect importance of the visitor economy to the Liverpool City Region and its intertwined relationship with transport. The challenge of meeting net zero is especially challenging here and flags up the importance of working with other geographies – including nationally – to establish and improve links that will both help grow markets, whilst ensure this growth is sustainable.

Section 12. Improving our data and monitoring LTP4

This detailed evidence paper has displayed the transport issues facing the Liverpool City Region, in the light of both its economic challenges and net zero. It shows both strengths and weaknesses, including where opportunities may exist, and flags up how patterns and demand may change in the future without substantive actions.

This document highlights key transport metrics, and many of these will be updated annually (together with summary commentary) to track changes during the lifespan of LTP4 – both to monitor progress and identify where further intervention may be needed. As part of this when there is less economic uncertainty or changes in the key areas of uncertainty, it will be advisable to revisit and improve on the future scenarios work.

But the drawing of this document has also highlighted a range of areas where the Liverpool City Region has an evidence base which is weaker than might be desired. The appendix includes a list of our core available datasets, but the areas for improvement are notable. These cover both what might be core metrics – the need to ensure we have robust data – but also data that will be important to support development and implementation of transport interventions:

- Core LCR Rail Data
- Core LCR Bus Data
- An update and refresh of the Countywide survey
- Improved modelling of user Transport costs, including ticketing
- O-D of non-port freight
- Data around LGV use for logistics and last mile intelligence
- Replacing the 2021 Census travel to work data
- User Insights, including non-user research, to ensure an understanding of how mode shift can be achieved
- Improved data and monitoring of flows on the key road network
- Road user safety, especially understanding perceive/actual issues in cycling safety
- Levels of digital connectivity

Of particular note is the 2021 Census. Usually transport bodies rely on the Census, which covers a wide range of data such as origin-destination, mode choice, distance travelled, etc., all of which is used not just as supporting numbers in business cases but also in transport models. The nature of the questions used in the 2021 Census and the travel behaviours of many at that time means this data is not a reasonable reflection of current travel behaviours, although this report has used some of what detail was available at time of going to print. Discussion of how this issue can best be resolved is under consideration by a number of organisations.

Appendix:

Key data available from the LCR CA transport evidence base:

Mode	Dataset	Variables	Detail
Bus	Bus patronage survey*	Bus passengers, purpose of journey, ticket type	LCR
Bus	Bus data	Bus passengers, Bus km	LCR
Bus	NBPS	Satisfaction with bus travel	LCR and operator
Ferry	Mersey Ferries Patronage	Ferry trips	By terminals
Ferry	Sea Passenger Statistics	Irish Sea Ferry passengers	By routes
Road	Mersey Tunnels	Tunnel traffic, vehicle class	By tunnel
Road	Traffic volume in km	Vehicle km by road class, vehicle km by vehicle type	LCR
Road	Road Traffic Statistics by Local Authority	No of vehicles, vehicle km, car km, LGV km, HGV km	Local Authority
Road	Census: Household car availability	Households with no car access, 1, 2, 3+ cars.	LSOA
Road	Licensed vehicles	No of vehicles licensed, vehicles licensed by type, ULEV vehicles licensed	Local Authority
Road	EV Charging Device Statistics	Publicly available charging devices, publicly available rapid chargers	Local Authority
Road	Domestic Road Freight Activity	Goods lifted / moved to/from NUTS2 areas	Local Authority
Rail	Rail patronage survey*	Rail passenger journeys, Rail passenger km, purpose of journey, Ticket type	LCR
Rail	Regional Rail Usage	Rail passenger journeys	LCR
Rail	Station Usage	Entries/exits at LCR stations, Interchange at LCR stations	By Station
Rail	NRPS	Satisfaction with rail travel	By operator [covers beyond LCR]
LJLA	Airport statistics	Terminal passengers, Freight	LJLA
LJLA	Route analysis	Passengers by destination	LJLA
LJLA	Airport surveys	Purpose of journey, mode of transport to airport, inbound/outbound split	LJLA
All modes	Census: Travel to work	Main mode for travel to work by residence, Main mode for travel to work by workplace, average distance travelled, Origin-Destination	LSOA
All modes	Mode share	Mode share of transport into key LCR centres	Key centres
All modes	Countywide Survey	Journey purpose, mode use, journey length	Local Authority
All modes	Connectivity	Internal LCR connectivity, External LCR connectivity, Hinterland connectivity	Varies
All modes	Indexed average fares*	Average bus fare, average Merseyrail fare, average tunnel toll	Varies
All modes	Prepaid ticket sales	Trio (all modes), Saveaway (all modes), Solo (bus only), MyTicket (bus only), Railpass (rail only)	Varies
Cycling	Cycle monitoring data	No. of cycling trips	LCR
Cycling	Walking and cycling statistics	Frequency of any cycling activity, Frequency of cycling for leisure, frequency of cycling for travel	Local Authority
Walking	Walking and cycling statistics	Frequency of any walking activity, Frequency of walking for leisure, frequency of walking for travel	Local Authority

Mode	Dataset	Variables	Detail
Port	Port Freight Statistics	Port throughput, by type of freight, by import/export, by country	Port of Liverpool
Carbon	Local authority and regional CO2 emissions	Total and per capita transport emissions, road transport emissions, other transport emissions	Local Authority
Carbon	Subnational road traffic fuel consumption	Total consumption, Consumption by vehicle type, consumption by road class	Local Authority
Socio economic	Mid-year population estimates	Total population, population age 65+, Children, working age	Local Authority
Socio economic	IMD	Latest IMD	LSOA

NB – some extra datasets which may /may not be available not shown

Data to be updated annually shaded green