Travel in London

Report 15

MAYOR OF LONDON

TRANSPORT FOR LONDON

EVERY JOURNEY MATTERS

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Travel in London report 15

Overview

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Travel in London is Transport for London's (TfL's) annual publication that summarises trends and developments relating to travel and transport in London. Its principal function is to describe how travel is changing and to provide an interpretative overview of progress towards implementing the Mayor's Transport Strategy. It also provides an evidence and analysis base for the general use of stakeholders and policymakers.

This fifteenth report covers trends and developments up to 2021 and into 2022, including the disruption brought about by the coronavirus pandemic from early 2020 and London's recovery since then. As well as describing overall travel trends, such as patterns of travel demand and mode shares, the report is broadly structured around the Mayor of London's key aims for transport, these being:

- Healthy Streets and healthy people
- A good public transport experience
- New homes and jobs

Travel in London is recovering from the pandemic, but there are some lasting legacies continuing to affect travel demand

The coronavirus pandemic brought widespread disruption to daily life and travel during 2020 and 2021, key features of which were described in previous Travel in London reports.

This report updates the position with a particular focus on developments that will be of significance as we build on the transport recovery so far.

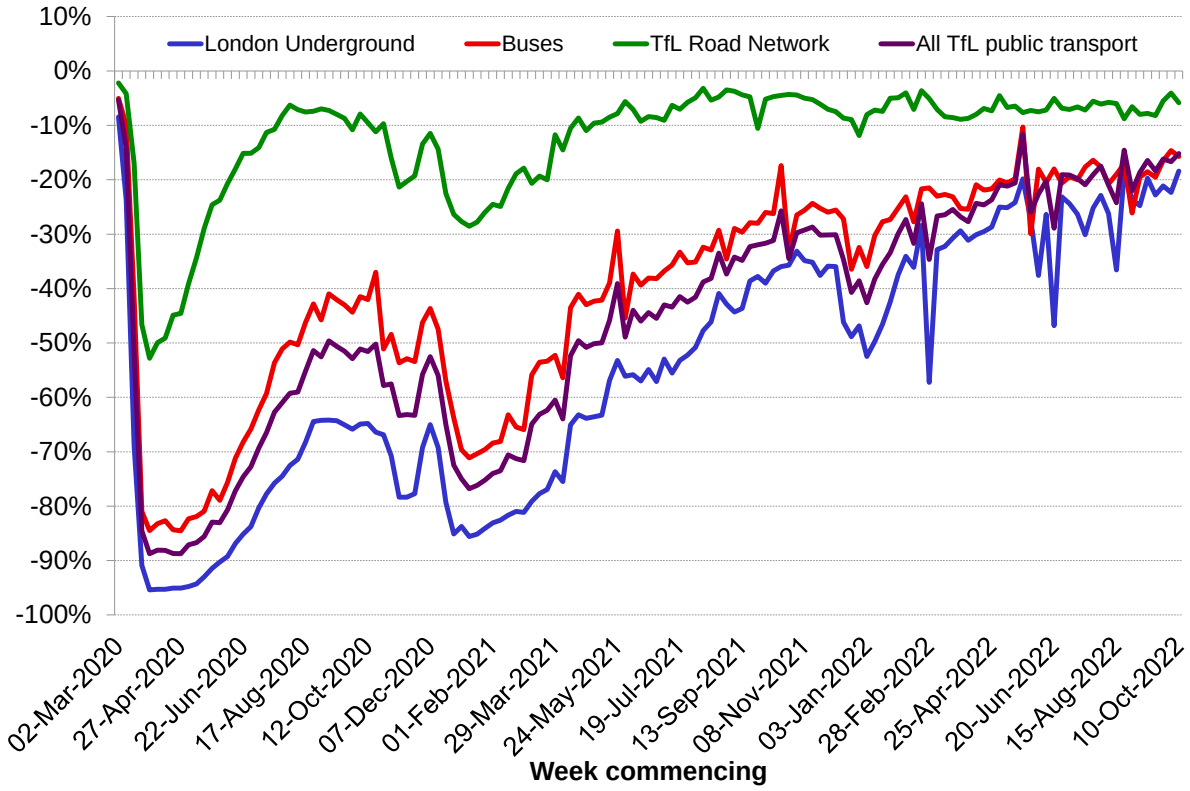
Travel demand and recovery trends on the main transport modes

Figure 1 shows the dramatic impacts on aggregate travel demand on key modes in London over the pandemic period, as well as the encouraging progress of London's travel recovery during 2022.

As of October 2022, representative average daily demand on the London Underground was about 82 per cent of the pre-pandemic levels. Bus demand was around 84 per cent of the pre-pandemic levels. Traffic on the TfL Road Network was about 94 per cent of the pre-pandemic levels, although it had been close to this level since early 2021.

The broad relativities between the modes established during the pandemic appear to have persisted into the recovery, although recent values for the London Underground are suggestive of a stronger recovery into autumn 2022.

Figure 1 Average weekly demand on the main transport networks compared to the equivalent week before the pandemic, Mar 2020-Oct 2022.



Source: TfL traffic and service performance data.
Note: Public transport trends are calculated as change in average seven-day flow from the equivalent week in 2019, where the averages have been adjusted to account for bank holidays on a like-for-like basis. The TfL Road Network trend, on the other hand, is an average of the day-to-day change from the equivalent date in 2019 for each of the weeks.

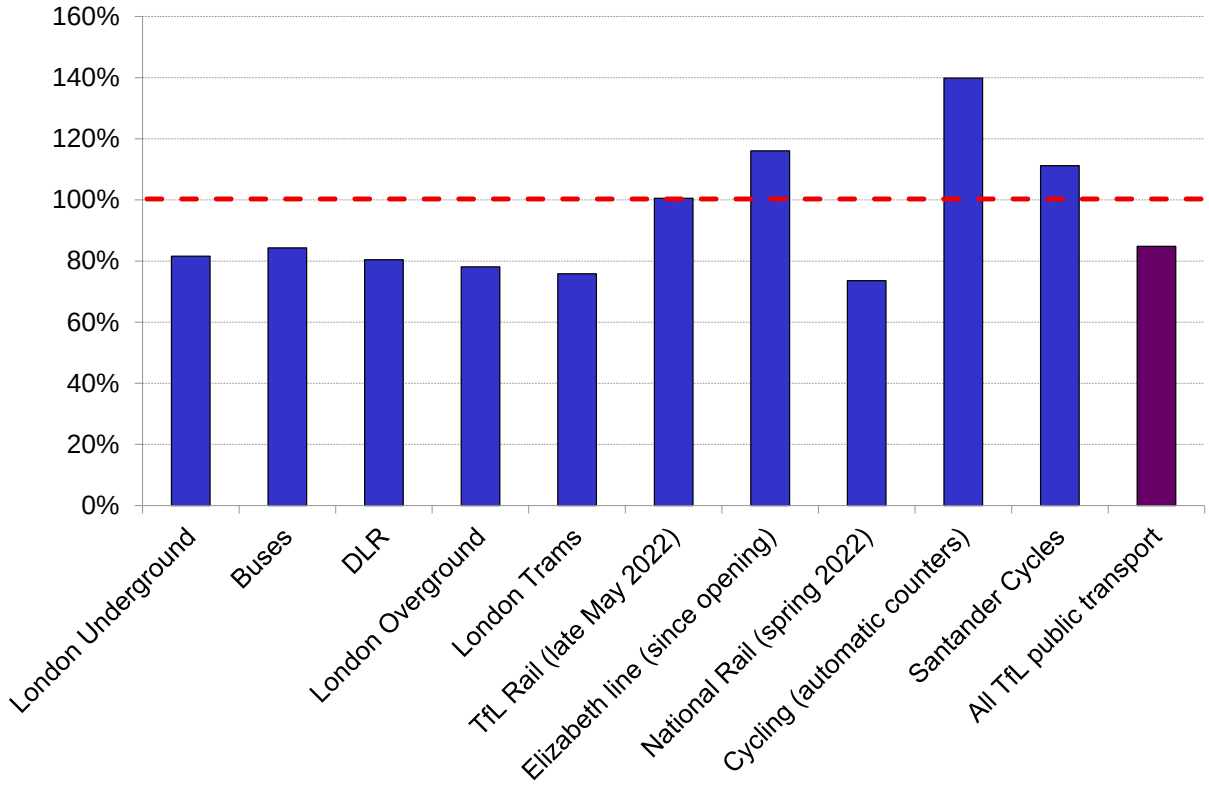
In interpreting the later months on figure 1, it should be noted that 2022 has been marked by a series of external, non-pandemic events that have disrupted activity and travel patterns (such as industrial action, the state funeral of Queen Elizabeth II and extreme weather events), and therefore it is not yet possible to discern clear trends that could be regarded as representing settled post-pandemic levels of demand. The persisting general upward trend for public transport, together with stable road traffic at slightly below pre-pandemic levels are, however, notable. As yet, there is no direct evidence of an immediate fuel price impact on London's major road traffic in 2022.

For comparison, figure 2 shows representative levels of demand on other transport modes relative to a pre-pandemic baseline, as of October 2022.

All public transport modes continue to show varying degrees of shortfall relative to the pre-pandemic demand, except for TfL Rail and the Elizabeth line, where comparisons are more complex due to the changes to services ahead of the full opening of the central section of the Elizabeth line in May 2022.

Cycling, on the other hand, currently exceeds pre-pandemic levels of demand.

Figure 2 Indicative average weekly demand on selected transport modes in London, autumn 2022 vs representative pre-pandemic baseline.



Source: TfL service performance data, TfL Cycle Hire, and Office of Rail and Road.
Note: Data is generally from the latest representative week in autumn 2022, except for TfL Rail, which shows the level as of May 2022 before the opening of the Elizabeth line; the Elizabeth line itself, which shows a representative level in autumn relative to its first week of operation; and National Rail, where demand reflects the latest available quarterly data.

- **DLR** and **London Overground** are typically seeing about 80 per cent of pre-pandemic demand, comparable to the position on the London Underground.
- **London Trams** recovery is slightly lower at just less than 80 per cent of pre-pandemic levels.
- The **TfL Rail/Elizabeth line** story is more complex. In the week before the opening of the central section of the Elizabeth line with services running between Paddington and Abbey Wood in late May 2022, TfL Rail services from Paddington and Liverpool Street were seeing a level of demand on a par with the equivalent pre-pandemic dates, likely reflecting the expansion of services over the last few years in the ramp-up to the Elizabeth line. The Elizabeth line itself, as of October 2022, was also showing an increase in demand of 16 per cent compared to the first week of operation in late May 2022 (shown in the graph). The initial impacts of the opening of the central section of the Elizabeth line are described in more detail in chapter 9 of this report.
- Demand for **National Rail** services in London (London and South East franchised operators) is updated quarterly, with the latest available data from April-June 2022 showing that journeys at that time, as the impact of the prolonged industrial action was starting to be felt, were at about 74 per cent of the pre-pandemic levels. By comparison, recovery at the Great Britain level as of October 2022 was at around 85 per cent of the pre-pandemic baseline.
- Finally, the latest indicative **cycling** trends from October 2022 from our limited sample of continuous automatic counters (mostly in central and inner London)

show weekly demand at some 140 per cent of the pre-pandemic baseline, with **Santander Cycles** hires at some 111 per cent of the pre-pandemic level as of late September 2022, maintaining the pattern seen during the pandemic of significant increases compared to pre-pandemic levels of cycling in London.

Key features of pandemic travel demand that have persisted into the recovery

These averages conceal important features of interest, many of which have been previously observed during the pandemic. The following are perhaps the most significant in terms of planning for the next phases of the recovery:

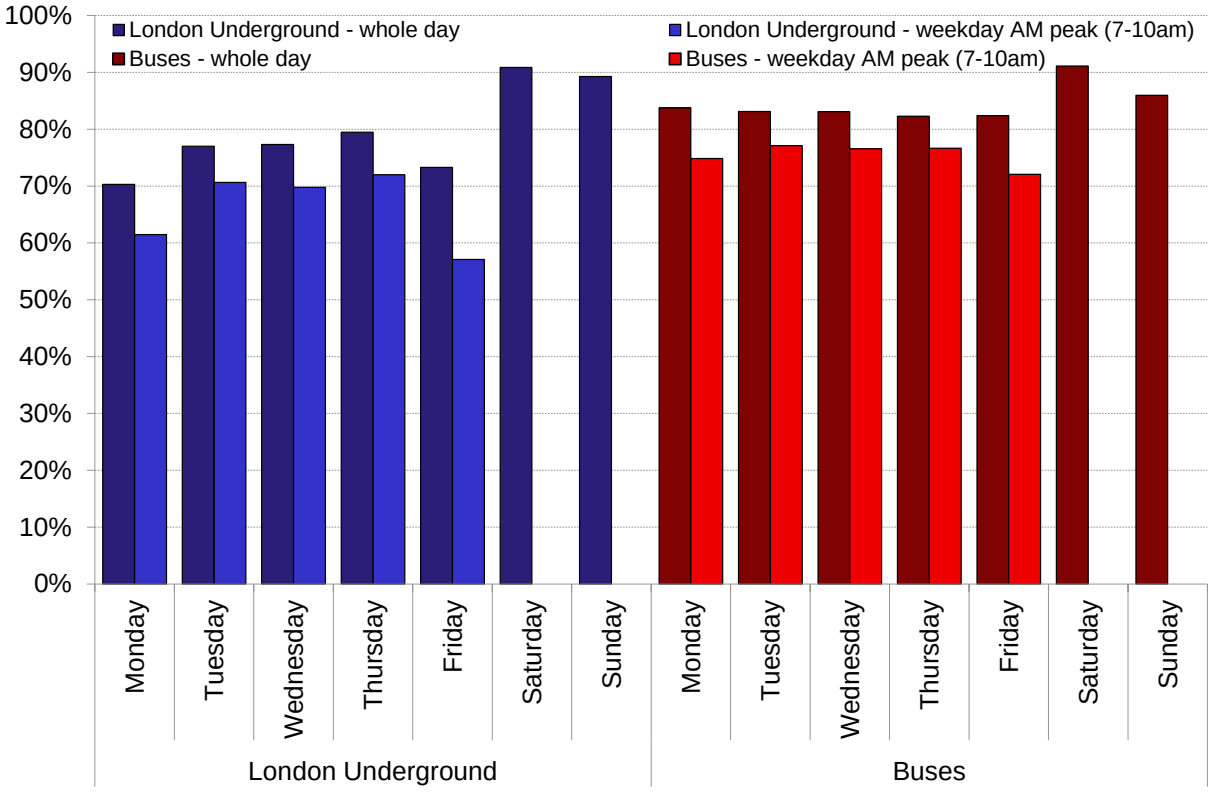
- **Relativities in demand and recovery between different modes**: A striking feature of the pandemic has been the uneven pace of recovery among different modes. These relativities have tended to persist into the recovery, although data from recent weeks suggest that these gaps are narrowing significantly.
- **Changes in travel demand by day of the week**: Another feature is the extent to which the pre-pandemic relativities among days of the week have changed, which is different across modes. On one hand, there do not seem to be any persisting changes in the distribution of road traffic and bus demand throughout the week either side of the pandemic. However, the opposite is true for rail (particularly London Underground), where recovery has been noticeably faster on weekends than on weekdays and where differences among the days of the traditional working week have been exacerbated, with central days (Tuesday to Thursday) now showing a relatively higher difference to Mondays and Fridays than before the pandemic (figure 3). This is particularly apparent on Fridays, which used to be the busiest weekday and are now one of the quietest, while Mondays were always the quietest and are now only slightly more so than before the pandemic.

Other features of pandemic travel demand that have largely dissipated

On the other hand, there are features of travel demand that changed dramatically during the pandemic, but which have already largely dissipated.

- **Changes in travel demand by time of day**: During the pandemic a noticeable redistribution of travel demand during the day was observed, with more travel in the early morning and in the inter-peak period and much subdued peak travel. These patterns, however, have progressively faded as the recovery has advanced (likely due to the lifting of restrictions, resumption of activity, return to workplaces and regained confidence to travel in the population, as well as other factors) so that currently the distribution of demand throughout the day follows again the traditional two peaks for most modes, albeit with some minor residual traces of increased demand in the inter-peak and the shoulders of the morning and evening peaks.
- **Changes in the spatial patterns of travel demand**: Similarly, at the beginning of the pandemic there was a dramatic change in the spatial pattern of travel, with much-reduced demand to and from central London and increased local travel outside the centre. As the recovery progressed, there has been a slow return to the previous pattern. However, the reduction of, in particular, medium- and long-distance commuting into central London due to flexible hybrid and remote working practices is still noticeable during the working week, and there continues to be relatively more travel in local areas than before the pandemic.

Figure 3 London Underground and bus demand recovery, whole day and morning peak, by day of week, week commencing 17 Oct 2022 vs week commencing 14 Oct 2019.



Source: TfL Technology & Data.

Hybrid working

The imperative to work from home changed with different stages of the pandemic and was one of the most prominent pandemic adaptations affecting Londoners' travel behaviour, despite it being an option available only to some.

Although Government advice to work from home has not been in place for more than a year, the scale of change and length of time it had to become embedded present obvious challenges for the recovery of pre-pandemic commuter travel, and it is expected that higher levels of home working will persist in the medium to long term.

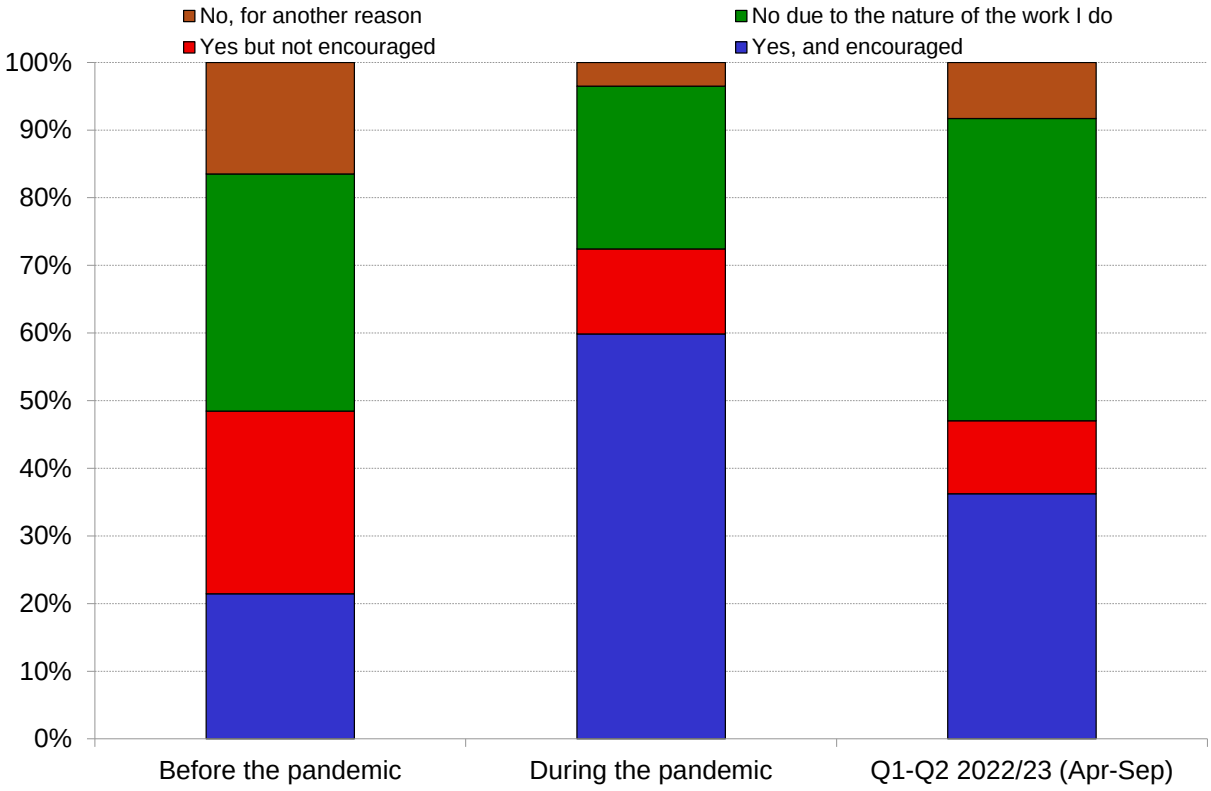
Figure 4, based on latest (provisional) data from the London Travel Demand Survey (LTDS) for London residents, relating to the first half of 2022/23, suggests that:

- Before the pandemic, just less than half of London resident workers (48 per cent) were able to work from home, although only 21 per cent of workers were encouraged to do so. Just more than half of workers (52 per cent) were not able to work from home, either due to the nature of the work they were doing (35 per cent) or for other reasons (16 per cent).
- During the pandemic, the proportion of London resident workers who were encouraged to work from home increased from 21 per cent to 60 per cent, with a further 13 per cent able to work from home, although it was not necessarily encouraged. This was a 24 percentage point increase in the share of workers who were able to work from home. The proportion who were not able to work from home decreased from 52 per cent to 28 per cent.

- The latest (provisional) LTDS data (April-September 2022) suggests that the proportion of resident workers who can work from home has returned to similar levels seen before the pandemic. However, the share who say they are encouraged to work from home is notably higher than it was before the pandemic (at 36 per cent compared to 21 per cent).
- On the other hand, the proportion of workers who say they cannot work from home due to the nature of the work they do has increased compared to before the pandemic (45 per cent compared to 35 per cent). The share of workers who say they cannot work from home for other reasons has decreased from 16 per cent before the pandemic to eight per cent. Further data is required to understand the extent to which these important trends stabilise as the recovery progresses.
- Of the people who said they can work from home in the first half of 2022/23 (April-September), more than one in four (26 per cent) said their employer expects them to attend their workplace between one and two days per week, 18 per cent said three to four days per week, six per cent said five days per week and 50 per cent said the number of days is flexible.

Rates of home working will continue to be monitored as more data becomes available.

Figure 4 Ability of London resident workers to work from home, LTDS, 2021/22-2022/23.



Source: TfL City Planning.

Discerning the medium- to long-term future

The extent to which the features of demand identified above, catalysed by the pandemic, will persist into the longer term is not yet clear.

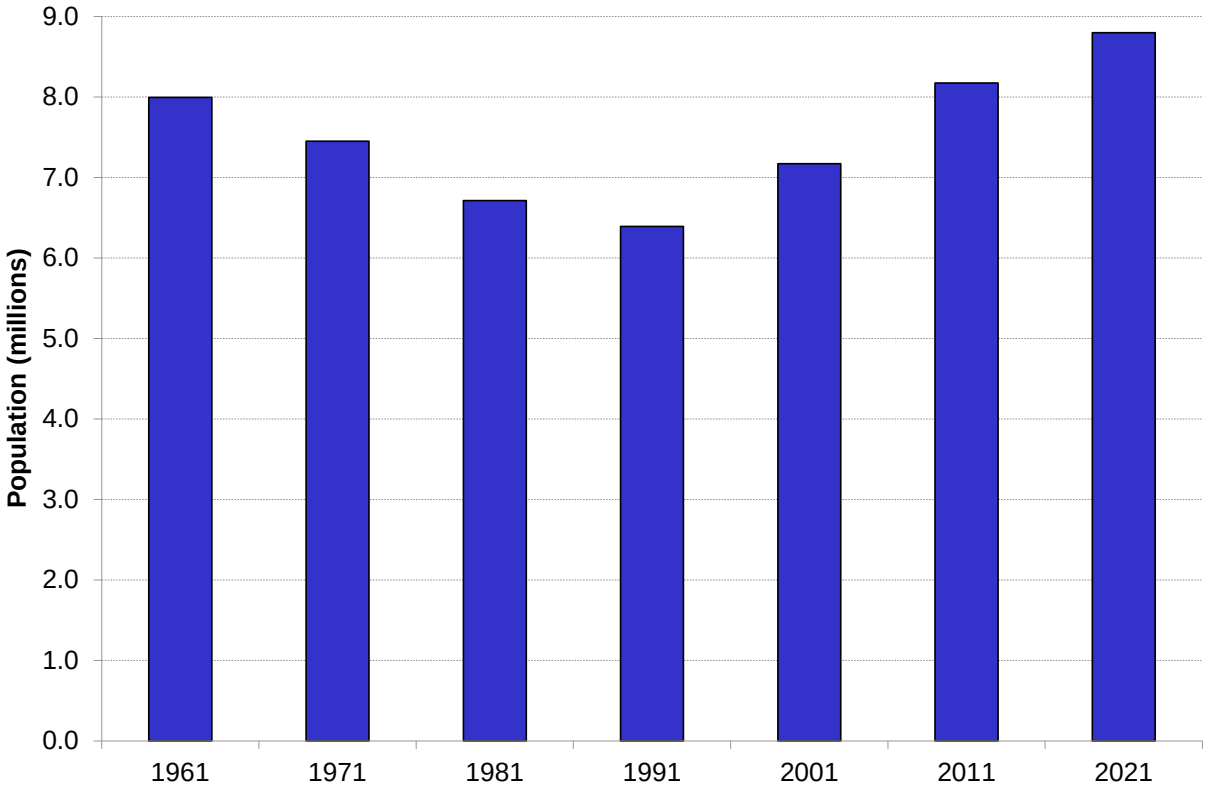
It seems likely that London's recovery has some way yet to run before the pandemic effects are fully eliminated and any post-pandemic legacy impacts fully embedded. There is also evidence of some longer-term changes to London's population from the 2021 Census and, of course, growing concerns over economic stability and the cost of living, both of which are likely to be significant for travel demand over the medium to long term.

London's population and the 2021 Census

A decennial Census of Population was conducted across the UK in March 2021 and the population in London is now estimated at 8.8 million.

While the timing reflected the later stages of pandemic restrictions, the Census gives the first firm, quantified estimate of London's population since 2011 (figure 5).

Figure 5 Long-term trend in London's resident population, 1961-2021.



Source: Office for National Statistics.

Although the data is still undergoing analysis by the Office for National Statistics, the following are the key emerging conclusions so far:

- The 2021 Census estimates London's population as 8.8 million, an increase of 7.7 per cent compared with 2011 (8.2 million). In contrast, the growth between 2001 and 2011 was 14 per cent. The 2021 estimate is lower than the mid-year estimate for 2020, which was 9.0 million.

- Population growth has been highest in east London, with low growth in southwest London and an indicated population decline in central and inner west London, perhaps reflecting temporary living arrangements during the pandemic restrictions that were in place at the time of the Census.
- London's population is getting older. The highest growth rates between 2011 and 2021 were in people in their 50s, 60s and 70s, with the largest in people in their 50s (30 per cent). The number of people in their 20s declined, as did the number of children aged under five.

The estimate of London's population in 2021 was lower than previously predicted and potentially reflects on the slowing of the rate of growth in demand, particularly for public transport, observed in the immediate pre-pandemic years and identified in previous Travel in London reports.

For the future, lower estimated population growth (and changing age profiles) will have implications for travel demand forecasts, yet to be updated to reflect the 2021 Census, and for our wider planning assumptions. These implications are currently being worked through.

London's economy

Previous Travel in London reports identified a prolonged 'income squeeze', stemming from the banking crisis of 2008, as a significant factor acting to depress per capita travel demand growth in the latter years of the last decade.

The pandemic itself, taking place in the context of the UK's departure from the European Union, has placed a large burden on public finances and had negative impacts across the economy, some of which are still apparent, for example labour shortages particularly affecting the service and leisure industries.

To add to this, there have been a series of emerging economic problems in 2022, all of which add up to a likely very challenging economic environment for travel demand and investment over the next few years.

In the context of international and political instability and potential lingering inequality impacts from the pandemic we are now also seeing rapidly rising inflation, which directly affects people's ability to afford travel itself and, perhaps more importantly, to partake in those activities which give rise to travel, such as leisure activities.

Although the Bank of England forecasts this to be a relatively short-term issue, inflation is currently circa 10 per cent, well above its target of two per cent, and the medium-term future is subject to considerable uncertainty, with wages not keeping pace.

The associated rise in interest rates, from historic record low levels, is also a significant emerging concern and could impact consumer spending and discretionary trip rates in the future, in similar ways to the trends seen as a result of the prolonged squeeze on disposable incomes in the last decade.

The pandemic also saw a collapse in international and domestic visitors to London, although airports serving London were back to about 80 per cent of pre-pandemic throughput by summer 2022. More recently, the relative devaluation of the pound sterling may act as an encouragement to international visitors.

Preparing for an uncertain future: TfL's revised scenarios

In 2019 TfL adopted a scenario planning approach to dealing with uncertainty to help ensure that our long-term plans are robust and resilient. Scenarios have been used across TfL and applications included the Capital Planning work, the Service Level Reviews, and in the development of a Hybrid Forecast of travel demand.

Now that London is recovering from the pandemic, our scenarios have been updated once more to build on previous work and reflect new long-term risks, challenges and opportunities.

Four new scenario narratives up to 2041 have been developed to reflect the envelope of uncertainty for our planning. The scenarios are intended to be plausible and internally coherent alternative futures for London, given what is known now, but they are not forecasts or predictions, and many combinations of circumstances could give rise to the outcomes illustrated for each of the scenarios. The intention is that the real future will lie somewhere within the envelope bounded by the scenarios.

The scenarios will be finalised and used with our two fully modelled forecasts for future planning:

- A Planning Forecast (formerly known as the Reference Case) for travel demand in London, with a high office return and London's population reaching 10.8 million by 2041.
- A Hybrid Forecast drawn from emerging evidence on how London is changing.

Forecast definition

Both forecasts contain the same portfolio of investment limited to only those schemes that are funded and committed.

The Planning Forecast includes a modest increase in working from home compared to pre-pandemic forecasts, with levels of online shopping remaining as forecast before the pandemic and London getting back on track for achieving pre-pandemic projections of population growth by 2041.

The Hybrid Forecast, however, incorporates evidence on how London is changing:

- The latest population and employment projections, following a more central trend than the Planning Forecast.
- More working from home for office workers, particularly for those on high incomes and for those working at offices in central London.
- A greater shift towards online shopping with people making fewer but more local shopping trips.
- Greater flexibility to undertake leisure trips as part of the working day due to more home working.
- Slightly higher relative car ownership, largely due to lower house building and a small minority of the population who are reluctant to return to public transport after the pandemic.

The very latest evidence has recently been reviewed as part of the annual update of the forecasts, and will incorporate:

- The latest population and employment projections, including some spatial redistribution of jobs in London.

- An increase in light goods vehicle (LGV) trips across London associated with more home deliveries and private use but with fewer trips to central London; alongside a drop in post-pandemic heavy goods vehicle (HGV) trips due to reduced activity in some of the main sectors (for example construction, general haulage and retail) and particularly in central London.
- Updated forecasts of the number of international visitors.

Consolidated estimates of travel demand and mode shares

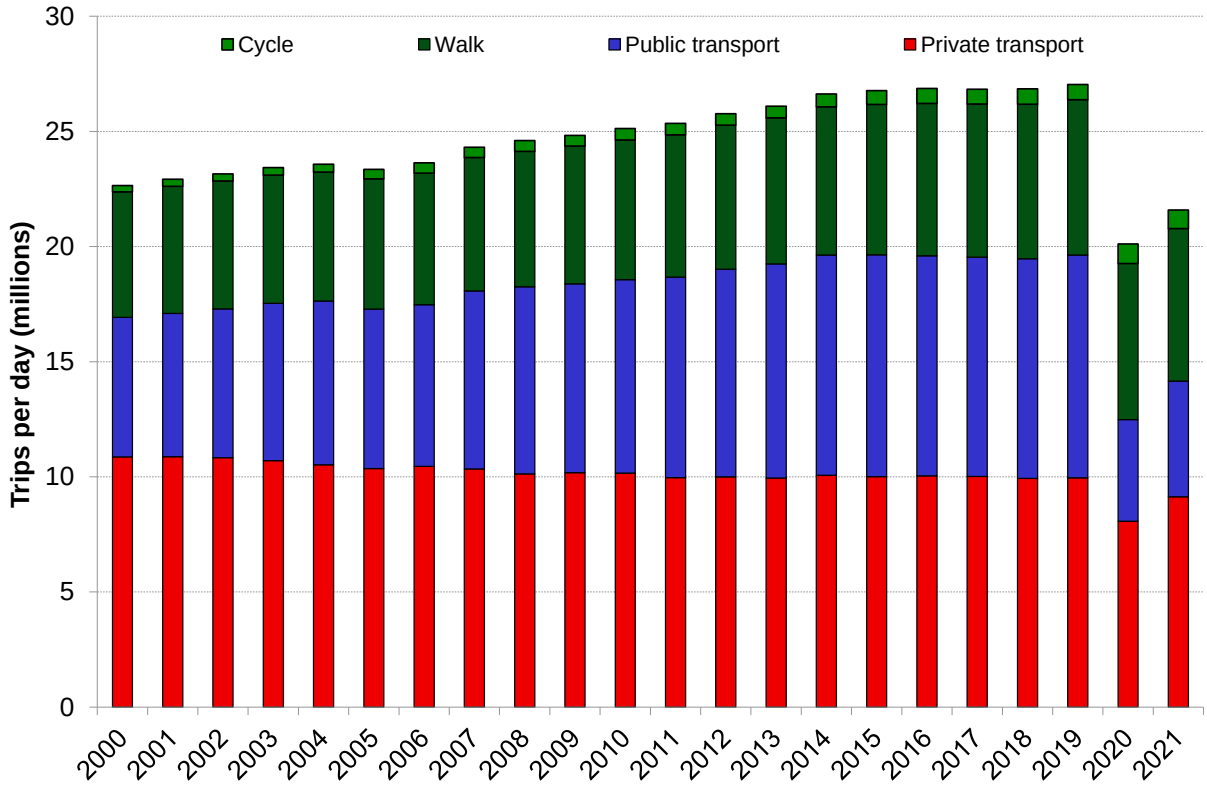
Historic and pandemic context

The years 2020 and 2021 were notable for the unprecedented variability in travel demand, this reflecting the impacts of the coronavirus pandemic and associated restrictions on many aspects of daily life. Annual averages and totals should thus be seen in this context. They should also be seen against the longer-term pre-pandemic trends of generally consistent year-on-year growth in travel demand in London, and the longer-term trend of increasing use of active, efficient and sustainable modes.

Before the pandemic, travel demand in London grew from 25.1 million trips per day in 2010 to 27.0 million in 2019, an increase of 7.6 per cent. The share of trips made by active, efficient and sustainable modes (walking, cycling and public transport) increased from 59.6 per cent in 2010 to 63.2 per cent in 2019, an increase of 3.6 percentage points.

Figure 6 shows these longer-term trends, alongside the scale of the pandemic-related change in 2020 and 2021.

Figure 6 Estimated daily average trips by mode, seven-day week, 2000-2021.



Source: TfL City Planning.

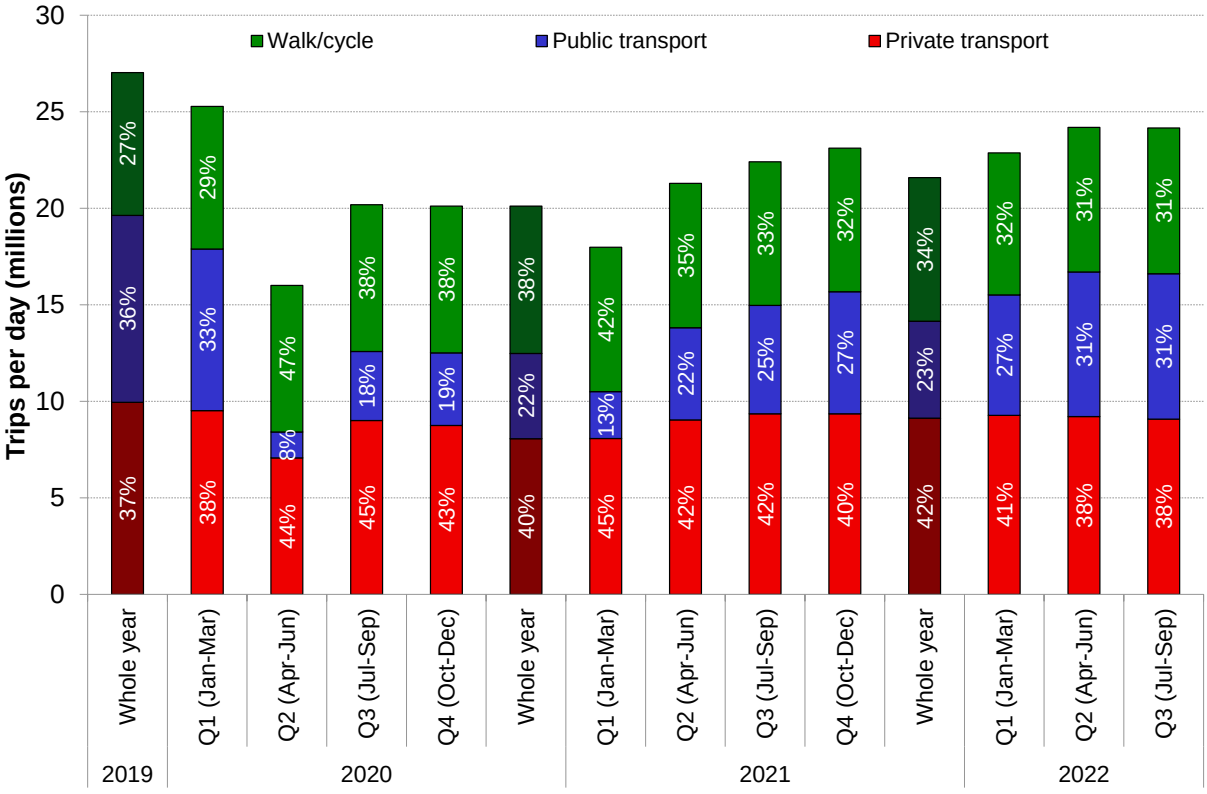
In 2021, it is estimated that 21.6 million trips were made on an average day. This is an increase of 7.3 per cent compared to 2020 but is still 20.1 per cent below the pre-pandemic level of 27.0 million in 2019.

As previously observed, these mode shares during the pandemic were relative to significantly lower levels of mobility. They also reflect a wholesale change to the nature of trip-making, for example a marked reduction in daily commuter trips and an increase in local trips by active modes, alongside changes to trip lengths, purposes and origin-destination patterns, as described in previous Travel in London reports. While therefore not generally comparable to pre-pandemic values, they do represent what might be regarded as a relatively resilient performance given the nature of pandemic restrictions, particularly affecting public transport patronage.

Total travel and mode shares during the pandemic

Figure 7 shows how estimated trips and mode shares varied during the pandemic.

Figure 7 Estimated quarterly trips and mode shares by mode, 2019-2022.



Source: TfL City Planning.

During relatively normal years, the overall mode share varies little by quarter. However, the pandemic impact can be seen throughout 2020 and most of 2021.

Public transport mode share declined significantly, with a gradual recovery following the lifting of restrictions. Despite the reduction in public transport usage, walking and cycling use remained relatively high as Londoners stayed local to do essential shopping or their permitted daily exercise.

The relaxation of all pandemic-related restrictions in early 2022 has led to a gradual increase in overall trips throughout 2022, with an estimated 24.2 million daily trips in

the quarter between July and September. This is still 11 per cent lower than in 2019 but is the highest estimated travel demand since the pandemic began.

Public transport mode shares have increased throughout the year, and are now at 31.2 per cent, with private transport mode shares declining to 37.6 per cent, only slightly higher than in 2019. Walk and cycle mode shares remain high, although they have been decreasing during 2022 as public transport demand has increased.

The overall active, efficient and sustainable mode share for travel in 2021 is estimated at 57.7 per cent, compared to 63.2 per cent in 2019 and 59.9 per cent in 2020. However, the gradual increase in public transport trips in 2022, coupled with high levels of walking and cycling has led to an increase in the active, efficient and sustainable mode share measure, which at 62.4 per cent in the quarter between July and September 2022 is at its highest level since before the pandemic began, only 0.8 percentage points lower than in 2019.

Active travel and the pandemic

In general, changes brought about by the pandemic supported a shift to walking and cycling, modes that were uniquely placed to cater for travel demand during periods of restrictions. Increased local travel at these times also bolstered use of active modes.

However, this took place in the context of overall reductions to activity, meaning that although mode shares for these modes were notably higher, absolute trip levels by these modes remained close to pre-pandemic levels.

Walking

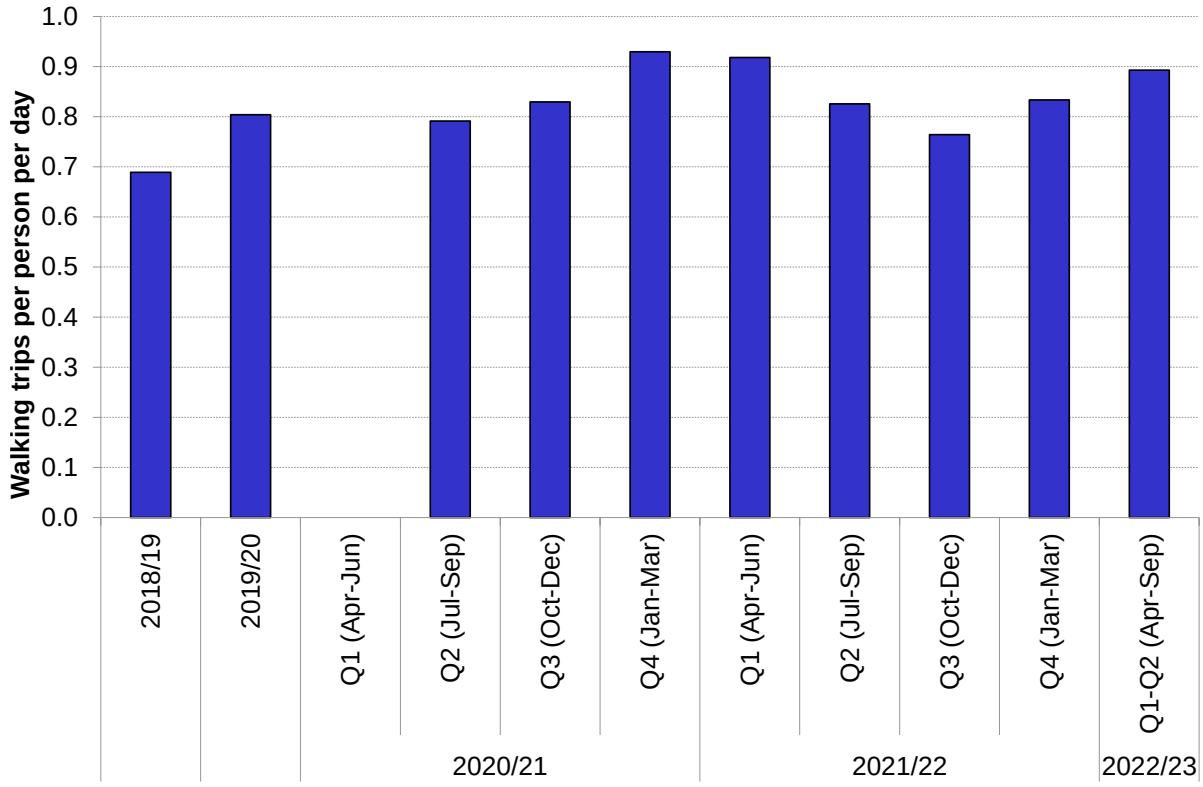
Our analysis of walking is mainly based on data from the LTDS. This shows that walking accounted for almost 60 per cent of all trips made by London residents (aged 17+) during restriction-affected January-March 2021 and typically more than 40 per cent during other periods of the pandemic, compared to 35 per cent before the pandemic. Most of these walking trips were local trips in inner and outer London.

The latest available data (April-September 2022) shows that the walking mode share for London residents was 41 per cent, lower than the pandemic average but still higher than representative pre-pandemic values.

Figure 8 shows the trend in walking trips per person per day throughout the pandemic and suggests that, in general, walking trip rates were higher than the pre-pandemic 2019/20 average of 0.8, ranging between 0.79 and 0.93 throughout 2020/21 and 2021/22.

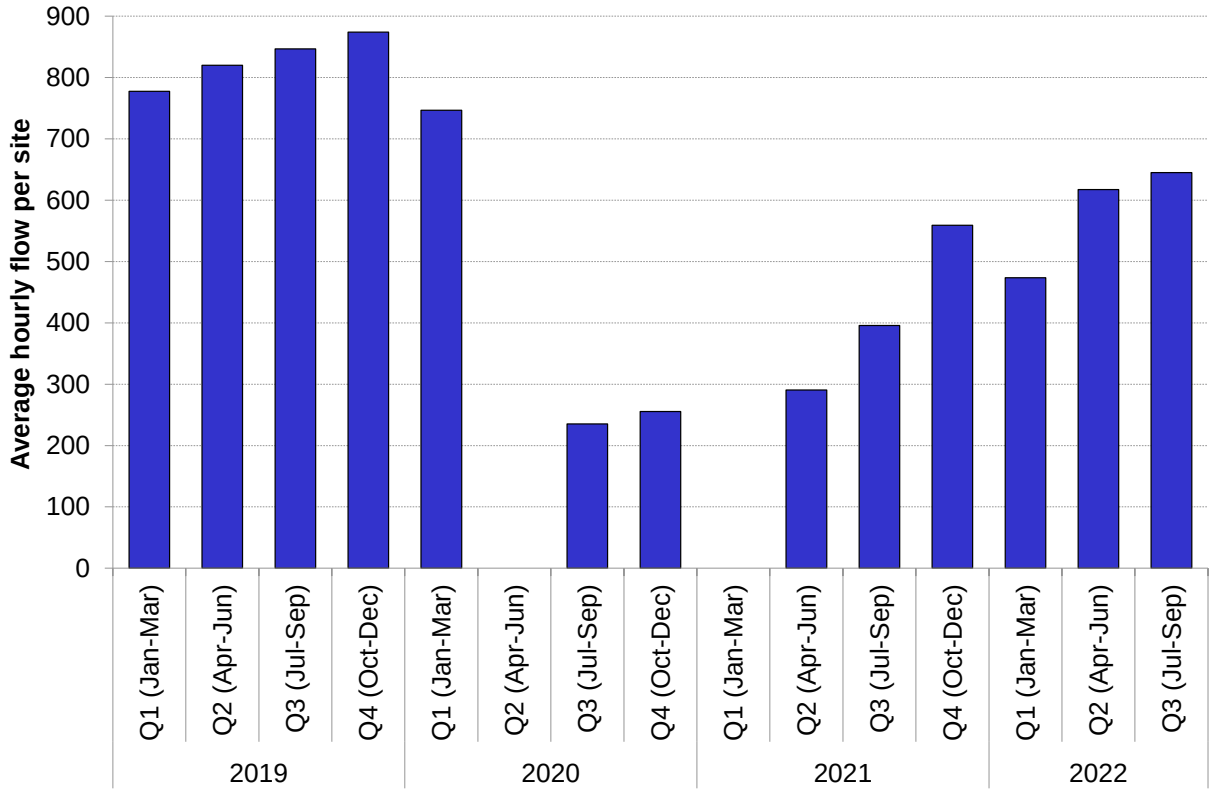
The latest (provisional) data from April-September 2022 shows that the walking trip rate is 0.89, 11 per cent higher than the 2019/20 (pre-pandemic) average and seven per cent higher than the value in the quarter between January and March 2022. This corresponds with higher overall rates of travel in the most recent data.

Figure 8 Walking trip rates by quarter, London residents aged 17+, LTDS, 2018/19-2022/23.



Source: TfL City Planning.

Figure 9 Average hourly pedestrian flow by quarter, central London, 2019-2022.



Source: TfL City Planning.

Looking specifically at our quarterly survey of pedestrian populations in central London (figure 9), the scale of the pandemic impact on footfall here is clear.

The surveys show a steady increase in pedestrian activity throughout the latter part of 2021 and into 2022, but pedestrian activity in July-September 2022 remained 23.8 per cent below pre-pandemic levels.

This trend is similar to that seen on the London Underground and reflects upon both the immediate pandemic impacts on commuting and other agglomerative activities as well as a lack of visitors, and hints at a potential longer-term reduction in footfall in central London.

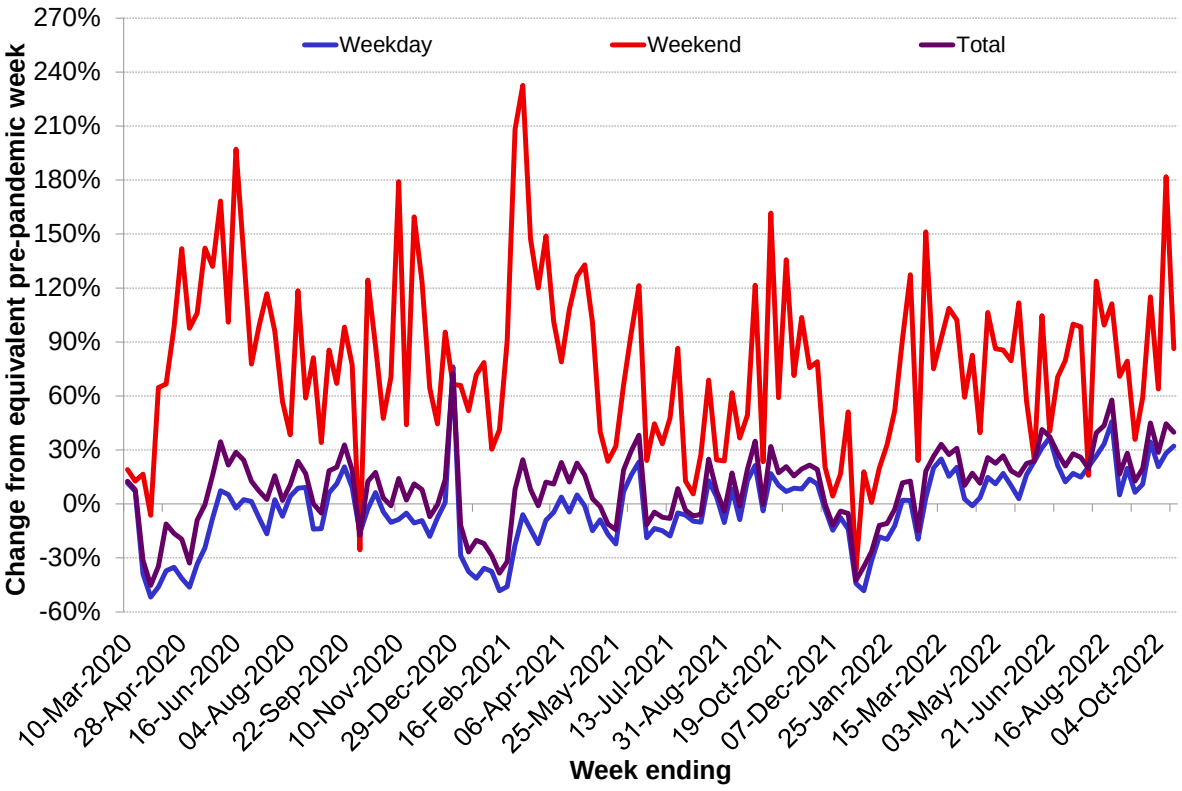
Cycling

Looking at cycling and noting that the data is based on a small sample of sites in central and inner London that provided continuous data throughout the pandemic, figure 10 shows how the overall impact of the pandemic was to boost cycling, particularly at weekends.

Although weekday commuter cycling was curtailed for lengthy periods in line with working from home restrictions, weekday demand was overall comparable to pre-pandemic levels, in sharp contrast to other modes. This demonstrated the utility and attractiveness of cycling as a leisure mode during this time.

In the latter months of 2022, some of these patterns are persisting with the more general return to normal activities, albeit in the context of fine weather and other factors affecting the wider transport network. Representative weekday demand was some 20-25 per cent higher than before the pandemic, with weekend demand still typically around 90 per cent higher.

Figure 10 Cycle flow at automatic cycle counters, Mar 2020-Oct 2022 vs 2019.



Source: TfL traffic data.

Excepting the strict lockdown periods, Santander Cycles (which mostly serves central and some parts of inner London) enjoyed record patronage during the pandemic and continues to see demand above pre-pandemic levels. This was especially remarkable given markedly reduced activity levels in central London throughout the pandemic.

Finally, a look at our revised consolidated estimates of cycling across London confirms that post-pandemic cycling levels in spring 2022 were firmly above the pre-pandemic baseline, with weekday cycle kilometres travelled in London 18 per cent higher in 2022 compared to 2019 and the seven-day average number of trips 14 per cent higher over the same period. The highest growth was seen in central London, followed by inner and outer London.

London's cycle network

By 2025, TfL wants the proportion of Londoners living within 400 metres of a high-quality cycle route to increase to 33 per cent. By autumn 2022, this proportion was 21.9 per cent, up from 19.4 per cent in autumn 2021 and 11.5 per cent in 2019 before the pandemic.

While much of the recent cycling infrastructure was delivered in 2020 and 2021 on a temporary basis as part of the Streetspace for London programme in response to the pandemic, the focus is now on assessing the performance of experimental schemes to make informed decisions about permanency as well as resuming and progressing work in other pipeline strategic connections.

Active travel: physical activity through travel

The Mayor's active travel target is for all Londoners to achieve at least 20 minutes of active travel (defined as either walking or cycling) per day by 2041.

The historic trend prior to the pandemic was relatively flat, with typically about 40 per cent of Londoners achieving this benchmark (figure 11).

Although comparable quarterly estimates are available during the pandemic, restrictions on surveys mean that the picture is not complete. Nevertheless, results suggest that the proportion of London residents achieving the target decreased during the pandemic, with quarterly estimates ranging from 33 to 37 per cent.

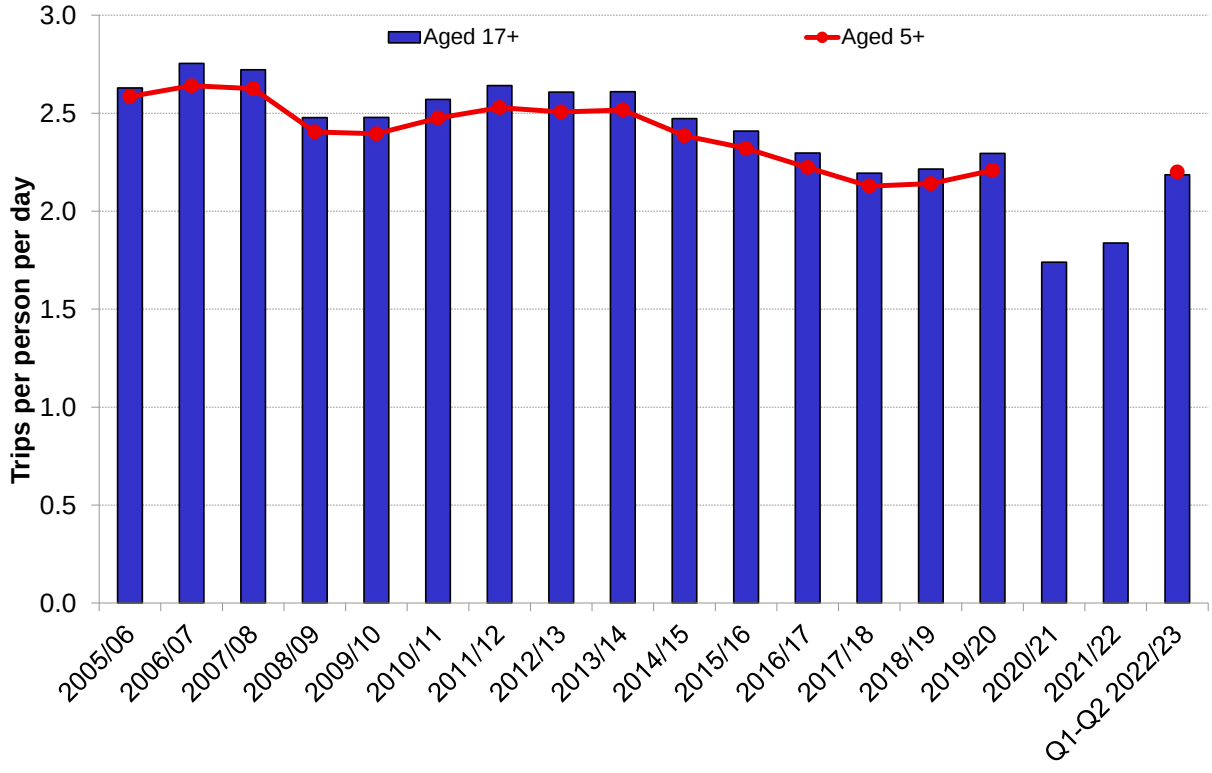
This reflects a combination of formal pandemic restrictions limiting travel and a range of informal personal responses to the pandemic, reducing individual travel overall, for example the walk journey stages frequently associated with commuting trips.

The latest data for April-September 2022 shows that the proportion of London residents achieving the target increased to 38.3 per cent, up from 34.4 per cent in January-March 2022 and returning to the pre-pandemic trend.

Figure 11 Proportion of London residents aged 20+ who achieve at least 20 minutes of active travel per day, LTDS, 2008/09-2022/23.

Source: TfL City Planning.

Figure 12 Trip rate, London residents, LTDS, 2005/06-2022/23.



Source: TfL City Planning.
Note: The historic series has been amended to represent those aged 17+ for consistency with the adapted data collection during the pandemic. The line shows the trend for those aged 5+ (the usual survey methodology).

Per person trip rates

Trip rates are a basic indicator of travel, relating to the number of trips undertaken on an average day.

The LTDS has tracked a pattern of generally falling trip rates over its lifetime, this trend accelerating between 2013/14 and 2017/18 (figure 12).

However, in the two years prior to the pandemic, the number of trips per day made by the average London resident increased slightly, to 2.21 trips by those aged 17+ in 2018/19 and 2.29 in 2019/20 (thought to be due to improving economic conditions).

The following are some of the key trends in trip rates during the pandemic:

- The annual average trip rate was six per cent higher in 2021/22 than in 2020/21, at 1.84 trips per person per day.
- The latest (provisional) data from the first half of 2022/23 (April-September) shows that the trip rate has increased to 2.19 trips per person per day, an increase of 19 per cent on 2021/22 and only five per cent below the 2019/20 average.
- The average distance travelled per person per day in 2019/20 was 9.4km. This reduced by 47 per cent to 5.0km in 2020/21, increasing by 17 per cent to 5.9km in 2021/22. The latest provisional data for 2022/23 (April-September) shows that the average distance travelled per person is 8.7km (seven per cent below the pre-pandemic average and following the pattern of trip rates).

Thus, according to the latest (indicative) LTDS data for London residents in the first half of 2022/23, both trip rates and average trip distances were recovering to pre-pandemic levels; yet there were still significant differences in patterns of demand on the wider transport networks.

The LTDS was reinstated to its full pre-pandemic form from April 2022, and a fuller picture of London residents' post-pandemic travel will be available in summer 2023.

Opportunities to increase active travel and contribute to the Mayor's mode share aims: potentially switchable trips

TfL has developed an activity-based modelling capability which opens many new avenues for policy appraisal and analysis.

One application is determining the modal 'switchability' of trips currently made by London residents in London, in relation to the Mayor's aim for 80 per cent of trips to be made by active, efficient and sustainable modes by 2041.

This analysis accounts for the characteristics of trips (distance, origin and destination locations and the availability of alternatives), and the characteristics of the people making those trips (for example, age and income). It shows that, considering a 2026 forecast year, some 21 per cent of London residents' car trips could be assessed to have a high likelihood, with appropriate incentives, of switching from car to active, efficient and sustainable modes. If this were achieved, it would bring the percentage of trips made by these modes to 73 per cent.

Road traffic in London

Previous Travel in London reports have tracked a picture of gradual change in London's road traffic over the last decade or so, the key elements of which are:

- A slow but generally consistent trend of reducing traffic volumes in central and inner London, contrasting with relatively stronger growth on public transport, contributing to a progressive increase in the active, efficient and sustainable mode share. Traffic volumes in outer London have, however, grown over this period.
- Different trends affecting the different motorised modes, with generally lower car traffic, higher freight and servicing traffic, particularly light goods vehicles (LGVs), and a dramatic increase in the number of private hire vehicles (PHVs).
- The introduction of, and responses to, various policies potentially affecting road traffic, notably the central London Congestion Charge and the Ultra Low Emission Zone.
- A progressive increase in traffic congestion in the pre-pandemic period.

Following a review of its National Road Traffic Statistics, the Department for Transport has further revised its estimates of road traffic volumes in London (see the Road traffic estimates in Great Britain: 2021 website). This revision has the effect of increasing the estimated vehicle kilometres driven in London by between eight and 10 per cent, depending on the year, compared to the previous estimates.

It is important to recognise that the revisions to DfT's estimates are mostly due to methodological improvements in the calculation of benchmark estimates for 2009 and 2019, and not due to a change in observed year-on-year trends.

Although showing the immediate impacts of the pandemic during 2020 and 2021, TfL's own estimates of road traffic volumes, for example those crossing our strategic monitoring cordons, corroborate this long-term picture, and show significant shifts in the composition of road traffic in the pre-pandemic period, as well as during the pandemic itself. A full assessment of settled post-pandemic traffic composition is not yet possible.

Goods vehicles in central London

A specific aim of the Mayor's Transport Strategy is to reduce the number of light and heavy goods vehicles circulating in the central London Congestion Charge zone during the weekday morning peak, by 10 per cent by 2026, from 2016 levels.

Before the pandemic, the overall trend was compatible with good progress towards this aim. By early 2021, however, reflecting the pandemic, the reduction in the number of freight vehicles was more than 20 per cent against the 2016 baseline. As this is for the central London Congestion Charge zone only, this does not reflect the increase in home deliveries during this period, given the low numbers of residential properties in this part of London.

As restrictions were lifted in 2021 the number of freight vehicles started to increase but remained around 16 per cent below 2016 levels in October 2021. During 2022, the number of freight vehicles declined slightly, and by October 2022 was 19 per cent below 2016 levels.

Changes to the Congestion Charge scheme in central London

Changes to the Congestion Charge scheme

Several changes to London's Congestion Charge scheme have been implemented in recent years to address the transport challenges arising from the pandemic and to support London's recovery.

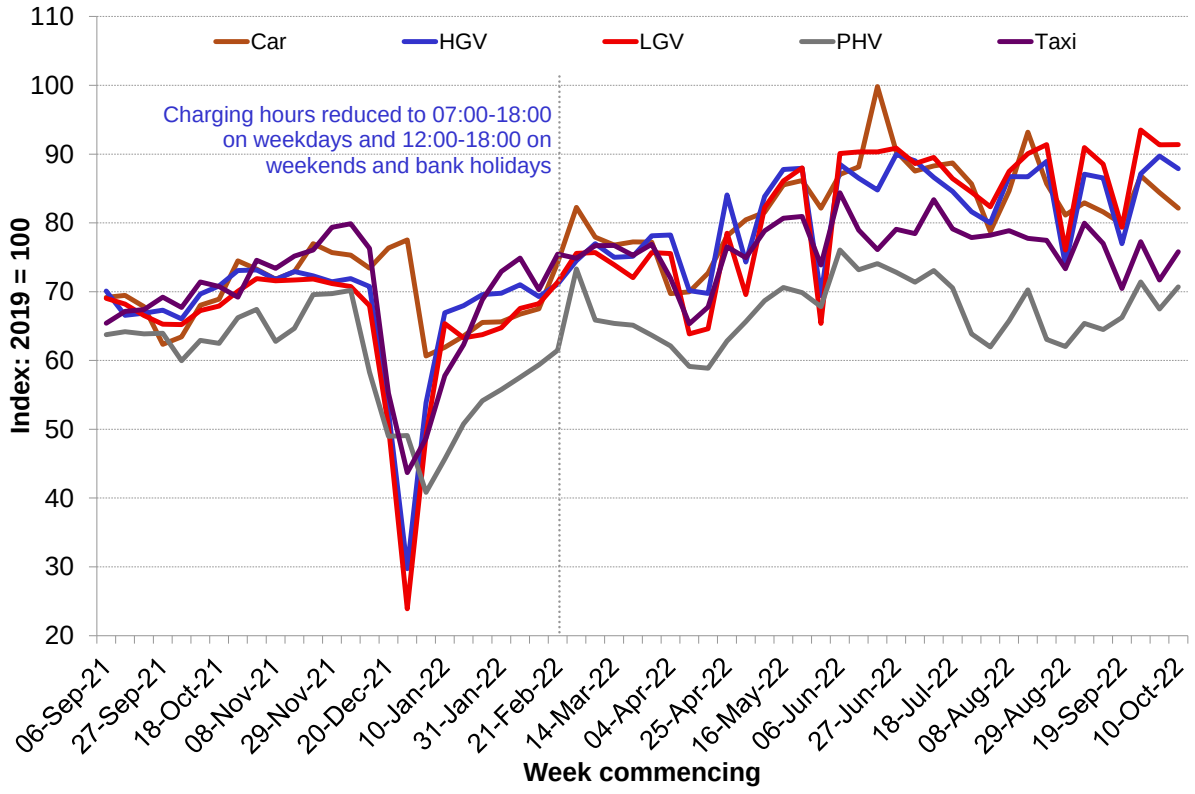
The initial impacts of the extension of the charging hours on weekdays and the implementation of charging on weekends was described in Travel in London report 14. Further changes to the scheme were implemented on 21 February 2022, and these included a reduction in the hours of operation of the charge from the temporary hours of 07:00 to 22:00 each day, to between 07:00 and 18:00 Monday to Friday and 12:00 to 18:00 at weekends and on bank holidays.

It is important to note that changes to the scheme were implemented alongside changes to travel demand reflecting the latter stages of pandemic restrictions and London's subsequent recovery. Additionally, a range of further external events during 2022 will have affected travel to and from central London.

Traffic in the central London Congestion Charge zone

At the start of September 2021, average weekly entries to the Congestion Charge zone ranged between 60 and 70 per cent of pre-pandemic levels for all vehicle types (figure 13).

Figure 13 Change in weekly entries (camera captures) to the Congestion Charge zone, by mode, Sep 2021-Oct 2022 vs 2019.



Source: TfL traffic data.

Entries for cars and freight vehicles were around 70 per cent of pre-pandemic levels, with the return of licensed taxis and PHVs slightly lower at 65 per cent and 64 per cent respectively. Vehicle entries were then affected by the Omicron wave into early 2022.

In the week that changes to operational hours were implemented (week commencing 21 February 2022), car entries increased by 10 per cent week-on-week. There was also a small increase in freight vehicles, of three per cent and five per cent for HGVs and LGVs respectively. In the week commencing 28 February there was a spike in car and PHV entries due to London Underground industrial action on 1 and 3 March.

Entries for all vehicle types returned through May 2022, in line with the more general resumption of activity. However, by September 2022 freight vehicle entries remained at a similar level to June 2022, while entries for cars, taxis and PHVs had declined slightly.

At the start of October 2022, average weekly LGV entries had returned to the greatest extent (91 per cent of 2019, pre-pandemic levels), followed by HGVs (88 per cent) and cars (82 per cent).

The return of taxis and PHVs has been slower. At the start of October 2022 licensed taxi entries were 76 per cent of the pre-pandemic levels, and PHVs entries were 71 per cent of the pre-pandemic levels.

It is important to consider road traffic trends seen in central London over the last year in the wider context of the pandemic recovery, as well as many days of industrial action on rail, during the period of analysis. Reflecting on the changes to the scheme over this period, the impact of the introduction of weekend charging on the return of car traffic is most notable. Looking at the later part of 2022:

- Car entries to the charging zone on weekends remain well below pre-pandemic levels. This is likely as a result of the charge currently operating between 12:00 and 18:00 when a charge did not operate prior to the pandemic. Car entries during this period are 61 per cent of 2019 levels, compared to 70 per cent across the day.
- Weekend car entries to the charging zone increased by 21 per cent on the weekend that the charging hours were shortened, and by 42 per cent in the periods that were temporarily charged during the pandemic (07:00 to 12:00 and 18:00 to 22:00). Nonetheless, car entries during these times remain well below pre-pandemic levels, at 75 per cent in October 2022.
- Changes to traffic as a result of changes to the Congestion Charge are broadly in line with expectation, when also accounting for pandemic-related travel demand changes in central London.

Shared and micromobility in London

Innovative forms of mobility continue to develop, and TfL is monitoring these to understand the extent to which they could contribute to the Mayor's transport aims.

The **car club** fleet size in London was 3,582 vehicles in 2021. TfL has conducted a review of its policy on car clubs to set out how it will work with car clubs to take the Mayor's policy forward and help deliver the benefits of reduced car ownership.

The result of this review is a set of commitments that TfL, working closely with London Councils, the boroughs, car club operators and the wider sector will take forward. In summary, these commitments are:

- To work with London Councils, the boroughs and the industry to encourage data sharing and visualisation to help inform strategic planning and policy development.
- To ensure that car clubs are included in policies and public messages that reference alternatives to car ownership, particularly when targeted at areas with high car ownership.
- To support operators and provide opportunities to promote third-party offers as part of scrappage schemes to individuals who want to reduce their private car use.
- To consider the role of car clubs in any potential future form of integrated road user charging.
- To support the electrification of car clubs through the rollout of electric vehicle charging in London and to work with operators to assess the needs of car clubs when implementing charging on TfL/Greater London Authority land.
- To provide quarterly updates setting out progress with these commitments.

London's **e-scooter trial** launched in June 2021 and has expanded significantly since then, with 10 boroughs, more than 500 designated parking locations and 4,425 e-scooters now involved.

In the first year of the trial, 1.8 million journeys were made across the three operators taking part in London's trial: Dott, Lime and TIER.

Safety is an important consideration, and the data so far shows that the rate of serious injuries arising from the trial has been falling as the trial matures.

Finally, TfL is keen to understand the potential of **cargo bikes** to support the Mayor’s aims for transport.

To help understand this potential, a study was recently conducted which showed that areas in central London have the highest potential for cycle freight, given that they also have the highest levels of employment, retail, cycling permeability and other supportive measures.

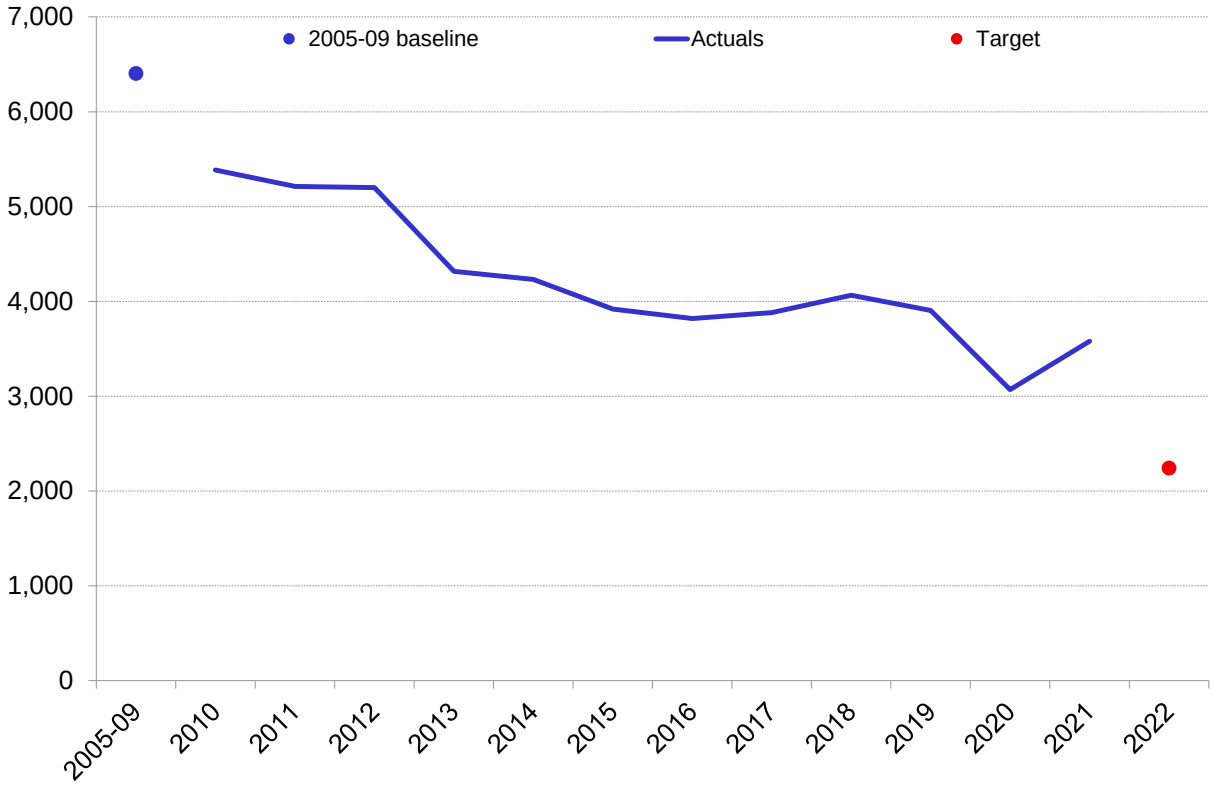
At present, cargo bikes make up less than one per cent of the cycle flows in London. However, current estimates suggest that, with the right measures, up to two per cent of van kilometres in London could be replaced with cargo bikes by 2025, with varying uptake rates by area (for example in central London it could be between three and nine per cent).

Road danger

The Mayor’s Vision Zero action plan makes it clear that no death or serious injury on London’s roads is acceptable or inevitable. It also sets targets of a 65 per cent reduction in people killed or seriously injured on London’s roads by 2022 and a 70 per cent reduction in people killed or seriously injured in or by a bus by 2022, ahead of eliminating all deaths and serious injuries by 2041.

- In 2021 there were 23,319 reported collisions in London, resulting in 75 people being tragically killed, 3,505 being seriously injured (3,580 killed or seriously injured) and 23,092 being slightly injured.
- 2021 saw the lowest number of road fatalities on record. There was a 22 per cent reduction in fatalities between 2020 and 2021, and a 44 per cent reduction in people killed or seriously injured from the 2005-09 baseline towards the target of a 65 per cent reduction by 2022. For children aged under 15 there was a 68 per cent reduction.
- 2021 was an unusual year with large changes in the composition of people killed or seriously injured. This was largely due to new travel patterns in the wake of the pandemic. Motorcycling and pedestrian fatalities were significantly lower by historic standards but cycling fatalities and serious injuries increased.
- For people killed or seriously injured in or by a bus we have achieved the Mayor's interim target for 2022 of a 71 per cent reduction from the 2005-09 baseline for the second year in a row, although in the context of the pandemic (figure 14).
- As pandemic disruptions recede, there may be an increased challenge in protecting vulnerable road users from motorised vehicles as more people choose to walk, motorcycle, cycle, and use e-scooters.

Figure 14 Progress towards the Mayor's Vision Zero target for killed or seriously injured casualties in road traffic collisions, 2005-09 baseline-2022.



Source: TfL Safety, Health and Environment.

Improving London's air quality and reducing our CO_2 emissions

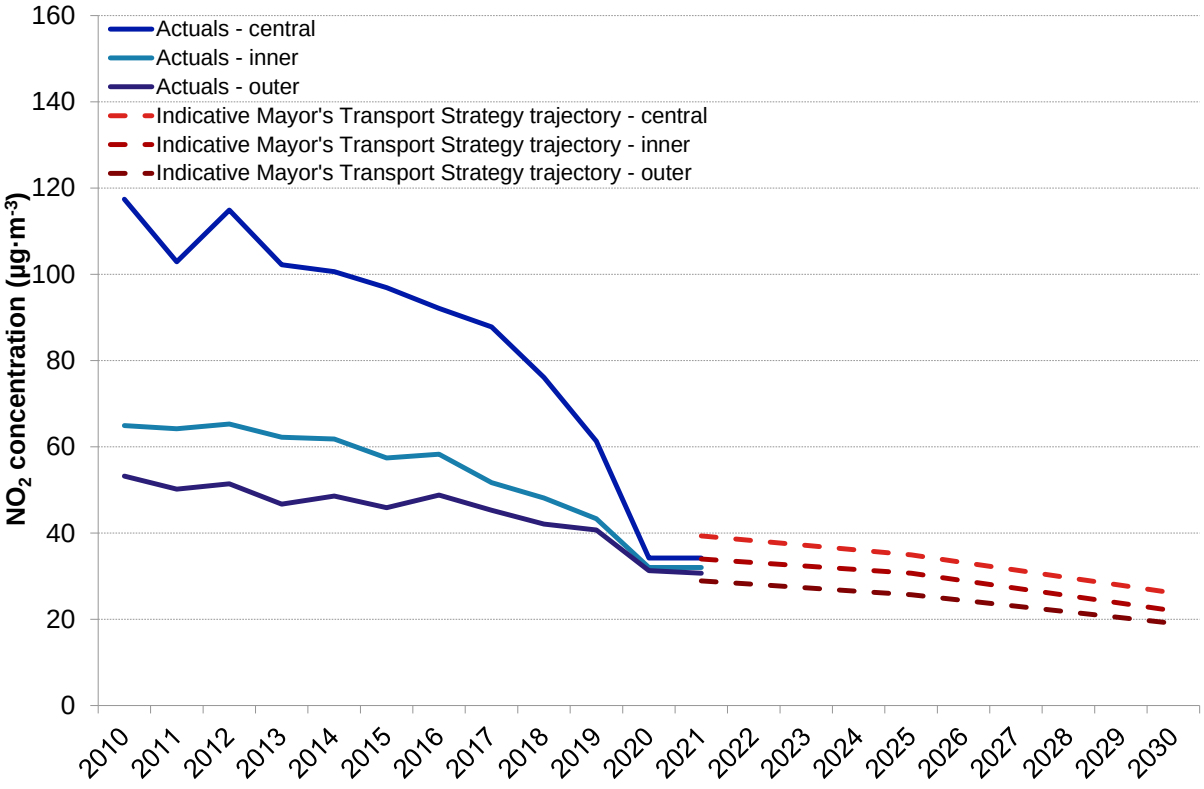
London's air quality remains a threat to the health of all Londoners, particularly some of the more vulnerable or otherwise disadvantaged.

Although significant improvements have been seen in recent years, following the general clean-up of the vehicle fleet, and encouraged by policies such as the Ultra Low Emission Zone (ULEZ), there is still much to do, particularly to continue to address levels of nitrogen dioxide (NO_2), especially alongside major roads that continue to exceed current UK legal limits (figure 15).

In 2021, the World Health Organization (WHO) released evidence showing and recommending the case for more stringent limits on a range of ambient air pollutants, including NO_2 (see the WHO global air quality guidelines on the WHO website).

These recommendations have yet to be formally adopted by the UK. Nonetheless, the latest WHO recommendations clearly make the case for continued action to address air pollution, from transport and all other sources, to further benefit the health of Londoners.

Figure 15 Average NO_2 concentrations in London by area, 2010-2030.



Source: London Air Quality Network.

Expansion of the Ultra Low Emission Zone to inner London

On 8 April 2019 the Mayor launched the world's first 24-hour Ultra Low Emission Zone (ULEZ) in central London. On 25 October 2021 the zone was expanded up to (but not including the North and South Circular Roads).

The ULEZ is now 18 times the size of the original area and covers four million people. The expanded ULEZ operates together with the established London-wide Low Emission Zone for large and heavy vehicles. The LEZ standards are now the same as the ULEZ standards for most large and heavy vehicles.

Six months on from the ULEZ expansion and over a year on from the enforcement of tighter LEZ standards these schemes are having a significant impact on the number

of older, more polluting vehicles driving in London and the levels of harmful pollution that Londoners are exposed to.

In spring 2022, nearly 94 per cent of vehicles seen driving on an average day in the expanded zone met the strict ULEZ standards, up from 87 per cent in the weeks immediately before the zone expanded and up from 39 per cent in 2017 when impacts associated with the ULEZ began. The compliance rate on boundary roads was 90 per cent and the compliance rate in outer London was 85 per cent, demonstrating the wider benefits as cleaner vehicles also operate outside the zone.

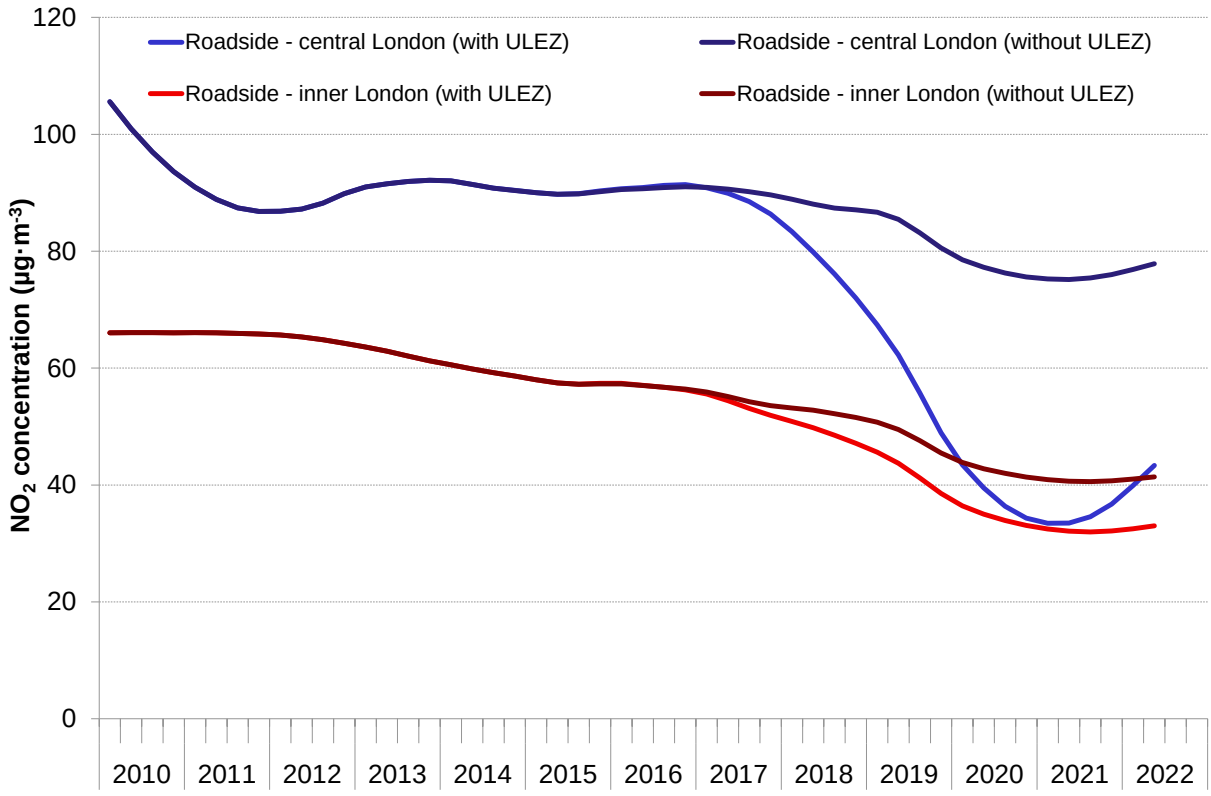
Initial analysis undertaken six months after the introduction of the expanded zone demonstrates that the ULEZ, LEZ and other policies have had a transformative impact on reducing NO_2 levels in this area.

In April-June 2022, the most recent data available, the mean roadside NO_2 concentrations measured in central London were 35µg·m^{-3} lower than the estimated (equivalent) 'without ULEZ' scenario, a difference of 44 per cent.

In inner London, roadside NO_2 concentrations were 8µg·m^{-3} lower than the estimated 'without ULEZ' scenario, a difference of 20 per cent. Crucially, the air quality improvements in inner London are being seen over an area that is 18 times the size of the original central zone, improving air quality directly for the four million people living in this area and those who come into the area for work, study or leisure.

Figure 16 also shows the importance of 'pre-compliance', that is, improvements in air quality as vehicle owners prepared for the introduction of the ULEZ in 2019 and its expansion in 2021.

Figure 16 Average NO_2 concentrations in London by quarter, with and without ULEZ, 2010-2022.



Source: London Air Quality Network.

The air is also cleaner on the boundary. All monitoring sites on the boundary of the expanded zone have seen reductions in NO_2 concentrations, with an estimated 17 to 24 per cent reduction in pollution on the boundary compared to a scenario without the ULEZ, reflecting the general improvement to emissions of vehicles travelling to or from the expanded zone.

Air quality, health and inequality

The reduction in nitrogen oxides (NO_x) emissions from road transport has not happened equally across London. Road transport NO_x emissions in inner London halved between 2013 and 2019. Comparatively, outer London NO_x emissions from road transport fell only by 31 per cent over the same period, and in 2019 accounted for 28 per cent of London's total NO_x emissions.

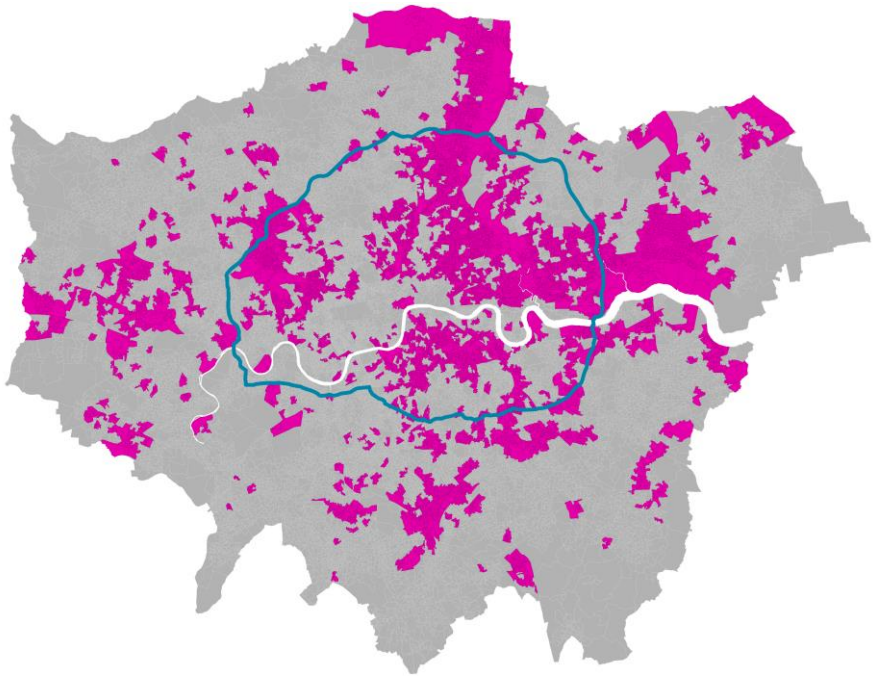
Similarly, fine particulate matter ($PM_{2.5}$) emissions from road transport fell by almost a quarter in inner London between 2016 and 2019, while in outer London they fell by seven per cent.

As a result, outer London now accounts for an increasing proportion of NO_x and $PM_{2.5}$ emissions from road transport and more needs to be done to ensure improvements in air quality are felt by all Londoners.

The differential impacts of poor air quality on London's deprived communities have been previously documented, and this analysis has been extended by TfL to take account of the interim WHO recommendations.

Considering the 30 per cent most deprived Lower layer Super Output Areas and their intersection with NO_2 concentrations above the interim WHO guideline, figure 17 shows their distribution across London. The shaded area accounts for 36.6 per cent of the 2011 London population (2.9 million people).

Figure 17 Spatial distribution of the 30 per cent most deprived areas with the highest NO_2 concentrations.



Source: TfL City Planning/Greater London Authority.
Note: The boundary of the expanded Ultra Low Emission Zone (ULEZ) is overlaid on the graph for reference.

Towards net-zero carbon by 2030

The Mayor's Transport Strategy set a target for London to be a zero carbon city by 2050. However, the Mayor has recently stated his ambition for London to be net-zero carbon by 2030, recognising the urgency of the climate change emergency.

Addressing carbon dioxide emissions generated by road transport will be central to meeting the 2030 net-zero target, as road transport is the second largest contributor to London's carbon dioxide emissions.

The Mayor's preferred option by which he envisions achieving his net-zero target (the Accelerated Green scenario) would require a 27 per cent reduction in car vehicle kilometres across London.

Recent initiatives to reduce road transport carbon dioxide emissions have included:

- The introduction of the ULEZ in central London in April 2019, which resulted in an estimated six per cent reduction in CO_2 emissions in the central zone.
- The recent expansion of the ULEZ to inner London, estimated to reduce CO_2 emissions London-wide by 4.6 per cent; the equivalent of taking 60,000 cars off the roads.
- London has western Europe's largest fleet of zero-emission buses, currently 866, alongside strict taxi and private hire licensing regulations for vehicle emissions, with 6,152 zero-emission-capable taxis registered in London as of October 2022.

Analysis of London's road transport carbon dioxide emissions data shows that:

- Cars and freight vehicles generate the greatest proportion of road transport carbon dioxide emissions, although freight vehicles are more polluting per mile and emissions from LGVs and HGVs have not been falling at the same rate as for other vehicle types.
- Outer London generates the highest proportion of carbon dioxide emissions from road transport. However, when accounting for size, central and inner London, as well as the strategic radial routes, generate a disproportionate amount of carbon dioxide emissions.
- Reductions in road transport carbon dioxide emissions since 2016 have been greater in central and inner London, with most boroughs reducing emissions by more than 10 per cent. In outer London, however, the picture is mixed with some boroughs (Bexley and Havering) seeing increases of more than five per cent over the same period (figure 18).
- Both a reduction in vehicle kilometres and an acceleration of the transition towards cleaner vehicles will be needed to significantly reduce the contribution of road transport to London's carbon dioxide emissions and minimise the proportion of emissions which require offsetting.

Supporting the transition to electric vehicles

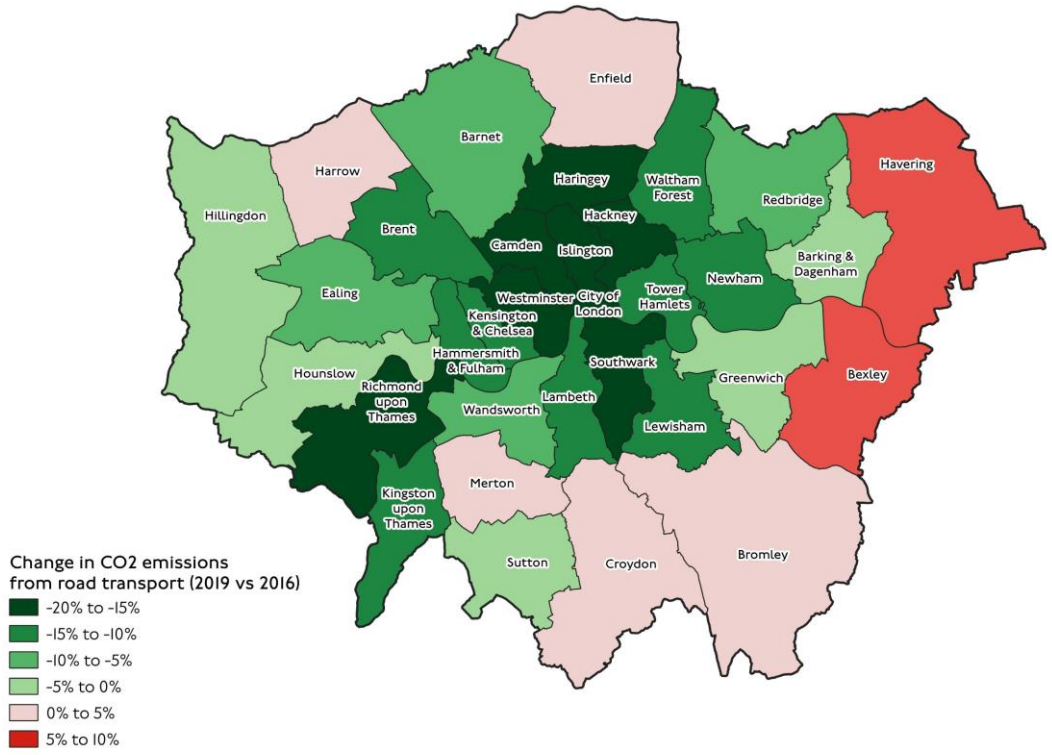
As more fully electric cars come into the market with larger batteries and longer ranges to meet consumer demand for zero-emission vehicles, the number of new battery-electric vehicle (BEV) registrations has started to overtake the number of new plug-in hybrid electric vehicle (PHEV) registrations.

Data from the Department for Transport indicates that first-time-registered plug-in electric vehicles (both BEV and PHEV) hit a record high in London with 28,000

vehicles registered new in 2021, representing 20 per cent (one in five) of all newly registered cars, motorcycles and light goods vehicles; the trend continuing with a further 16,000 plug-in electric vehicles registered in the first half of 2022. This suggests that Londoners are beginning to choose plug-in electric vehicles in larger numbers over traditional internal combustion engine vehicles.

Delivery and utilisation of charge points in London continues to build, with more than 11,200 publicly accessible charging units available, of which 820 are rapid chargers. In summer 2022, some 70 per cent of chargers saw five or more charging events on an average day.

Figure 18 Change in road transport CO_2 emissions by borough, 2019 vs 2016.



Source: London Atmospheric Emissions Inventory.

A good public transport experience

Long-term trends in public transport demand

Aggregate public transport demand in London has grown strongly over the last couple of decades as a reflection of the economic growth of the Capital as well as the progressive enhancements to service capacity, connectivity and reliability.

For example, between 2009/10 and 2019/20, the number of journeys on the principal public transport modes increased by 11 per cent and the number of kilometres travelled by 26 per cent, significantly contributing to the historic shift to active, efficient and sustainable modes.

More recently, changes to key factors such as population, economic growth and disposable incomes led to a slowdown in growth since the mid-2010s and the coronavirus pandemic had a devastating impact on public transport demand from

March 2020, leading to record lows of patronage and a long and volatile recovery affected by rapidly changing restrictions to economic activity and travel.

Since the last of these restrictions were lifted, public transport demand has entered a period of sustained recovery. Although this is not yet complete, and there is evidence of some pandemic adaptations persisting into the recovery period, the status of the public transport recovery in late autumn 2022 can be regarded as encouraging.

Service provision and operational performance

As both a consequence and enabler of London's growth, public transport service capacity, connectivity and the wider customer experience (reliability, physical accessibility and so on) have been continually improved over the last couple of decades.

For example, between 2009/10 and 2019/20 (before the coronavirus pandemic), the total capacity provided by the main public transport networks in London increased by some 28 per cent. This excludes more recent improvements such as the new Elizabeth line inaugurated in May 2022 (which once fully operational will by itself add a further 10 per cent to central London's rail network capacity) or the more recent London Overground extension to Barking Riverside, which opened in July 2022.

In terms of operational performance, the last few years have been characterised by maintaining a very high standard of operational performance even through the challenges of increased demand as well as those arising more recently from the coronavirus pandemic.

Public transport customer safety

With fewer customers travelling due to the pandemic, there was a corresponding fall in the number of customer and workforce injuries on our public transport network.

In 2021/22 there were 6,957 injuries of all severities across our public transport network. This compares to 3,389 injuries during 2020/21, which was severely affected by pandemic restrictions. It also compares to representative pre-pandemic figures of more than 9,000 such injuries per year.

A rate-based examination suggests, however, that there may be some adverse trends emerging as we recover from the pandemic and as people return to public transport. The customer injury rate has increased substantially this year, up by seven per cent, compared to 2017/18.

This is a worrying trend and suggests that some customer behaviours seen during the pandemic, such as not wanting to hold on to handrails, may be persisting, despite our much-publicised cleaning efforts.

TfL will be looking at this closely over the coming year, making sure to evolve our customer marketing campaigns accordingly and to provide advice on travelling safely.

Public transport customer satisfaction and Care

Care and customer satisfaction are our primary measures for understanding the quality of the customer experience that TfL delivers, from a customer perspective.

They are complementary elements in determining how TfL is working for our customers, providing a rounded picture of our performance.

'TfL cares about its customers' is the measure used to understand whether TfL is meeting expectations and making Every Journey Matter for our customers.

Care measures Londoners' overall perceptions of TfL and is the best reflection of how TfL meets expectations in every interaction with customers (for example all journeys, interactions with the Contact Centre and communications such as email updates), not just the last journey. A continuing focus on Care helps TfL understand, in the short term, how TfL works for our customers, and in the longer term, how to encourage greater use of active, efficient and sustainable modes.

Our key Care measure has maintained an encouraging trend throughout the pandemic, with quarterly results lying in the range of 55 to 60 per cent of our customers agreeing that 'TfL cares about its customers'. The stability of this measure throughout the pandemic, and at higher values than were typical before, is particularly notable.

Public transport fares

The average yield per passenger journey for all modes was £1.20 in 2021/22, an increase of 3.2 per cent compared with 2017/18. The average fare paid on public transport differs across all modes.

London Underground has the highest yield, at just more than £2.00 per journey. This has increased slightly from £1.98 in 2017/18 to £2.02 in 2021/22, although the latest two years of data are affected by changes in travel patterns due to the pandemic.

In contrast, the lowest yield is on buses, at 74 pence per journey. The impact of concessionary fares means that the income per journey is lower than the average fare per mode.

Physical accessibility of the public transport networks

Making travel more accessible and inclusive for all is one of our top priorities. TfL measures progress against this aim by comparing, for all possible journeys using London's public transport network, the relative additional journey time that would be incurred on average when using only the step-free network against the time required if the whole network was available.

In 2021/22, Nine Elms and Battersea Power Station opened with step-free access as part of the Northern Line Extension; and eight other London Underground stations were made step free. Currently 92 of the 272 London Underground stations are step free. Beyond this, TfL has continued to make stations across our rail network more accessible, with half of the stations now step free.

The opening of the Elizabeth line provides 41 step-free stations from Reading and Heathrow in the west to Shenfield and Abbey Wood in the east. While some of these have been put in place over recent years on existing National Rail networks, the opening of the central section to direct services through central London from late 2022 will help to make the heart of the West End accessible and inclusive for more Londoners than ever before.

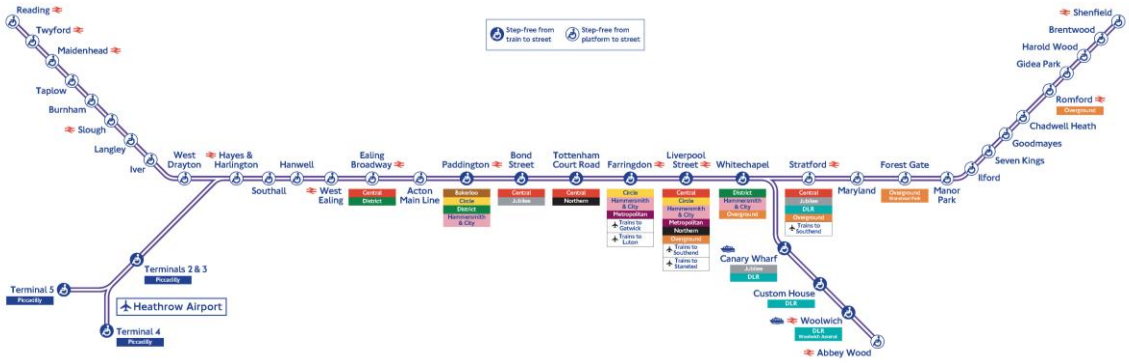
All these recent improvements to the step-free network will translate to a reduction of about 32 per cent (from 9.5 minutes in 2016/17 to 6.4 minutes in 2022/23) in the average journey time difference using the step-free network compared to the rest of the network. This is in addition to the transformational changes in journey times across London brought about by the Elizabeth line.

Supporting New Homes and Jobs: new transport infrastructure for London

Opening of the central section of the Elizabeth line

The central section of the Elizabeth line opened successfully on 24 May 2022. This was a key stage in the realisation of the full Crossrail project, which is transforming journey opportunities to, from and within central London and has facilitated the delivery of 54,725 new homes within one kilometre of its stations between 2008 and 2021.

Figure 19 The Elizabeth line.



Source: TfL.

After five months of operation, it is already clear that the central section is delivering the expected benefits and that Londoners are taking full advantage of the new journey opportunities it offers.

Delivery of the full interconnected railway is expected to be achieved no later than May 2023.

- Between 24 May and 20 October there were around 60 million passenger journeys using the whole Elizabeth line, of which around 30 million used the central section.
- A typical weekday (Tuesday-Thursday) now sees more than half a million passenger journeys on the whole line, and a quarter of a million on the central section.
- Demand is broadly in line with expectations, and at current rates in line with expectations in the business case of between 130 and 170 million passenger journeys a year by 2025/26. Current demand is also well within the capacity provided.
- Journey times have been transformed. A journey between Liverpool Street and Paddington that took 24 minutes before the opening now takes as little as 18 minutes; and a journey between Paddington and Tottenham Court Road

previously took 21 minutes now takes as little as 11 minutes. Demand has also increased where there have been improvements in journey times.
- Connectivity, especially in southeast London, has also dramatically improved. There are 1.4 million more jobs across London and the South East now accessible within 60 minutes of Abbey Wood than before the central section of the Elizabeth line opened.
- The full impacts of the new railway on patronage on other rail lines will become apparent as the project reaches completion. So far, an estimated 39 per cent of total passenger kilometres on the line come from other London Underground lines and a further 14 per cent from the DLR.
- However, there are also early indications of the potential of the new line to generate new rail trips. Rail demand from stations in the Canary Wharf area has grown by 25 per cent, and in the Woolwich area by 20 per cent, well above background growth. There is also a large increase in usage at Tottenham Court Road station that is not being offset with (rail) reductions elsewhere, suggesting generation of new demand.

An extensive programme of monitoring and evaluation of the project has been put in place by TfL and the Department for Transport, as joint sponsors for the line. This will ensure that the full benefits of the new railway are understood and reported in future years.

Northern Line Extension

Travel in London report 14 introduced the recently opened Northern Line Extension as an example of Good Growth and of the role of transport infrastructure in enabling development of more than 20,000 new homes and around 25,000 jobs in the Vauxhall Nine Elms Battersea Opportunity Area.

After a full year of operation, and in the context of continuing development at the site, the latest data shows that typically some 90,000 passengers enter the stations on the extension every week. Battersea Power Station is the busier station, with some 50,000-55,000 passengers per week as of late September 2022, while Nine Elms sees some 35,000 entries per week.

As the many developments in this Opportunity Area progressively reach completion, it is expected that demand will continue to grow, as has been seen recently with the opening of the new Battersea Power Station development (which includes residential units, offices, retail and leisure space) in October 2022.

London Overground extension to Barking Riverside

The Barking Riverside Extension is a four-kilometre extension of the Overground Gospel Oak – Barking line and is the first extension to the London Overground since 2015.

A new step-free station at Barking Riverside was opened in July 2022, providing a new rail link between Barking Riverside and Barking town centre as well as a step-free entry point to other London Underground, London Overground and National Rail services, reducing travel time by more than 15 minutes.

Together with the developer Barking Riverside Limited, TfL is continuing work on the public areas around the station until 2023. These will form the district centre at the heart of the Barking Riverside development.

The opening of the new station unlocks the full development potential of the largest housing development in east London. The masterplan for the site includes 10,800 new homes (half of which will be affordable), a new school, healthcare, shopping, community and leisure facilities, high-quality public spaces and connections to walking and cycling routes.

If public transport did not cater for demand, many trips would be dependent on private car use. Improvements have been made to bus services but this on its own would be unable to accommodate the level of passenger demand generated by 10,800 homes.

Coupled with planning conditions to ensure that public transport and housing are coordinated and delivered sustainably, no more than 4,000 homes could be occupied without the delivery of the new London Overground link. Therefore, the extension has unlocked 6,800 homes in dependent development, helping to meet strategic housing targets for London and to accommodate future population growth.

The Barking Riverside Extension is therefore a catalyst enabling the full build-out of Barking Riverside and currently attracts more than 11,000 trips each week.

The Silvertown Tunnel

The Silvertown Tunnel will be a 1.4km twin-bore road crossing of the Thames, linking Silvertown in Newham with the Greenwich Peninsula. It is due to open in 2025 and construction is now well underway.

This modern tunnel combined with a user charge and improved cross-river bus network will improve public transport connectivity and the reliability and resilience of the wider road network, in particular relieving pressure on the Blackwall Tunnel.

The tunnel is part of a wider package of improvements, including for walking and cycling, in the areas near the tunnel entrances as part of major regeneration of both sides of the river.

Chapter 10 of this report describes the extensive baseline monitoring that is being put in place to ensure that the impacts of the tunnel can be properly understood, and to allow for any unforeseen impacts to be detected and mitigated. This monitoring covers a wide range of factors related to the usage and operation of the local road network, air quality, and wider changes to the social and economic conditions in the vicinity of the new tunnel.

Supporting New Homes and Jobs: London's Opportunity Areas

Context and monitoring

Opportunity Areas are designated through the London Plan as areas with particular development potential. They have an important role in delivering the 66,000 extra homes per year that London needs.

TfL works closely with the Greater London Authority, London boroughs and other key stakeholders to ensure that Opportunity Areas are delivered in line with the transport principles of Good Growth. Central to this is the requirement to support sustainable and active travel and to avoid car-dependent development.

The delivery of homes, jobs and infrastructure in Opportunity Areas should be monitored and action should be taken where necessary to overcome any barriers. TfL monitoring work in Opportunity Areas seeks to understand the extent to which the Mayor's principles of Good Growth are being realised on the ground.

Opportunity Areas and increased public transport access

Accessibility to public transport is an important measure of Good Growth. The more connected people are to the public transport network, the more likely they are to choose public transport over car travel.

Traditionally TfL has measured access to public transport using the Public Transport Access Level (PTAL) metric. However, in our monitoring work this is taken a step further by combining PTAL and population data to report on the proportion of the Opportunity Area's population that falls within low/medium/high PTAL categories.

The Mayor's aim is to increase the proportion of people living in areas with high PTAL within Opportunity Areas to 56 per cent by 2030.

The 2004, 2008 and 2011 Opportunity Area cohorts have all seen an increase in the proportion of their respective populations that live in high PTAL areas, and a decrease in the proportion of their populations that live in low PTAL areas between the Opportunity Area designation year and 2022. However, the 2016 cohort (Canada Water and Harrow and Wealdstone) have seen a decrease in the proportion of their population that live in high PTAL areas.

For comparison, since 2005 the proportion of London's population living in high PTAL areas has increased from 26 per cent to 33 per cent, while the proportion of London's population living in low PTAL areas has reduced from 27 per cent to 19 per cent.

These figures indicate that TfL is making good progress in its spatial planning work towards increasing the PTAL of London's population. However, a more detailed consideration of the data shows that between 2020 and 2022 there has been a slight reversal in the progress being achieved against this metric, which is related to public transport changes during the pandemic. TfL will continue to monitor this situation over future years.

People choose to walk and cycle in Opportunity Areas

There is a clear upward trend in proportion of walking trips in both the Opportunity Area sample and the Greater London sample: across a three-year period between 2017/18 and 2019/20 walking trips in Opportunity Areas rose from 26 per cent to 31 per cent, while across Greater London the rise was from 30 per cent to 35 per cent.

Opportunity Areas are designed with the principles of Good Growth in mind which help to achieve this, for example by using transport to support and direct growth and by creating high-density, mixed-use places where people can walk and cycle to local amenities and use public transport for longer trips.

Housing delivery in Opportunity Areas

The capacity for delivery of new housing is a key defining feature of an Opportunity Area. Typically, Opportunity Areas present opportunities for high-density sustainable development on brownfield sites.

A total of 28,284 homes have been delivered in adopted Opportunity Areas over a two-year period (April 2019-March 2021), which represents nine per cent of the London Plan target for the adopted Opportunity Areas over the 2019-2041 period.

Four of the Opportunity Areas received more than 3,000 completed homes between April 2019 and March 2021. These are: Olympic Legacy (3,329), Upper Lee Valley (3,170), City Fringe/Tech City (3,550) and Wembley (3,903). The Opportunity Area with the highest number of affordable homes delivered over the two years was Wembley with 919 affordable homes, followed by the Olympic Legacy Opportunity Area with 722 affordable homes.

Housing on TfL Land

TfL's ambitious housing programme continues to progress. Construction is underway on some 1,700 homes on nine sites across London and TfL is on track to start work on more than 2,500 new homes this financial year. Construction is nearly complete on 350 homes at Blackhorse View (Waltham Forest), and the tallest building on its 619-home Kidbrooke site (Greenwich) topped out in summer 2022.

In 2021/22, 467 homes were started across three sites: Wembley Park (454 homes), Aylesbury Street (nine homes) and Albany Road (four homes), and nine homes were completed at Bond Street Oversite Development.

Rising construction costs and inflation are impacting the wider industry and TfL and its partners are working through what this means for their projects. TfL is also aware of the wider capacity issues with the electricity grid in west London. This could potentially delay some schemes, including 460 homes at Southall (Ealing). TfL is working closely with its partner Grainger as part of the joint venture, Connected Living London, to mitigate the grid capacity issues and is working on a temporary supply which could still allow construction to start this financial year.

Monitoring the legacy of the London 2012 Olympic and Paralympic Games

It is now 10 years since the London 2012 Olympic and Paralympic Games.

Although acknowledged to have been highly successful as an event, it is timely to examine the extent to which transport-related legacy expectations are being met.

Baselines for some of these indicators were set out in Travel in London report 6. In view of the complications to gathering data and assessing trends brought about by the pandemic TfL will continue gathering travel data over the next year, from which a fuller 10-years-on assessment will be possible. In the interim, it is possible to update on development in the Olympic Legacy Opportunity Area.

Development in the Olympic Legacy Opportunity Area

The Olympic Legacy Supplementary Planning Guidance (SPG) 2012 set out a vision for making the Queen Elizabeth Olympic Park and its surrounding areas 'a distinctive and well-connected place where people can live and work sustainably and [which will] offer a wide range of new jobs and homes'.

Since the decision in 2005 to award the 2012 Olympic and Paralympic Games to London, there has been significant investment in public transport and other infrastructure to support the continued regeneration of east London:

- **2006**: Lifts providing step-free access to high-level platforms at Stratford station brought into service.
- **2007**: TfL took over the North London line (formerly Silverlink), then terminating at Stratford. This was the start of the London Overground.
- **2007**: New DLR platform opened at Stratford station.
- **2009**: High-speed commuter services started operation from Stratford International station.
- **2010**: New platform 3a for westbound Central line trains opened in advance of the London 2012 Olympic and Paralympic Games.
- **2011**: New mezzanine ticket hall along with extra staircases and lifts opened in advance of the London 2012 Olympic and Paralympic Games.
- **2011**: DLR extension to Stratford International opened, including new DLR stations at Stratford High Street and Abbey Road and making use of previous North London line platforms at Stratford station.
- **2011**: Stratford City bus station opened.
- **2011**: New ticket hall opened with the Westfield Stratford City shopping centre.
- **2013**: Improved frequencies on the Central and Jubilee lines.
- **2018**: Improvement works at Hackney Wick station completed, improving the connectivity through the area as well as the station capacity.
- **2022**: Elizabeth line services started serving Stratford and Maryland stations, allowing people to travel from Stratford to Paddington in just 19 minutes.

These and several more local transport developments in Stratford town centre have significantly improved connectivity, as reflected in the proportion of the population that live in areas with high PTAL. This has increased from around one third of the population in 2005 to around one half of the population in 2020, which represents strong progress towards the Mayor's aim of 56 per cent of the population of Opportunity Areas living in high PTAL areas by 2030.

The Olympic Legacy SPG identified the capacity for 32,000 homes in and around the Queen Elizabeth Olympic Park in the 20-year period after the London 2012 Olympic and Paralympic Games. Some 15,500 homes have been delivered in the Opportunity Area, and London is currently on track to achieve this target.

Job creation underpinned by sustainable and active travel connectivity has always been central to the London 2012 Olympic and Paralympic Games legacy vision for the Queen Elizabeth Olympic Park area.

The Mayor's London Plan identifies the Olympic Legacy Opportunity Area as having potential for 65,000 new jobs by 2041. This employment vision is well underway.

On the Stratford station side (eastern side) of the park is the International Quarter London, which hosts the Financial Conduct Authority, Transport for London, UNICEF, Cancer Research UK, the Nursing and Midwifery Council, The Insolvency Service, the British Council and shared workspace facilities.

On the northwestern side of the park, by Hackney Wick station, lies the thriving innovation campus of Here East. Employers at Here East include Loughborough University London, University College London, Staffordshire University and BT Sport.

1. Introduction and contents

1.1 TfL's Travel in London reports

Travel in London is TfL's annual publication that summarises trends and developments relating to travel and transport in London. Its principal function is to describe how travel is changing and to provide an interpretative overview of progress towards implementing the Mayor's Transport Strategy. It also provides an evidence and analysis base for the general use of stakeholders and policymakers.

This fifteenth report covers trends and developments up to 2021 and into 2022, including historical series and, more recently, reflecting the disruption brought about by the coronavirus pandemic from early 2020 and London's subsequent recovery.

The report is broadly structured around the Mayor of London's key aims for transport in London, providing interpretative feedback about progress towards these aims.

As well as describing overall travel trends, such as patterns of travel demand and mode shares, the report provides insight into topics and developments of contemporary concern. For example, this year, the initial impacts of the opening of the central section of the Elizabeth line from May 2022.

For more information about any of the items featured in this report, please contact TILEnquiries@tfl.gov.uk.

1.2 The Mayor's Transport Strategy

The Mayor's Transport Strategy, published in March 2018, outlines the Mayor's vision for transport in London. The overarching aim of the transport strategy is to reduce Londoners' dependency on cars and to increase the active, efficient and sustainable (walking, cycling and public transport) mode share of trips in London to an ambitious 80 per cent by 2041.

In addition to the overarching mode share aim, the transport strategy is focused on achieving nine outcomes grouped under three broad themes:

Healthy Streets and healthy people

- London's streets will be healthy and more Londoners will travel actively
- London's streets will be safe and secure
- London's streets will be used more efficiently and have less traffic on them
- London's streets will be clean and green

A good public transport experience

- The public transport network will meet the needs of a growing London
- Public transport will be safe, affordable and accessible to all
- Journeys by public transport will be pleasant, fast and reliable

New homes and jobs

- Active, efficient and sustainable travel will be the best option in new developments
- Transport investment will unlock the delivery of new homes and jobs

Travel in London report 14 introduced a quantitative framework for tracking progress against these aims, and this framework is reflected in this report.

Related strategies such as the Mayor's London Environment Strategy and the London Plan also have significant implications for transport in the Capital, and aspects relevant to those strategies are also covered.

1.3 About Transport for London (TfL)

Part of the Greater London Authority family led by Mayor of London Sadiq Khan, we are the integrated transport authority responsible for delivering the Mayor's aims for transport. We have a key role in shaping what life is like in London, helping to realise the Mayor's vision for a 'City for All Londoners' and helping to create a safer, fairer, greener, healthier and more prosperous city.

The Mayor's Transport Strategy sets a target for 80 per cent of all journeys to be made by walking, cycling or using public transport by 2041. To make this a reality, we prioritise sustainability, health and the quality of people's experience in everything we do.

We run most of London's public transport services, including London Underground, London Buses, the DLR, London Overground, Elizabeth line, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the IFS Cloud Cable Car. The experience, reliability and accessibility of these services is fundamental to Londoners' quality of life.

We manage the city's red route strategic roads and, through collaboration with the London boroughs, we are helping to shape the character of all London's streets.

These are the places where Londoners travel, work, shop and socialise. Making them places for people to walk, cycle and spend time will reduce car dependency, improve air quality, revitalise town centres, boost businesses and connect communities. As part of this, our expanded Ultra Low Emission Zone scheme and fleet of increasingly environmentally friendly and zero-emission buses are helping to tackle London's toxic air.

During the pandemic we took a huge range of measures to ensure people were safe while travelling. This included extensive cleaning regimes across the public transport network and working with London's boroughs to introduce the Streetspace for London programme, which provided wider pavements and cycle lanes for people to walk and cycle safely and maintain social distancing.

London's recovery is vital to the UK's recovery as life returns to normal. We want to ensure London avoids a car-led recovery and we continue to reassure people the Capital and our transport network is safe and ready for them.

We have constructed many of London's most significant infrastructure projects in recent years, using transport to unlock much needed economic growth. This includes

major projects like the extension of the Northern line to Battersea Power Station and Nine Elms in south London, as well as our work at Barking Riverside and the Bank station upgrade.

Working with the Government, we completed the Elizabeth line in time for Queen Elizabeth II's Platinum Jubilee. This transformational new railway adds 10 per cent to central London's rail capacity and supports the delivery of high-density, mixed-use developments, which are planned around active and sustainable travel to ensure London's growth is Good Growth. We also use our own land to provide thousands of new affordable homes and our own supply chain creates tens of thousands of jobs and apprenticeships across the country.

We are committed to being an employer that is fully representative of the community we serve, where everyone can realise their potential. Our aim is to be a fully inclusive employer, valuing and celebrating the diversity of our workforce to improve services for all Londoners.

We are constantly working to improve the city for everyone. This means using information, data and technology to make services intuitive and easy to use and doing all we can to make streets and transport services accessible to all. We reinvest every penny of our income to continually improve transport networks for the people who use them every day. None of this would be possible without the support of boroughs, communities and other partners who we work with to improve our services. By working together, we can create a better city as London's recovery from the pandemic continues.

Section 1: Overall travel demand and mode shares

2. Consolidated estimates of demand and mode shares

2.1 Introduction

This chapter summarises trends in total travel in London and the principal factors affecting this over the longer term, including during the pandemic and early transport recovery.

Although the pandemic had a major impact on total travel and mode shares during 2020 and 2021, the focus should now return to the longer-term context and the trajectory towards the Mayor's aim of an 80 per cent mode share for active, efficient and sustainable modes (walking, cycling and public transport) by 2041.

2.2 Travel demand trends on the principal networks during the pandemic and London's transport recovery

Travel demand and recovery trends on the main transport modes

Figure 2.1 shows the trajectory for aggregate travel demand on the main transport modes over the pandemic period, including the dramatic impacts of the early stages of the pandemic as well as the encouraging progress into the recovery through 2022.

By October 2022, representative average daily demand on the London Underground was at about 82 per cent of the pre-pandemic levels; bus demand was some 84 per cent and traffic on the TfL Road Network of major roads around 94 per cent of the pre-pandemic levels, although it had been close to this level since early 2021.The figure for all TfL-operated public transport modes was 85 per cent of the pre-pandemic baseline.

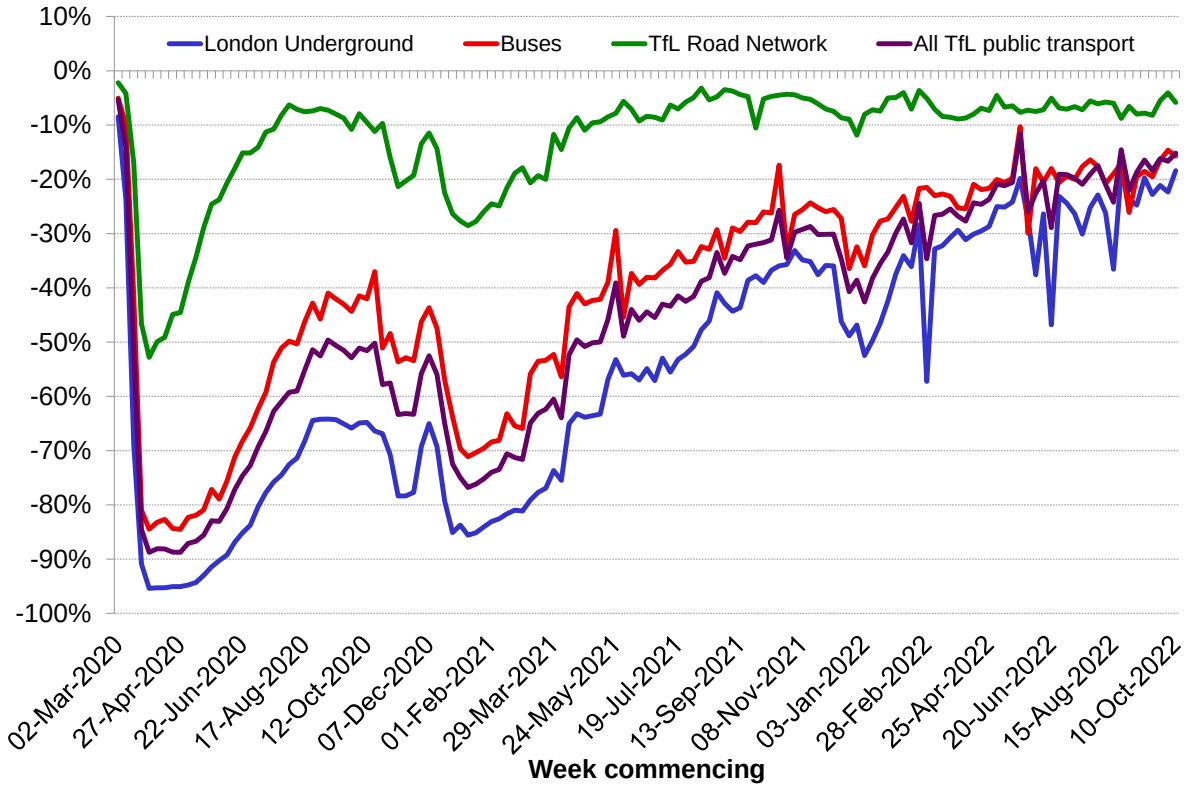
The broad relativities between the modes established during the pandemic seem to have persisted for most of the recovery so far, although recent values from autumn 2022 suggest a strong recovery on the London Underground that is closing the gap with buses and the overall public transport trend.

In interpreting the later 2022 months on figure 2.1, however, it should be noted that these have been marked by several external, non-pandemic events that have disrupted activity and travel patterns (such as industrial action, the state funeral of Queen Elizabeth II, and extreme weather events) and it is therefore not yet possible to discern clear trends that could be regarded as representing settled post-pandemic levels of demand.

Nevertheless, the persisting general upward trend for public transport, together with stable road traffic at slightly below pre-pandemic levels are notable. As yet there is no direct evidence of an immediate fuel price impact on London's major road traffic in 2022.

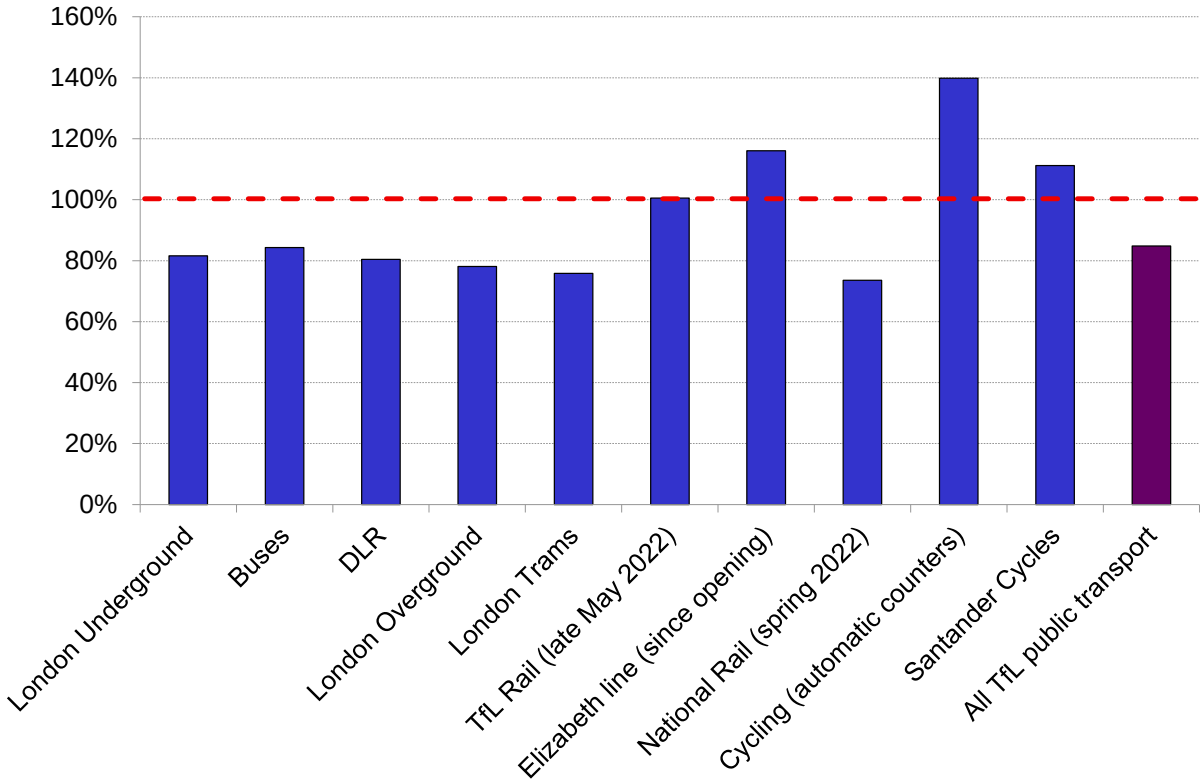
For comparison, figure 2.2 shows representative levels of demand on other transport modes as of autumn 2022 (where possible), relative to a pre-pandemic baseline.

Figure 2.1 Average weekly demand on the main transport networks compared to the equivalent week before the pandemic, Mar 2020-Oct 2022.



Source: TfL traffic and service performance data.
Notes: See figure 1 in the Overview.

Figure 2.2 Indicative average weekly demand on transport modes in London, autumn 2022 vs representative pre-pandemic baseline.



Source: TfL service performance data, TfL Cycle Hire and Office of Rail and Road.

In general, all public transport modes continue to show varying degrees of shortfall relative to the pre-pandemic demand, with the exception of cycling, where demand currently exceeds pre-pandemic levels, and TfL Rail and the Elizabeth line, where comparisons are complex due to the changes in services over the last few years culminating with the opening of the central section of the Elizabeth line in May 2022.

Looking at figure 2.2 in more detail:

- **DLR** and **London Overground** are typically seeing about 80 per cent of pre-pandemic demand, comparable to the position on the London Underground.
- **London Trams** recovery is slightly lower at just less than 80 per cent of pre-pandemic levels.
- The **TfL Rail/Elizabeth line** story is, however, more complex. Prior to the opening of the central section of the Elizabeth line with services running between Paddington and Abbey Wood in late May 2022, demand on TfL Rail services from Paddington and Liverpool Street was on a par with equivalent pre-pandemic dates, likely due to the continuous expansion of services over the last few years due to the ramp-up to the Elizabeth line opening.
- The **Elizabeth line itself**, as of October 2022, was also showing a net increase in demand (of 16 per cent), but this is compared to its first week of operation in late May 2022 and not to a pre-pandemic baseline. Further details about the initial impacts of the central section of the Elizabeth line are described in chapter 9.
- Patronage on **National Rail** services in the London area (London and South East franchised operators) is only updated every quarter, and as such figure 2.2 shows the latest available data from April-June 2022 (as opposed to the position in autumn 2022), which suggests that overall journeys on National Rail in London at that point were at around 74 per cent of the pre-pandemic levels, although noting that the impact of the prolonged industrial action was beginning to be felt.
- Finally, the latest indicative **cycling** trends from October 2022 from our limited sample of continuous automatic counters (mostly in central and inner London) show weekly demand at about 140 per cent of the pre-pandemic baseline, with **Santander Cycles** hires at around 111 per cent of the pre-pandemic level over the same period, thus maintaining the pattern seen during the pandemic of significant increases to pre-pandemic levels of cycling in London.

Features of pandemic travel demand persisting into the recovery

The above averages conceal important features of interest, many of which have been observed during the pandemic and are discussed in more detail throughout this report. The most significant for planning the next phases of the recovery are:

- **Relativities in demand and recovery between different modes**. A striking feature of the pandemic has been the uneven pace of recovery among different modes. While for instance major road traffic quickly bounced back to levels close to the pre-pandemic baseline, public transport has been slower to recover. And even among public transport modes there are differences between buses/trams and rail modes, the latter showing a slower recovery. These relativities have tended to persist even without formal restrictions, but there are signs that they may have started to narrow in the latter part of 2022.
- **Active travel** modes proved to be more resilient during the pandemic and the most recent data suggests that they have seen net gains since the pandemic. Both cycling and walking levels decreased less than other modes in relative

terms during the initial outbreaks (as they were more suited to prevailing conditions) and recovered more quickly, in some cases leading to unprecedented levels of demand much higher than before the pandemic, which in the longer run have translated into a modest but clear net step increase.

- **Changes in travel demand by day of the week**. Another persisting feature is the extent to which the pre-pandemic relativities among days of the week have changed, which differs among modes. While there do not seem to be any lasting changes in the distribution of road traffic or bus demand throughout the week, the opposite is true for rail modes (particularly London Underground), where recovery has been noticeably faster on weekends than on weekdays and where differences among the days of the traditional working week have been exacerbated. Currently, the central days (Tuesday to Thursday) are showing a relatively higher difference to Mondays and Fridays than they did before the pandemic, particularly during the morning peak period. Of particular interest is the difference on Fridays, which used to be the busiest weekday and are now one of the quietest. This is explored further in chapter 7 of this report.
- Something slightly different occurred for **cycling**, where weekend demand increased much more than weekday demand, which was dominated by commuting. This was particularly true at the height of the pandemic. However, weekday cycling demand was largely retained during the pandemic, even with much lower commuting, and the weekend gains (typically up by around 90 per cent) have been retained in the recovery phase. Among the various days of the working week, the differences in cycling demand have been exacerbated, in line with the trend for public transport.

In interpreting the above, it should be noted that the pandemic also affected many aspects of trip making in London, such as time of day, travel distance and journey purpose. These changes are described in this and previous Travel in London reports. For now, it is important to recognise that comparisons based on like-for-like aggregate average demand in terms of trips or journey stages, as considered above, may conceal other differences of interest.

Features of pandemic travel demand which have largely dissipated

There are also travel demand patterns that changed dramatically during the pandemic but which have mostly reverted to the pre-pandemic status quo as the recovery progresses. These include:

- **Changes in travel demand by time of day**: During the early stages of the pandemic there was much redistribution of travel demand during the day, with noticeably more travel in the early morning and in the inter-peak period and much-subdued demand in the peaks. These patterns seem to have progressively faded as restrictions were lifted and Londoners regained confidence to travel, so that currently the distribution of demand throughout the day for most modes again follows the traditional two peaks, albeit with some minor residual traces of increased demand in the inter-peak and the shoulders of the peaks.
- **Changes in the spatial patterns of travel demand**: Similarly, at the beginning of the pandemic there was a big change in the spatial pattern of travel, with much-reduced demand to and from central London and increased local travel outside the centre, which is now dissipating. However, the reduction of medium- and long-distance commuting into central London due to flexible hybrid and

remote working practices is still noticeable during the working week, and there continues to be relatively more travel in local areas than before the pandemic.

2.3 Mode share changes during the pandemic

In periods of stable travel demand, mode shares tend to change slowly, in an evolutionary way reflecting changes to transport supply and the wider policy context.

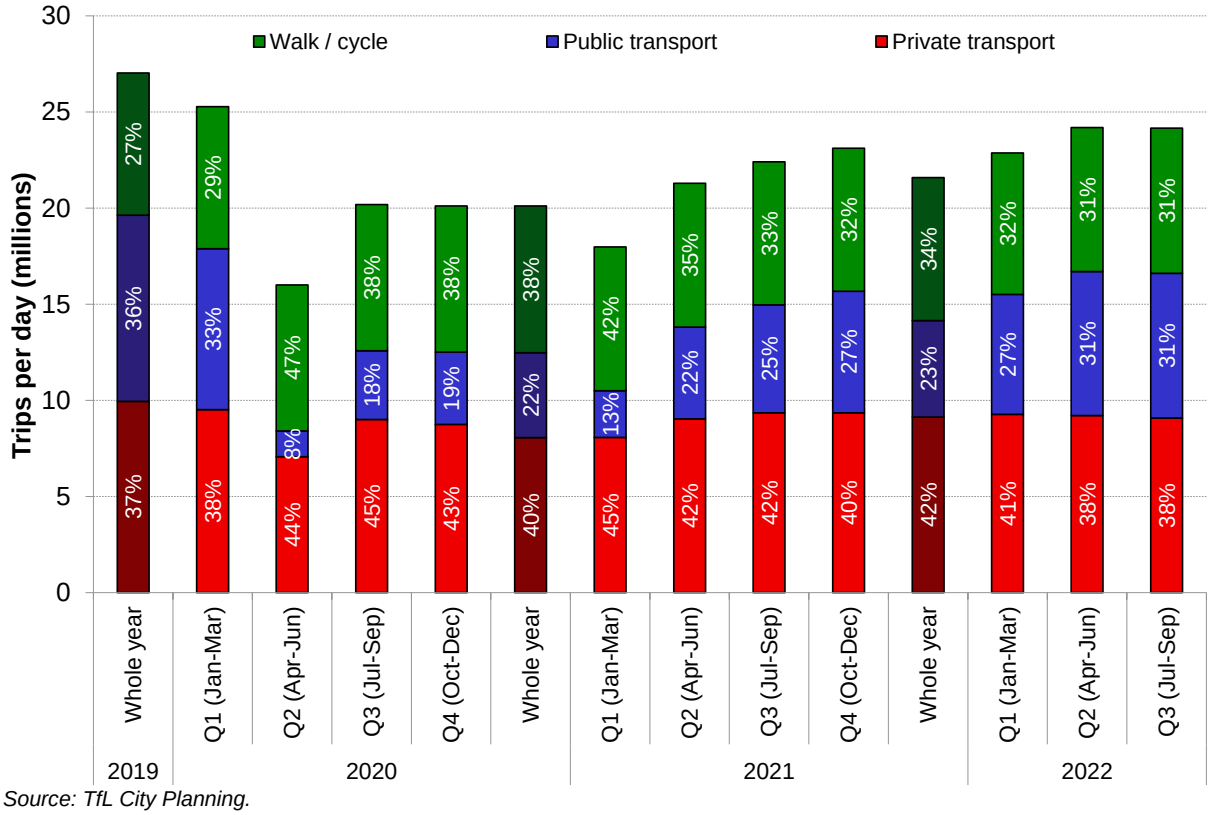
In this way, Travel in London reports tracked a progressive increase in active, efficient and sustainable mode share over the decade prior to the pandemic, latterly in respect of the Mayor's aim for 80 per cent of trips in London to be made by active, efficient and sustainable modes (walking, cycling and public transport) by 2041.

The typical net change in mode share towards these modes was about 0.6 percentage points per year up to 2019. The pace of change slowed during the latter years of the last decade, reflecting, among other things, the general slowdown in the rate of demand growth for public transport, which in turn reflected wider economic and behavioural factors. In 2019 (prior to the pandemic), active, efficient and sustainable modes accounted for an estimated 63.2 per cent of all travel.

The pandemic caused extreme volatility in terms of the total amount of travel, the types of trips being made, and the modes that were best suited to these atypical travel patterns. In turn, this significantly affected the modal balance for travel.

Trip-based mode shares have been estimated on a quarterly basis throughout the pandemic (figure 2.3). It is particularly important in interpreting this graph to recognise that these apply to significantly different travel volumes for each quarter.

Figure 2.3 Estimated quarterly trips and mode shares by mode, 2019-2022.



Source: TfL City Planning.

During relatively normal years, the overall mode share varies little by quarter. However, the impact of the pandemic is evident throughout 2020 and most of 2021.

The disruptions of the various lockdown measures are fully apparent in the quarter from April to June 2020, with public transport mode share down to just 8.4 per cent and the overall active, efficient and sustainable mode share down by 7.3 percentage points.

Despite the reduction in public transport usage, walking and cycling remained relatively high throughout 2020 as Londoners stayed local to do essential shopping or their permitted daily exercise, enabling the overall active, efficient and sustainable mode share to remain above 50 per cent.

During 2021, public transport mode shares gradually increased in line with the gradual relaxation of restrictions, with 27.4 per cent of trips in October-December 2021 being made on public transport. This remained well below the pre-pandemic level of 35.8 per cent.

The relaxation of all pandemic-related restrictions in early 2022 led to a gradual increase in overall trips throughout 2022, with an estimated 24.2 million daily trips in the quarter between July and September. This is still 11 per cent lower than in 2019 but is the highest estimated travel demand since the pandemic began.

Public transport mode shares have increased throughout the year, and are now at 31.2 per cent, with private transport mode shares declining to 37.6 per cent, only slightly higher than in 2019.

Walk and cycle mode shares remain high, although they have been decreasing during 2022 as public transport demand has increased (these are trip-based estimates; many public transport trips involve active travel stages that are not counted separately in this statistic).

The gradual increase in public transport trips in 2022, coupled with high levels of walking and cycling, has led to an increase in the active, efficient and sustainable mode share measure, which at 62.4 per cent in the quarter between July and September 2022 is at its highest level since before the pandemic began, only 0.8 percentage points lower than in 2019.

2.4 Consolidated estimates of travel demand

Introduction

This section presents summary statistics for overall travel in London during the 2021 calendar year and into 2022, set in their longer-term context.

The pandemic led to highly variable levels of travel demand across the whole of this period, with generally lower levels of travel as well as wholesale changes to the nature of travel (such as mode and journey purposes) by many people. For example, many former lengthy, multi-stage commute trips were replaced by shorter, more local trips, perhaps on foot or by cycle.

This volatility is shown by figure 2.1 and the annual averages described below should be interpreted in this context.

Historic trend in total travel (trips)

Between 2000 and 2019, total trips in London increased by 19.3 per cent overall, an average growth of 0.9 per cent per year, with particularly notable increases of 83.6 per cent in rail trips and 53.1 per cent in bus trips, with cycle trips (as main mode) increasing by 137 per cent over this period. Included in these totals are all trips with an origin, a destination, or both, in Greater London by London residents and by non-residents, including commuters and day visitors from outside London as well as overnight visitors and tourists.

The number of trips made in London in 2019 averaged 27.0 million per day, an increase of 0.7 per cent over the previous year (table 2.1). Although the highest annual rate of growth since 2014, it occurred in the context of the general slowing down of travel demand growth in London in recent years, with a net increase in trips of just 1.5 per cent since 2014 compared with an estimated population increase of 4.9 per cent over the same period. In the year immediately before the pandemic, therefore, total travel demand in London had shown signs of returning to growth at a more rapid rate than previous years.

Table 2.1 Estimated daily average number of trips (millions) in Greater London by main mode of travel, seven-day week, 2000-2021.

Year	NR/ LO	LU/ DLR	Bus/ tram	Taxi/ PHV	Car driver	Car passenger	Motor-cycle	Cycle	Walk	All
(2000)	(1.7)	(2.0)	(2.4)	(0.3)	(6.8)	(3.6)	(0.2)	(0.3)	(5.5)	(22.7)
2012	2.6	2.4	4.1	0.3	5.9	3.6	0.2	0.5	6.3	25.8
2013	2.7	2.5	4.1	0.3	5.8	3.6	0.2	0.5	6.3	26.1
2014	2.8	2.6	4.1	0.3	5.9	3.7	0.2	0.6	6.4	26.6
2015	3.0	2.8	3.8	0.3	5.9	3.6	0.2	0.6	6.5	26.8
2016	3.0	2.8	3.7	0.4	5.8	3.6	0.2	0.6	6.6	26.9
2017	2.9	2.8	3.8	0.4	5.8	3.7	0.2	0.6	6.6	26.8
2018	3.0	2.8	3.7	0.4	5.8	3.6	0.2	0.7	6.7	26.9
2019	3.1	2.9	3.7	0.4	5.8	3.6	0.2	0.7	6.8	27.0
2020	1.2	1.2	2.0	0.2	4.7	2.9	0.2	0.9	6.8	20.1
2021	1.3	1.4	2.3	0.2	5.3	3.3	0.3	0.8	6.6	21.6
Percentage change up to 2021 from…										
2000	*-21.5*	*-28.7*	*-11.1*	*-25.3*	*-21.6*	*-7.2*	*31.0*	*162.4*	*20.2*	*-5.8*
2011	*-44.7*	*-37.2*	*-43.8*	*-27.8*	*-9.9*	*-7.0*	*48.0*	*64.2*	*7.3*	*-14.8*
2020	*8.2*	*20.0*	*13.4*	*33.8*	*12.3*	*12.3*	*31.1*	*-5.4*	*-2.3*	*7.3*

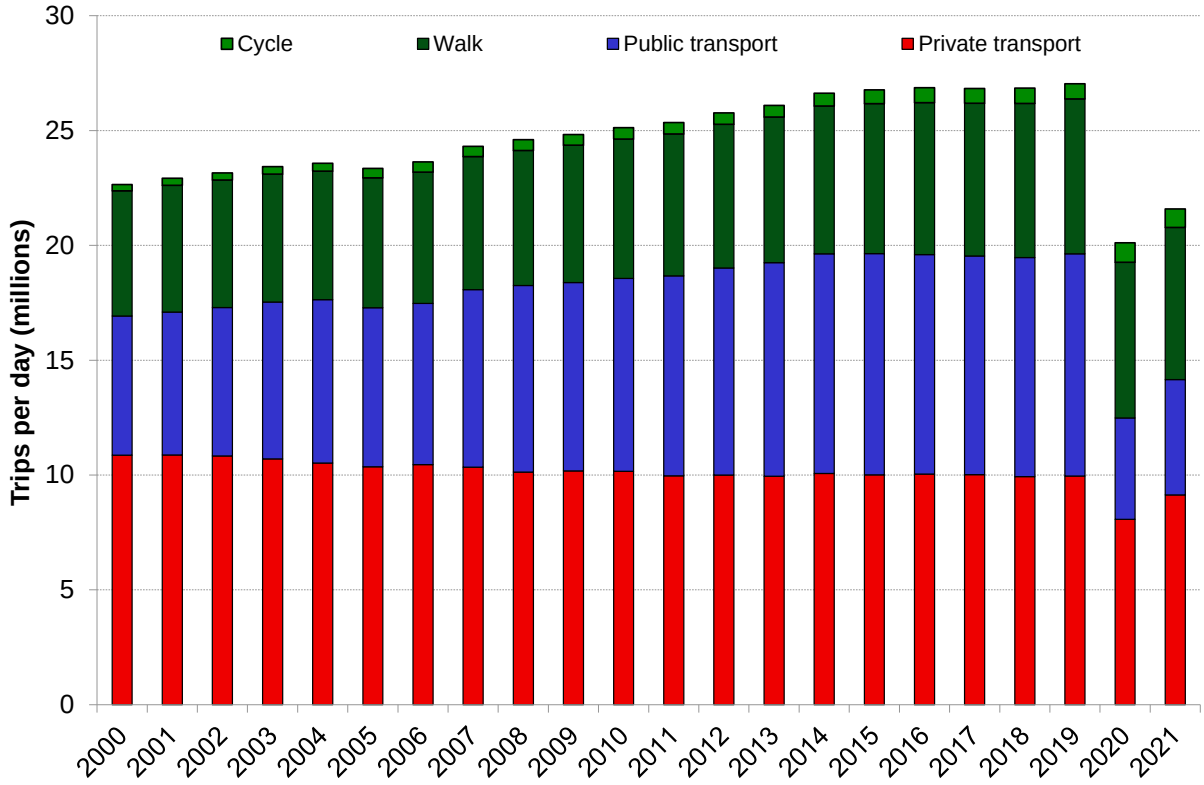
Source: TfL City Planning.
Notes: Trips are complete one-way movements. They may include several modes and journey stages but are classified by the mode that is typically used for the longest distance. Round trips are counted as two trips: an outward and an inward leg.

Estimated number of trips in 2021

In 2021 there were an estimated 21.6 million daily trips on an average day, an increase of 7.3 per cent on 2020. However, the annual average disguises a large degree of variability throughout the year as restrictions related to the pandemic changed, as explored in figure 2.3 above.

Trips on public transport were higher across all modes in 2021 but remained well below pre-pandemic levels. The largest increase was on London Underground, with 20 per cent more trips on average than in 2020. Private transport trips also increased, with car driver and passenger trips 12.3 per cent higher than in 2020. Cycle trips decreased slightly following the large increase in 2020 (figure 2.4).

Figure 2.4 Estimated daily average trips by mode, seven-day week, 2000-2021.



Source: TfL City Planning.

Trips on private transport modes were much closer to pre-pandemic levels than trips on public transport. In 2021, car driver trips were 7.4 per cent lower than in 2019, whereas bus and London Underground trips were 37.5 per cent and 52.4 per cent lower respectively. In contrast, cycle trips remained higher than before the pandemic, on average 23.3 per cent higher than in 2019.

Journey stages estimates

Daily journey stages in London in 2021 were 23.9 million, up from 22.1 million in 2020 but remaining 24.3 per cent lower than the pre-pandemic level in 2019. Table 2.2 and figure 2.5 show the historic trend in total travel at the stage level.

Until 2019 there was a steady increase in journey stages, with a 24.6 per cent increase from 2000. Over the same period National Rail stages were up by 91.0 per cent and buses by 64.0 per cent, despite a fall in patronage in more recent years.

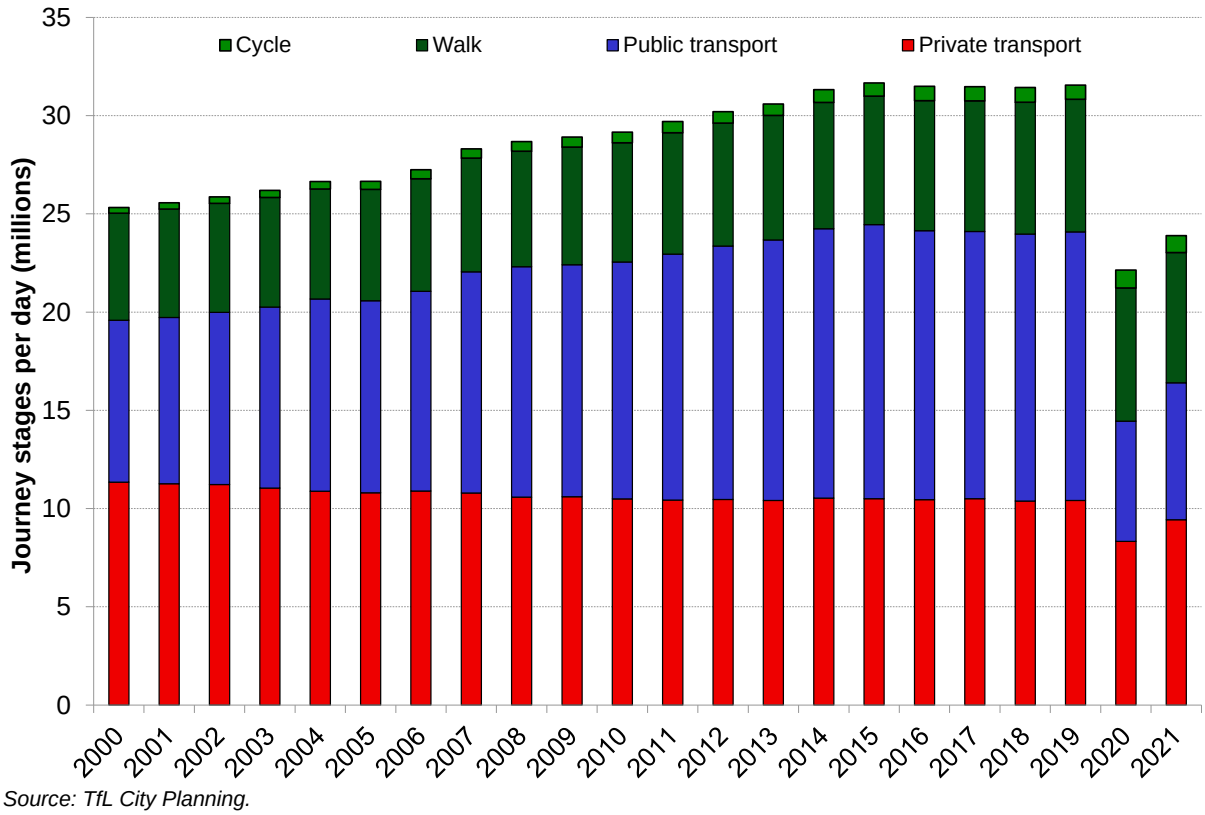
Annual average journey stages in 2021 increased on all modes relative to 2020, except for walking and cycling, following the removal of some pandemic measures throughout the year. There were increases of 19.8 per cent on London Underground, 8.5 per cent on National Rail, 13.4 per cent on buses and 12.3 in car driver stages. Walk stages decreased by 2.3 per cent, and cycle stages by 5.4 per cent, following a large increase in 2020.

Table 2.2 Estimated daily average number of journey stages (millions) in Greater London by mode, seven-day week, 2000-2021.

Year	NR/ LO	LU	DLR	Bus/ tram	Taxi/ PHV	Car driver	Car passenger	Motor-cycle	Cycle	Walk	All
(2000)	(1.8)	(2.6)	(0.1)	(3.7)	(0.4)	(7.0)	(3.8)	(0.2)	(0.3)	(5.5)	(25.3)
2012	2.9	3.3	0.3	6.4	0.4	6.0	3.8	0.2	0.6	6.3	30.2
2013	3.1	3.4	0.3	6.5	0.4	6.0	3.8	0.2	0.6	6.3	30.6
2014	3.2	3.5	0.3	6.7	0.4	6.1	3.9	0.2	0.6	6.4	31.3
2015	3.4	3.7	0.3	6.5	0.4	6.0	3.9	0.2	0.7	6.5	31.7
2016	3.4	3.7	0.3	6.2	0.4	6.0	3.8	0.2	0.7	6.6	31.5
2017	3.3	3.7	0.3	6.2	0.5	6.0	3.9	0.2	0.7	6.6	31.5
2018	3.4	3.7	0.3	6.1	0.4	6.0	3.8	0.2	0.7	6.7	31.4
2019	3.5	3.8	0.3	6.0	0.4	6.0	3.8	0.2	0.7	6.8	31.6
2020	1.4	1.4	0.2	3.2	0.2	4.8	3.1	0.2	0.9	6.8	22.1
2021	1.5	1.7	0.2	3.6	0.3	5.4	3.5	0.3	0.9	6.6	23.9
Percentage change up to 2021 from…											
2000	*-16.2*	*-36.7*	*83.6*	*-2.6*	*-28.2*	*-22.4*	*-8.1*	*37.7*	*201.7*	*21.6*	*-5.6*
2011	*-44.0*	*-47.1*	*-20.0*	*-44.0*	*-28.8*	*-11.1*	*-8.0*	*48.0*	*51.1*	*7.3*	*-19.5*
2020	*8.5*	*19.8*	*21.7*	*13.4*	*33.8*	*12.3*	*12.3*	*31.1*	*-5.4*	*-2.3*	*7.9*

Source: TfL City Planning.
Note: Journey stages are parts of trips by a single mode. Each rail (but not London Underground) interchange between train operating companies or bus boarding is a new stage. Walks are counted only when they are complete (all-the-way) trips.

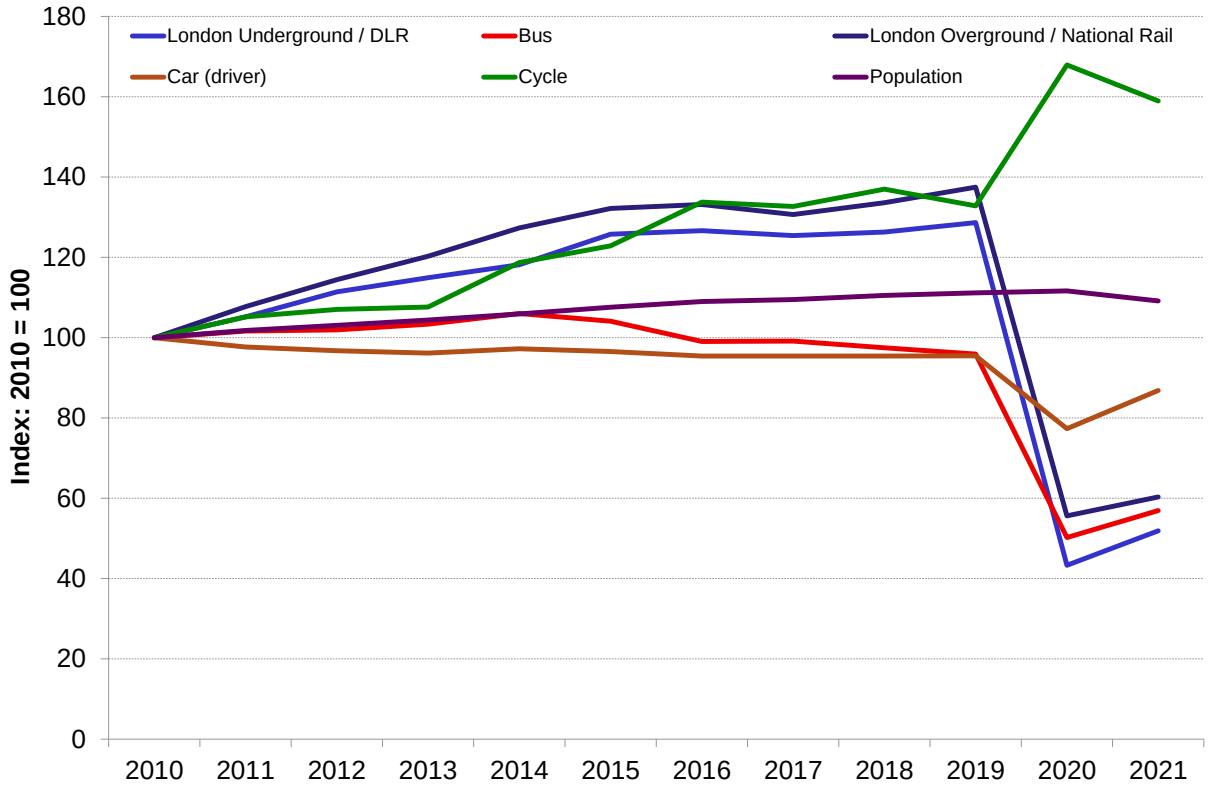
Figure 2.5 Estimated daily average stages by mode, seven-day week, 2000-2021.



Source: TfL City Planning.

Figure 2.6 shows trends in demand on selected travel modes since 2010.

Figure 2.6 Change in journey stages on selected modes, 2010-2021.



Source: TfL City Planning.

The longer-term trend up to 2016 shows a strong increase in demand across rail-based public transport modes, all growing faster than the population, reflecting changing mode shares and substantial investment in public transport.

National Rail journey stages increased by 33.2 per cent between 2010 and 2016, partly helped by the opening of TfL's London Overground network. London Underground growth was also strong over this period, increasing by 26.7 per cent, reflecting the completion of upgrades to several lines, which added extra capacity to the network. Since 2016, growth has been more modest on both these modes.

In contrast, bus demand followed population growth between 2010 and 2014, but has declined since. In 2019, bus stages were 4.1 per cent lower than in 2010. Car driver stages in 2019 were 4.5 per cent below the 2010 level. Growth has also been high in cycle journey stages, which grew by 32.8 per cent between 2010 and 2019.

The effects of the pandemic are clear in 2020 and 2021, with demand falling heavily on all public transport modes, before a slight recovery in 2021.

While car journeys also decreased, the rate of decrease was much lower than for public transport. Most noticeable on the chart is the sustained increase in cycle journeys, as Londoners made shorter, more local journeys. Cycle journeys decreased in 2021 relative to 2020 but remained well above pre-pandemic levels. In contrast, despite the recovery in public transport journeys throughout 2021, these remained well below 2019 levels across all modes.

2.5 Mode share estimates

Introduction

Mode shares reflect the choices that people make for travel in London given the connectivity provided by the transport networks.

The Mayor's aim is for 80 per cent of trips in London to be made by active, efficient and sustainable modes (walking, cycling and public transport) by 2041. This section looks at historic trends in mode share and recent changes to this.

The previous decade saw steady progress in the proportion of travel in London undertaken by active, efficient and sustainable modes. Public transport accounted for 35.8 per cent of trips in 2019, up from 26.8 per cent in 2000 and 33.4 per cent in 2010. Correspondingly, private transport (mainly car) accounted for 36.8 per cent of trips in 2019, down from 48.0 per cent in 2000 and 40.4 per cent in 2010 (table 2.3).

Table 2.3 Trip-based mode shares by type of transport, 2000-2021.

Year	Public transport	Private transport	Cycle	Walk
(2000)	(27%)	(48%)	(1.2%)	(24%)
2012	35%	39%	1.9%	24%
2013	36%	38%	1.9%	24%
2014	36%	38%	2.1%	24%
2015	36%	37%	2.2%	24%
2016	36%	37%	2.4%	25%
2017	35%	37%	2.4%	25%
2018	36%	37%	2.5%	25%
2019	36%	37%	2.4%	25%
2020	22%	40%	4.2%	34%
2021	23%	42%	3.7%	31%

Source: TfL City Planning.
Note: Trips are classified by the mode that is typically used for the longest distance. Annual average values for 2020 and 2021 should be interpreted in the context of the volatility in travel demand caused by the coronavirus pandemic (see also figure 2.1).

Over the longer term, the decrease of 11.8 percentage points between 2000 and 2019 in the private transport mode share in terms of journey stages is equivalent to a decrease of 11.2 percentage points in terms of trips.

Similarly, the public transport mode share, which increased by 10.8 percentage points in terms of journey stages, increased by nine percentage points in terms of trips since 2000 (note that public transport trips typically involve more than one stage). To 2019, this was equivalent to three million fewer car trips per day in London compared to 2000, if the mode shares had stayed the same.

In later years the pace of change had slowed, however, largely reflecting subdued growth or decline in public transport patronage.

In 2019, the private transport mode share decreased by 0.2 percentage points compared with 2018. Public transport mode share increased by 0.3 percentage

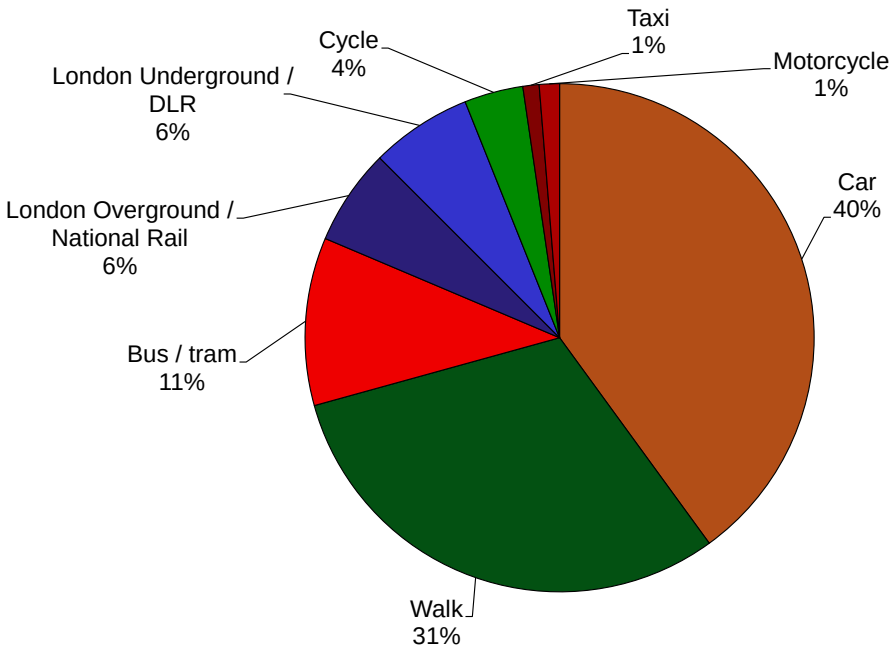
points in 2019. In 2000, cycling accounted for 1.2 per cent of all trips in London, rising to 2.0 per cent in 2010 and 2.4 per cent in 2019.

Trip-based mode share estimates

The effects of the pandemic continue to be apparent in the estimates for 2021. In spite of the increase in public transport trips, the public transport mode share remained below pre-pandemic levels at 23.3 per cent, with private transport making up 42.3 per cent of all trips on an annual average basis (figure 2.7).

Despite the decreases in active modes, both walk and cycle mode shares remain higher than before the pandemic, with just less than a third of all trips in 2021 being walk trips. The private transport mode share of 42.3 per cent was the highest since 2007.

Figure 2.7 Mode share of daily trips in London, 2021.



Source: TfL City Planning.

As with the total trip estimates, the overall average mode share for 2021 disguises some major fluctuations in this measure during the year, with a smaller volume of daily trips throughout most of the year leading to higher mode shares for those modes that saw the smallest decreases in demand.

Stage-based mode share estimates

As shown in table 2.4, in 2021 29.2 per cent of journey stages in London were made by public transport, compared with 39.5 per cent by private transport. Public transport mode share increased slightly compared to 2020 but remained well below pre-pandemic levels.

In contrast, private transport mode share reached its highest level since 2006. Despite a decrease in walk and cycle stages compared to 2020, mode shares remained well above pre-pandemic levels, at 27.7 per cent and 3.6 per cent, respectively.

Table 2.4 Stage-based mode shares by type of transport, 2000-2021.

Year	Public transport	Private transport	Cycle	Walk
(2000)	(33%)	(45%)	(1.1%)	(22%)
2012	43%	35%	1.9%	21%
2013	43%	34%	1.9%	21%
2014	44%	34%	2.1%	21%
2015	44%	33%	2.1%	21%
2016	43%	33%	2.3%	21%
2017	43%	33%	2.3%	21%
2018	43%	33%	2.4%	21%
2019	43%	33%	2.3%	21%
2020	28%	38%	4.1%	31%
2021	29%	39%	3.6%	28%

Source: TfL City Planning.

Active, efficient and sustainable mode share

Active, efficient and sustainable modes are defined in the Mayor's Transport Strategy as walking, cycling and public transport. The active, efficient and sustainable mode share is calculated in terms of all trips, by all people (including residents and visitors) travelling in London, on an annual average day.

There was a continuous year-on-year increase in the active, efficient and sustainable mode share between 2000 and 2019, averaging 0.6 percentage points per year, but with the pace of change slowing over more recent years (table 2.5).

In 2021, the active, efficient and sustainable mode share declined by 2.2 percentage points, relative to 2020, to 57.7 per cent. This was mainly due to a weak recovery in public transport trips throughout 2021, compared to private transport trips which were much closer to pre-pandemic levels.

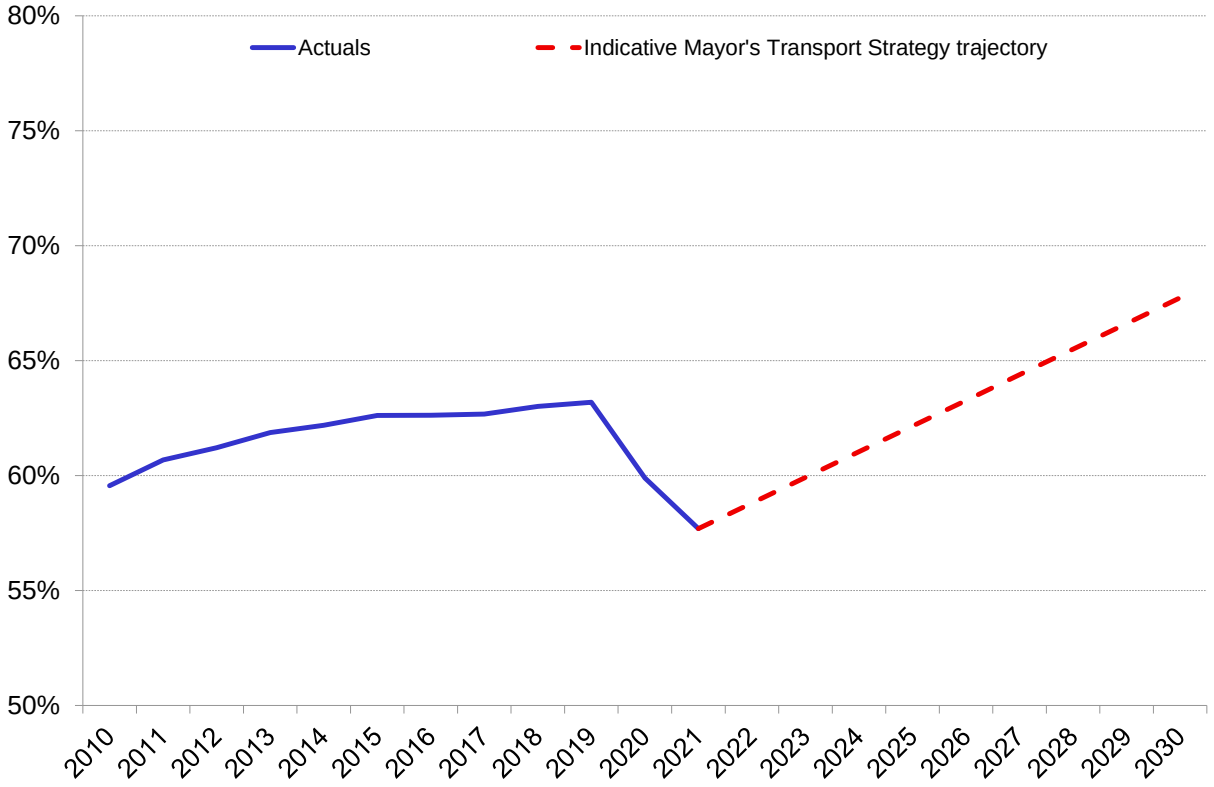
Table 2.5 Share of trips and journey stages made in London by active, efficient and sustainable modes, 2012-2021.

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Trips	61.2%	61.9%	62.2%	62.6%	62.6%	62.7%	63.0%	63.2%	59.9%	57.7%
Journey stages	65.4%	66.0%	66.4%	66.8%	66.8%	66.6%	67.0%	67.0%	62.4%	60.5%

Source: TfL City Planning.

Figure 2.8 shows the active, efficient and sustainable trip-based mode share ambition in the historic context.

Figure 2.8 Active, efficient and sustainable trip-based mode share, 2010-2030.



Source: TfL City Planning.

2.6 London's population

London's population and the 2021 Census

A decennial Census of Population was conducted across the UK in March 2021.

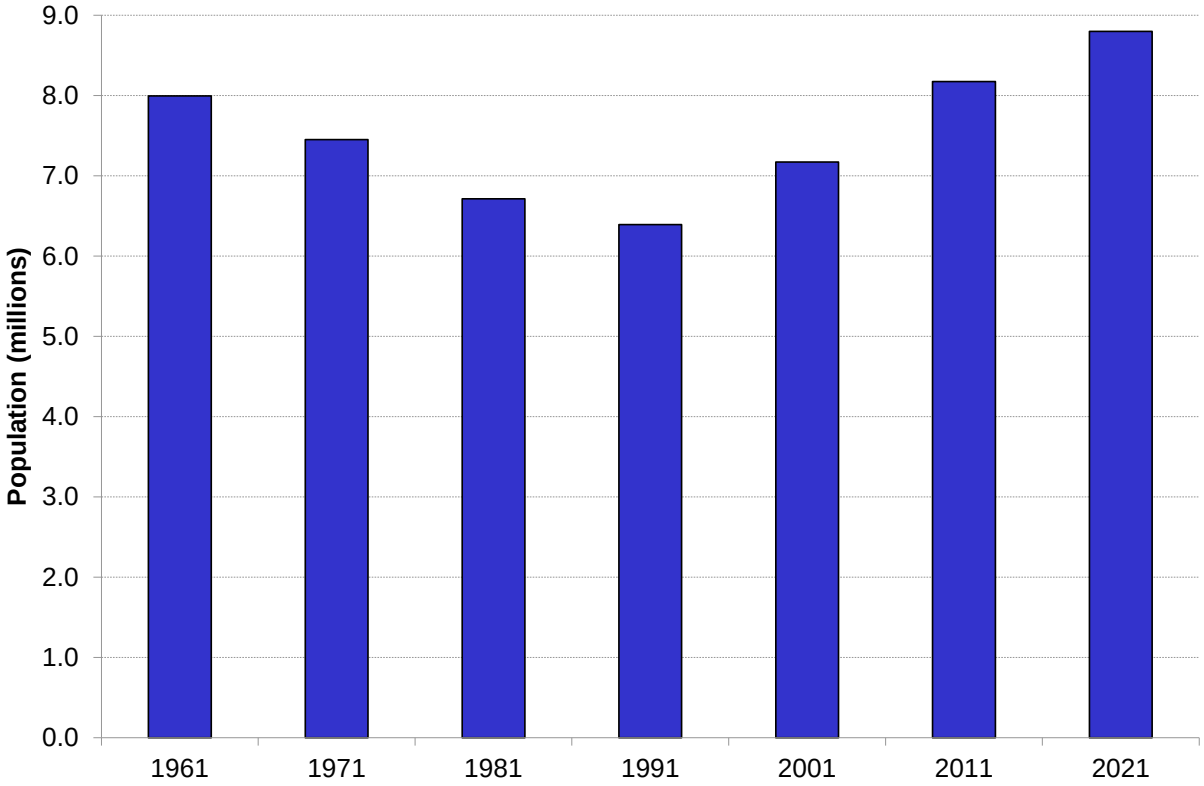
While the timing reflected the later stages of pandemic restrictions, the Census gave a firm quantified estimate of the population of London for the first time since 2011, allowing a re-benchmarking of the annual mid-year estimate cycle on which many of our previous conclusions about the impact of London's changing population on travel demand had been based.

Although the data is still undergoing analysis by Office for National Statistics, the following are the key emerging conclusions so far (figure 2.9):

- The 2021 Census estimates London's population as 8.8 million, an increase of 7.7 per cent compared with 2011 (8.2 million). In contrast, the growth between 2001 and 2011 was 14 per cent. This is lower than the mid-year estimate for 2020, which was 9.0 million.
- Population growth has been highest in east London, with low growth in southwest London and an indicated population decline in central and inner west London, perhaps reflecting temporary arrangements during the pandemic restrictions that were in place at the time of the Census.
- London's population is getting older. The highest growth rates between 2011 and 2021 were in people in their 50s, 60s and 70s, with the largest in people in their

50s (a 30 per cent increase). The number of people in their 20s declined, as did the number of children aged under five.

Figure 2.9 Long-term trend in London's resident population, 1961-2021.



Source: Office for National Statistics.

The estimate of London's population in 2021 was lower than previously predicted and potentially reflects upon the slowing of the rate of growth in demand, particularly for public transport, observed in the immediate pre-pandemic years, which was identified in previous Travel in London reports.

For the future, lower estimated population growth (and changing age profiles) will have implications for travel demand forecasts and our wider planning assumptions. These implications are currently being worked through.

2.7 Recent economic trends

Previous Travel in London reports have examined the specific impacts of the pandemic on the economy of London, and highlighted developments of particular concern. These included:

- The overall cost of the pandemic to London's economy, both direct, in terms of the Government response (such as the furlough scheme) but also indirect, in terms of lost productivity and opportunity.
- The potential of the pandemic to widen pre-existing inequalities in the wealth and wellbeing of Londoners, particularly for those in less secure employment or otherwise vulnerable.

- A particular vulnerability of the central London economy, this being dependent on office-based commuting and retail/leisure activities, including tourism, all of which were well below normal levels for much of the pandemic and which remain vulnerable to longer-lasting change.

Prior to the pandemic, a prolonged 'income squeeze' stemming from the banking crisis of 2008 was thought to have been a significant factor underlying the slow and progressive erosion in the historically high rate of growth for public transport demand in London, as observed during the latter years of the last decade.

Falling real incomes combined with high costs for housing were thought to be limiting the scope for discretionary activities involving travel, resulting in lower per capita demand for discretionary travel. This meant that total travel was growing at a slower rate than total population, according to the contemporary mid-year population estimates (see above).

The pandemic is likely to have exacerbated these existing economic pressures, while introducing new ones of collectively greater magnitude. A potentially key change, however, is that the pandemic necessarily exposed many people to the experience of remote working, remote shopping and remote leisure, at least temporarily decoupling the need to travel to carry out daily activities. While for some this was, under the duress of the pandemic, undesirable and short term, for others it opened up opportunities to optimise their daily activities and to save money. The extent to which this persists, and more permanently reduces travel demand in an era of high cost-of-living pressures, remains to be seen.

As we emerge from the pandemic a new range of economic concerns are on the horizon, the principal ones of which are summarised below:

- A sharp rise in inflation, latterly reaching more than four times the Bank of England's target of two per cent. This primarily reflected increasing energy prices following the Russian invasion of Ukraine in February 2022 that are working through into most aspects of the economy, but also various pandemic legacies such as acute labour shortages and consequent wage inflation.
- Although interest rates remain very low by historic standards, they have risen several times in recent months, mirroring a global trend, primarily as a response to rising inflation. Should interest rates continue to rise, this would further constrain the disposable income available for discretionary activities involving travel (for example for those paying a mortgage) and would undermine wider business confidence.
- Low-income Londoners were more likely to dip into savings during the pandemic (in part due to an increased likelihood of being furloughed), while higher income groups tended to save money during the pandemic. It is likely that this inequality will continue to be exacerbated as cost-of-living pressures increase, as low-income households have limited scope to cut back on non-essential items to cope with the rising costs of essential goods, while those on higher incomes have greater discretionary spending which could be scaled back to cope with the impact of rising prices.
- More general concerns about the changing international climate and London's place in the global economy, with the economic impacts of the UK's departure from the European Union yet to be fully seen, and concerns over energy supply security this winter.

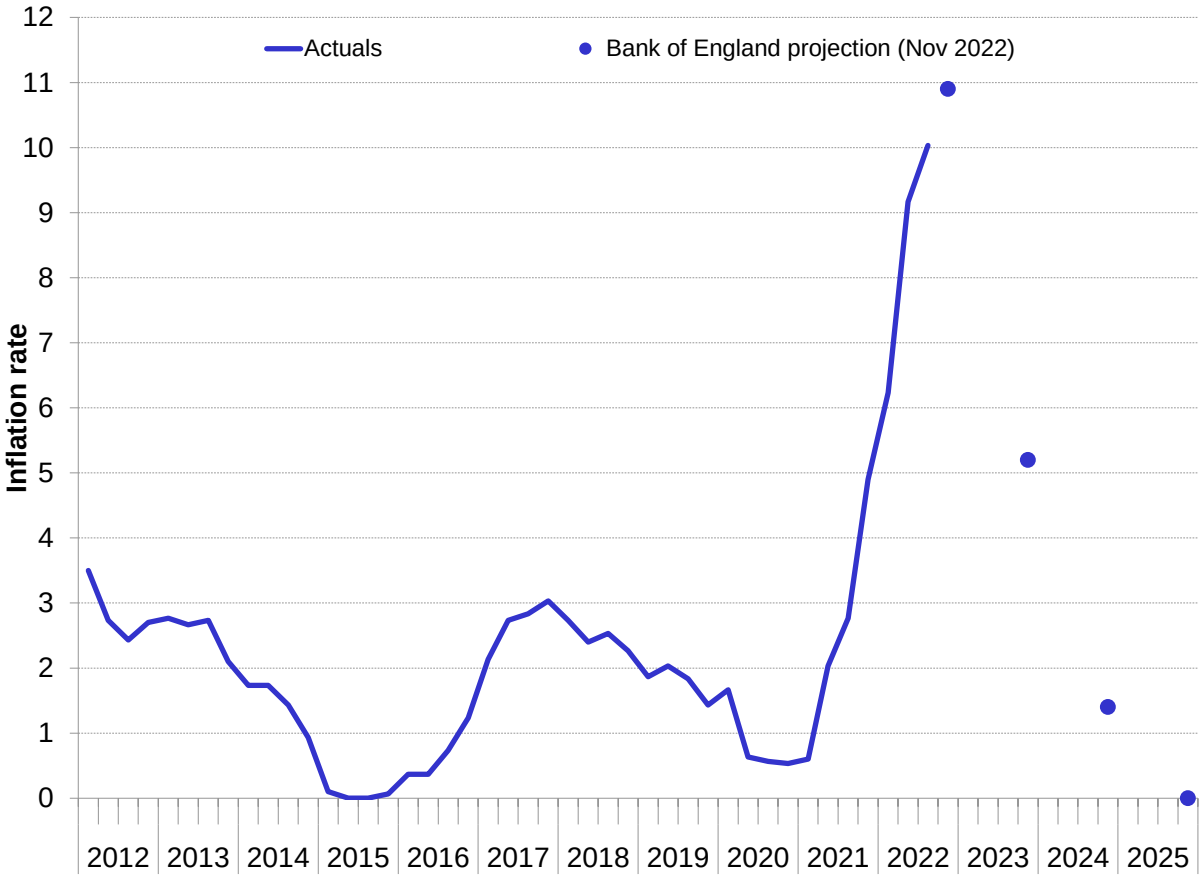
Emerging cost-of-living pressures

In September 2022 consumer price index (CPI) inflation stood at 10.1 per cent, which compared to 1.8 per cent prior to the pandemic. Although it had been on the rise since mid-2021, a sharp increase in April 2022 resulted in CPI inflation reaching the highest levels since records began in 1989 (figure 2.10).

The most recent Bank of England Monetary Policy Report estimates that inflation will reach 10.9 per cent in the fourth quarter of 2022 (October-December).

CPI inflation is expected to fall somewhat in 2023, although it is forecast to remain high, at 5.2 per cent in quarter 4 2023 (October-December). Levels are expected to fall sharply in 2024 to 1.4 per cent in quarter 4 2024 (October-December), below the Bank of England's target level of two per cent.

Figure 2.10 Consumer price index inflation and Bank of England projection by quarter, 2012-2025.



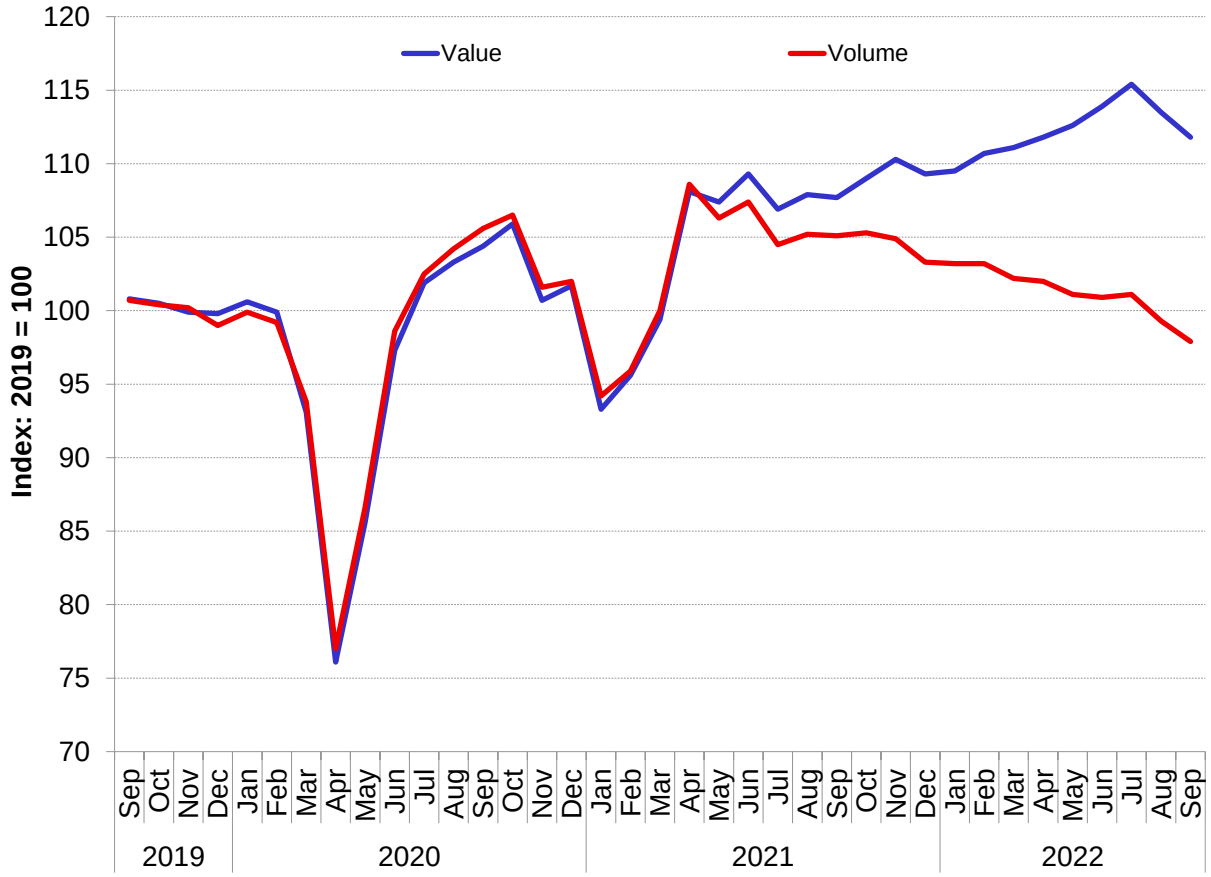
Source: Office for National Statistics and Bank of England.

Rising inflation can be seen also in the widening gap between UK retail sales by volume and value (figure 2.11).

This shows that both prior to and during the pandemic sales volumes and values largely tracked each other. However, from late 2021 sales values have risen, while sales volumes have declined.

Retail sales volumes in September 2022 were below February 2020 levels. The sectors with the greatest month-on-month fall in sales volumes in September 2022 were online retailing (three per cent) and food stores (1.8 per cent).

Figure 2.11 Change in monthly retail sales, Sep 2019-Sep 2022.



Source: Office for National Statistics.

A recent report from the GLA titled The rising cost of living and its effects on Londoners showed that in July 2022 up to 90 per cent of Londoners said their household costs had risen over the last six months. To manage this, 29 per cent are buying less food and essentials, and 47 per cent are buying cheaper products.

The emerging cost-of-living crisis is having a greater impact on certain groups, which is likely to further drive inequality. Some 19 per cent of Londoners state that they are financially struggling, defined as going without their basic needs and/or relying on debt or struggling to make ends meet. This compares to 31 per cent of Black Londoners and 31 per cent of disabled Londoners.

By income group, low-income Londoners were most likely to say they were financially struggling in July 2022 (30 per cent), rising four percentage points from January 2022. However, there was a large increase in London residents in the £20,000-£40,000 household income bracket, rising from 14 per cent in January 2022 to 26 per cent in July 2022. This demonstrates that an increasing proportion of Londoners are feeling the impact of rising costs. It remains to be seen, however, how reductions in spending will work through to travel demand trends, particularly for discretionary trips.

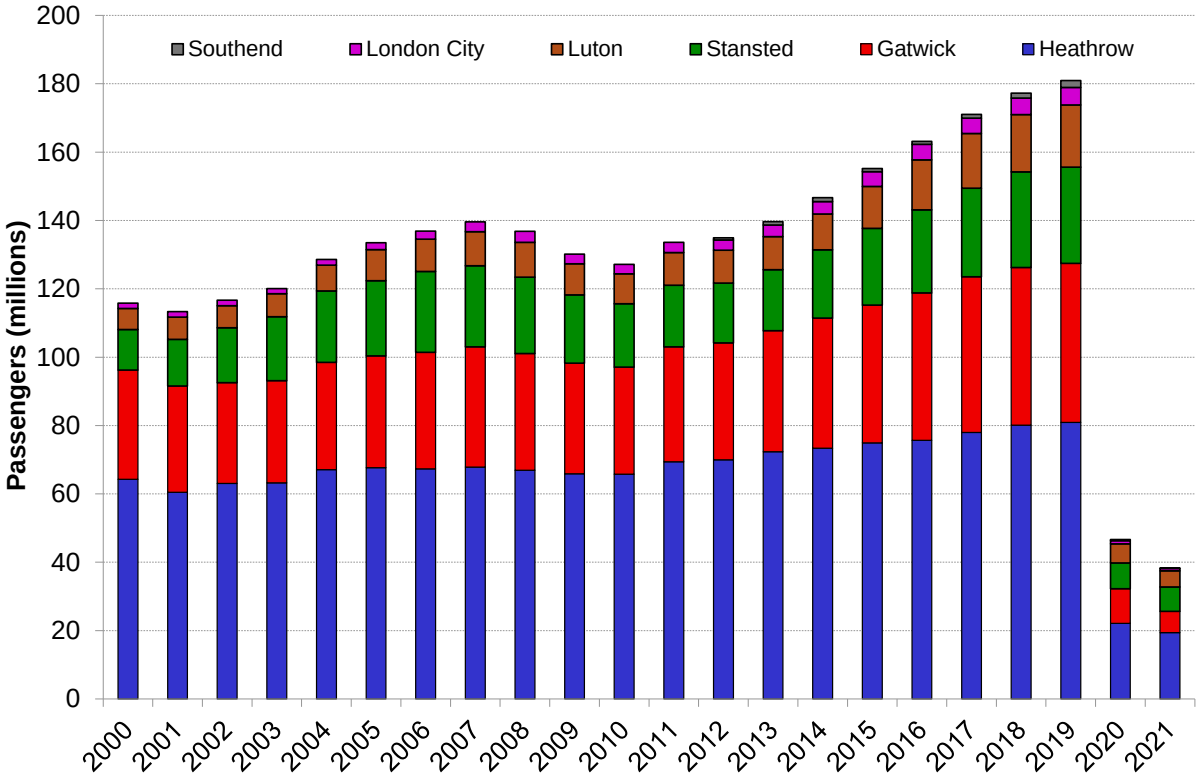
2.8 International visitors to London

International visitors to London accounted for an estimated four per cent of all travel in London on an average pre-pandemic day, and the number of international visitors to London had increased each year since 2009, with an aggregate increase of 44 per cent over the period from 2009 to 2019.

As with domestic visitors, the International Passenger Survey that tracks international visitors to the UK was suspended at the start of the pandemic, meaning that data for this measure was unavailable for 2020. The survey restarted in January 2021, but the number of interviews was severely impacted for a large part of the year. In 2021, it was estimated that London had 2.7 million international visitors in total, 87 per cent fewer than the record 21.7 million in 2019.

Demand for air travel through London's airports had been increasing steadily since 2012, reflecting recovery from the recession in the latter part of the last decade. However, due to the pandemic, the number of passengers declined substantially in 2020, falling by 74 per cent to just 46.7 million (figure 2.12).

Figure 2.12 Terminal passengers by London airport, 2000-2021.

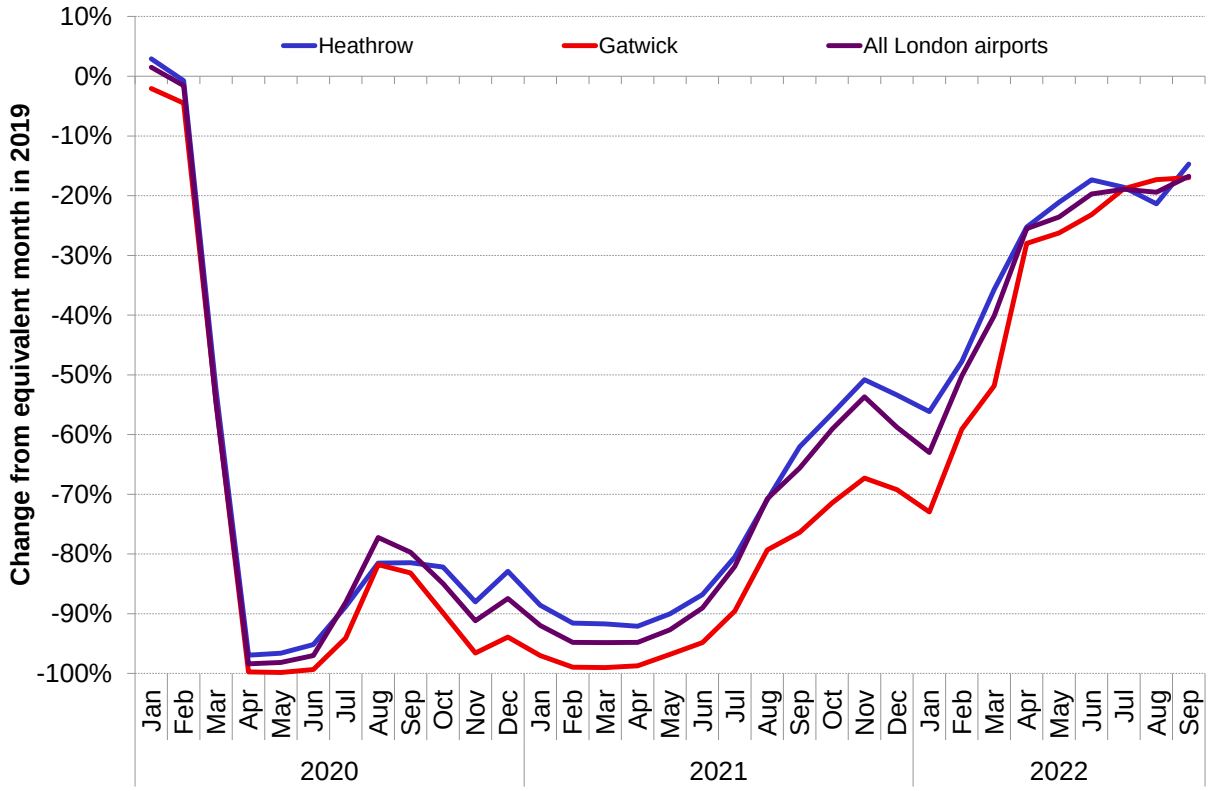


Source: Civil Aviation Authority.

In 2021, the number of passengers declined again to 38.3 million, 79 per cent lower than in 2019. Alongside commuters, therefore, the lack of non-resident visitors was a major factor underlying travel demand levels during the pandemic, particularly in central London.

However, the latest monthly data on terminal passengers at London's airports shows a strong return towards pre-pandemic levels throughout 2022, following the removal of all remaining travel restrictions in the UK in March 2022 (figure 2.13).

Figure 2.13 Monthly airport terminal passenger demand compared to the equivalent month in 2019, Jan 2020-Sep 2022.



Source: Civil Aviation Authority.

In January 2022, passenger numbers were 63 per cent lower than before the pandemic. By July, passenger numbers were down by just 19 per cent, despite some airports introducing caps on passenger numbers throughout the summer period. Heathrow Airport is now once again the busiest airport in Europe, while in summer 2021 it ranked as only the 10th busiest on the continent.

2.9 Discerning the future: updating our scenarios

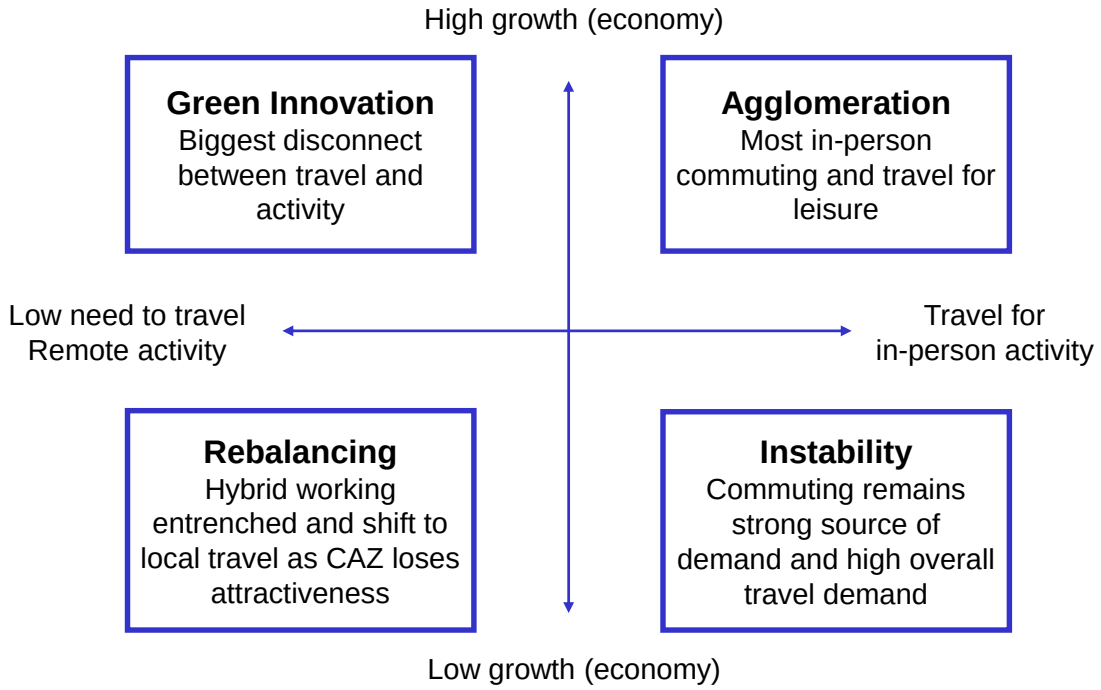
In 2019 TfL adopted a scenario planning approach to dealing with uncertainty to ensure that our long-term plans are robust and resilient. These scenarios were used across TfL and applications included the Capital Planning work, the Service Level Reviews, and in the development of the Hybrid Forecast.

Now that London is recovering from the pandemic, our scenarios have been updated to build on previous work and reflect new long-term risks, challenges and opportunities.

Four new scenario narratives up to 2041 have now been developed to reflect the envelope of uncertainty for our planning. The scenarios are intended to be plausible and internally coherent alternative futures for London, given what is known now, but there are many combinations of circumstances that could give rise to the outcomes illustrated for each of the scenarios.

The broad characteristics of these scenarios are illustrated by figure 2.14 and described below:

Figure 2.14 Characteristics of the revised scenarios for London up to 2041.



Source: TfL City Planning.

- **Agglomeration**: The story of a resurgent and prosperous London which has retained and developed world-leading status in finance and technology. It is a crowded, bustling and competitive city which has seen strong population and employment growth since the 2020s. While attractive to many, inequality is high and there is crowding and congestion on the transport networks. Extreme climate events have become more frequent. The focus is on adaptation to deal with crises and build defences, rather than structural or behavioural change to reduce carbon dioxide emissions.
- **Green Innovation**: A scenario where London has successfully reinvented itself as a global centre for green innovation. The character of London has changed progressively around this: London is now cleaner, calmer and a more equitable place to live and a model sustainable city for the 21st century. The Central Activities Zone (CAZ) is a global attractor for showcasing climate change mitigation and adaptation technologies with strong government and business support for decarbonisation and sustainable behaviours. The CAZ also offers a burgeoning leisure scene which is booming. There is widespread adoption of flexible working and a shift to localism for everyday or 'lower-value' trips.
- **Rebalancing**: A story of lost opportunity and competitiveness for London in a challenging global context. International tensions and constrained availability of commodities underlie a long-term cost-of-living squeeze which has emphasised self-sufficiency and more local living. Central London has declined in importance and international reputation, which has had an impact on the rest of London as transport networks have become somewhat neglected. There have been improvements to the urban realm due to less traffic and better air quality. Over time, equality improves due to a subdued housing market and less income disparity. Despite a shift to more renewable energy sources in some sectors,

London fails to successfully mitigate or adapt to climate change due to a lack of coordination and funding.

- **Instability**: In this scenario, London has battled resiliently through constant headwinds of global and natural adversity which has caused fluctuations in travel demand. There is a high population, partly reflecting high in migration which, in turn, reflects international political and environmental instability. This creates accompanying pressures and inequalities – particularly in inner London. International events, cost-of-living pressures and uncertainty over commodity supplies have suppressed business and individual initiative, leading to a persistent lack of investment and an emphasis on getting through the short term. This short-sightedness, alongside political distraction results in a lack of planning or investment to tackle climate change.

The scenarios will be finalised and used with our two fully modelled forecasts for future planning:

- A Planning Forecast (formerly known as the Reference Case) for travel demand in London with a high office return and London's population reaching 10.8 million by 2041.
- A Hybrid Forecast drawn from emerging evidence on how London is changing.

Forecast definition

Both forecasts contain the same portfolio of investment limited to only those schemes that are funded and committed.

The Planning Forecast includes a modest increase in working from home compared to pre-pandemic forecasts, with levels of online shopping remaining as forecast before the pandemic and London getting back on track for achieving pre-pandemic projections of population growth by 2041.

The Hybrid Forecast, however, incorporates evidence on how London is changing:

- The latest population and employment projections, following a more central trend than the Planning Forecast.
- More working from home for office workers, particularly for those on high incomes and for offices in central London.
- A greater shift towards online shopping with people making fewer but more local shopping trips.
- Greater flexibility to undertake leisure trips as part of the working day due to more home working.
- Slightly higher relative car ownership, largely due to lower house building and a small minority of the population who are reluctant to return to public transport after the pandemic.

The very latest evidence has recently been reviewed as part of the annual update of the forecasts, and will incorporate:

- The latest population and employment projections, including some spatial redistribution of jobs in London.
- An increase in light goods vehicle (LGV) trips across London associated with more home deliveries and private use but with fewer trips to central London; alongside a drop in post-pandemic heavy goods vehicle (HGV) trips due to

reduced activity in some of the main sectors (for example construction, general haulage and retail) and particularly in central London.

- Updated forecasts of the number of international visitors.

3. The travel behaviour of London residents

3.1 Introduction

This chapter looks at aspects of the travel behaviour of London residents as tracked through our London Travel Demand Survey (LTDS).

The pandemic placed restrictions on the normal conduct of this survey, which would usually consist of full-household, face-to-face interviews with a detailed one-day travel diary. Therefore, during the pandemic a scaled-down version of the survey was conducted by telephone.

While useful for understanding the overall scale of changes to travel and the factors giving rise to it throughout the pandemic, data from this version of the survey (covering the 2020/21 and 2021/22 financial years) is not wholly comparable to the historic series. Key findings from this version of the survey were discussed in Travel in London reports 13 and 14.

From April 2022 the previous methodology for the survey was reinstated, with some adaptations to the questionnaire content to cover aspects of particular interest to London's pandemic recovery.

At the time of writing, indicative results for the first half of 2022/23 are available from this survey (note that the survey data is usually consolidated, expanded and bias corrected on an annual financial year basis).

3.2 Per person trip rates

The LTDS has tracked a pattern of generally falling trip rates over its lifetime (figure 3.1), this trend accelerating between 2013/14 and 2017/18 and having parallels at the national scale in the Department for Transport's National Travel Survey.

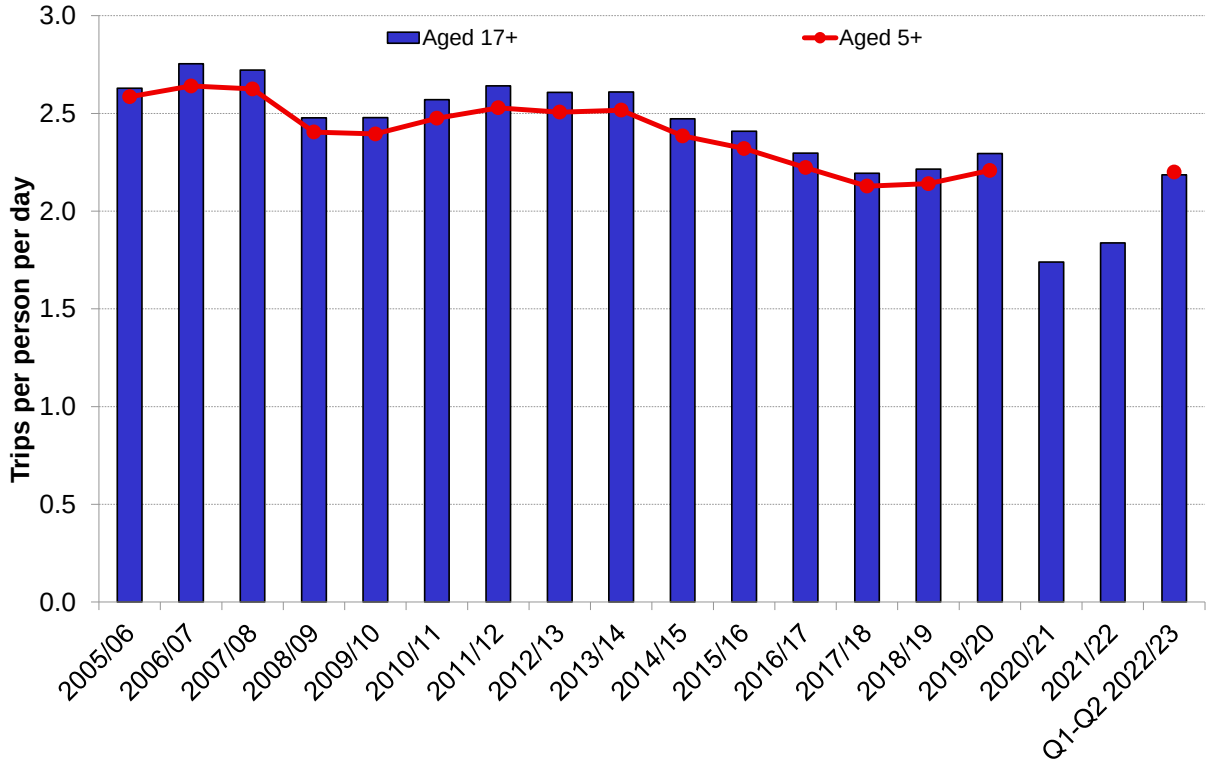
However, in the two years prior to the pandemic the number of trips per day made by the average London resident increased slightly, to 2.21 trips by those aged 17+ in 2018/19 and 2.29 in 2019/20 (thought to be due to improving economic conditions).

During 2020/21, the first year of the pandemic, the average daily trip rate was 24 per cent lower than 2019/20, at 1.74 trips per person per day. The daily trip rate increased by six per cent in 2021/22 compared to 2020/21, to 1.84 trips per person per day, reflecting the start of the recovery from the pandemic.

The latest (provisional) data from the LTDS 2022/23 (April-September) shows that the trip rate has increased further to 2.19 trips per person per day, an increase of 19 per cent on 2021/22 and only five per cent below the 2019/20 average.

The average distance travelled per person per day in 2019/20 was 9.4km. This reduced by 47 per cent to 5.0km in 2020/21, increasing by 17 per cent to 5.9km in 2021/22. The latest provisional data for 2022/23 (April-September) shows that the average distance travelled per person is 8.7km (seven per cent below the pre-pandemic average and following the pattern of trip rates).

Figure 3.1 Trip rate among London residents, LTDS, 2005/06-2022/23.



Source: TfL City Planning.
Note: The historic series has been amended to represent those aged 17+ for consistency with the adapted data collection during the pandemic. The line shows the trend for those aged 5+ (the usual survey methodology).

Based on these (early and provisional) indicators, it seems that overall volumes of travel among London residents are returning to pre-pandemic levels, yet there are still significant modal discrepancies in the aggregate (all traveller) data described in chapter 2 of this report.

3.3 Journey purposes

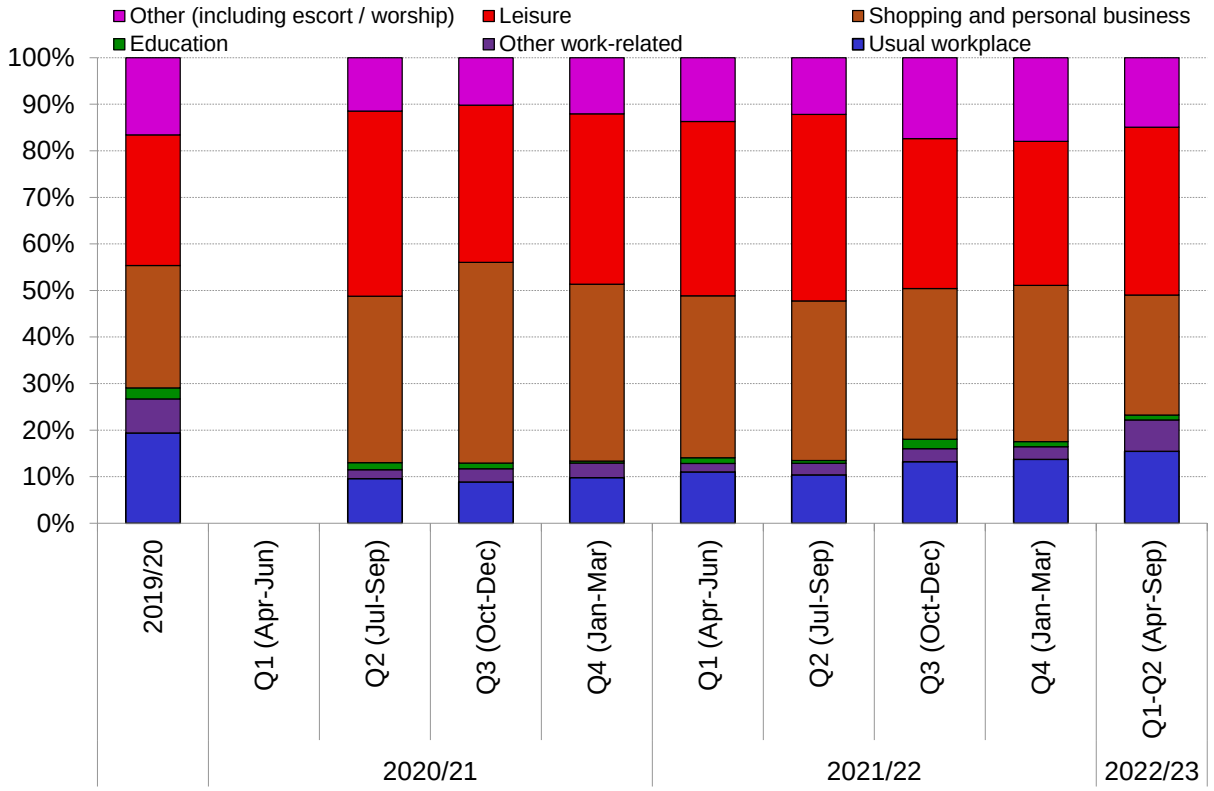
Figure 3.2 shows that, prior to the pandemic in 2019/20, just less than one fifth of trips made by London residents aged 17+ were for commuting and a further seven per cent of trips were work-related (for example travelling to a meeting). Shopping, personal business and leisure trips accounted for just more than half of all trips (54 per cent) and 17 per cent were made for other purposes.

During the early part of the pandemic, the share of trips for commuting halved to around 10 per cent, as did the share of work-related trips (to three per cent) as many office workers began working from home in line with national guidance.

By contrast, the share of shopping, personal business and leisure trips increased considerably to account for most trips (between 75 and 80 per cent), a reflection of the activities that were permitted during periods of travel restrictions.

Note that the share of education trips is low throughout because the data from the pandemic survey relates to residents aged 17+ only.

Figure 3.2 Proportion of trips by journey purpose, London residents aged 17+, LTDS, 2019/20-2022/23.



Source: TfL City Planning.

The latest data from 2021/22 and the first half of 2022/23 shows that:

- The share of commuting trips has gradually increased from the low of nine per cent in quarter 3 2020/21 (October-December) to 15 per cent in the first half of 2022/23. The share of work-related trips has also gradually increased, from less than two per cent in quarter 1 2021/22 (April-June) to seven per cent. This reflects the gradual return of office workers following the lifting of working from home guidance.
- The share of shopping/personal business and leisure trips have both reduced from pandemic highs: the share of shopping trips so far in 2022/23 (April-September) was the same as the 2019/20 average (26 per cent), although the share of leisure trips remains eight percentage points higher than the pre-pandemic average, at 36 per cent.
- The share of other trips has fluctuated but is now almost in line with the pre-pandemic average (15 per cent compared to 17 per cent in 2019/20).

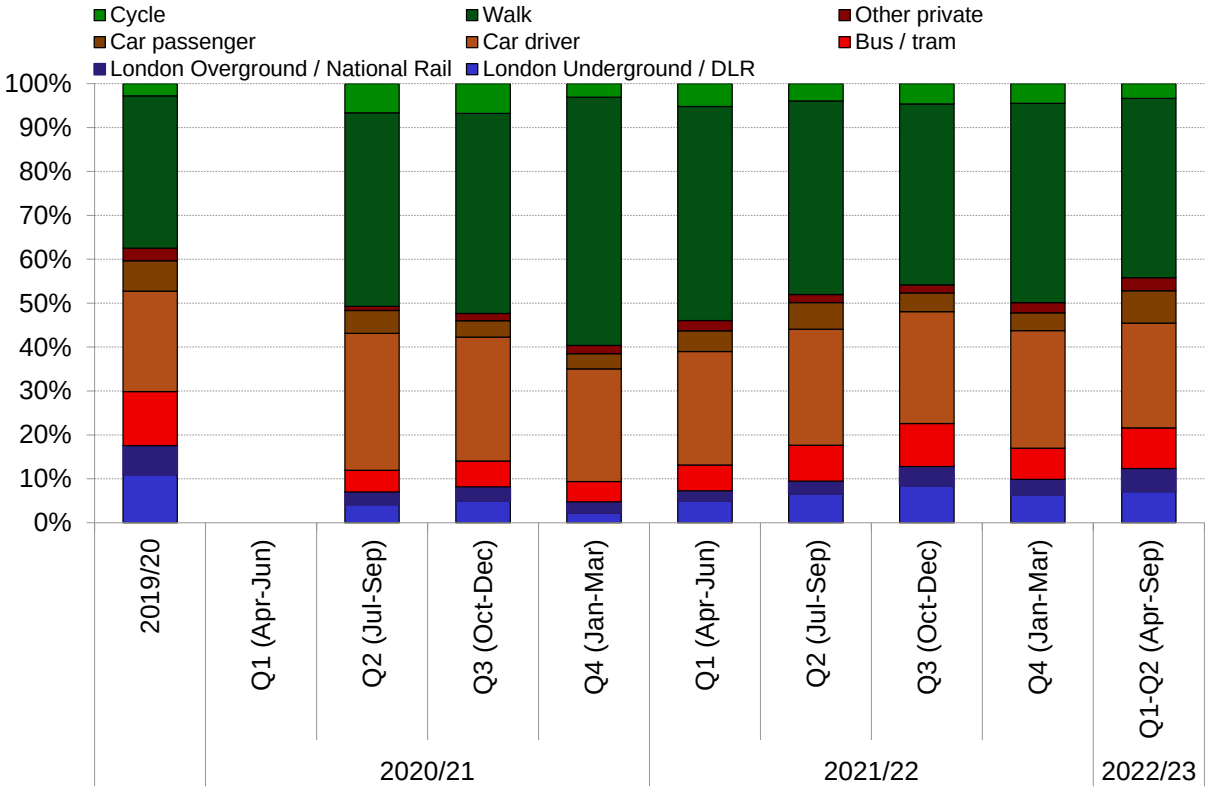
3.4 Mode shares for travel by London residents

Prior to the pandemic, most trips made by London residents were walking trips or car driver trips (35 and 23 per cent, respectively). The combined public transport mode share in 2019/20 was 30 per cent and the cycling mode share was three per cent.

During the pandemic (figure 3.3), the key features were a decrease in public transport mode share, an increase in the share of trips made by private modes as well as an increase in trips made by active modes.

This was a result of several factors, including pandemic restrictions on the reasons for which travel was permitted, the lower perceived risk of catching coronavirus when using private or active modes, and the shift to shorter, local trips which are more feasible than longer trips for walking and cycling.

Figure 3.3 Trip-based mode shares, London residents aged 17+, LTDS, 2019/20-2022/23.



Source: TfL City Planning.

The lowest combined public transport mode share was seen in quarter 4 2020/21 (January-March) at nine per cent, but this has recovered steadily since then, reaching 22 per cent in 2022/23 so far (April-September). This is lower than the pre-pandemic average and is likely driven by the higher rates of home and hybrid working that have persisted.

The car (driver and passenger) mode share was highest at the beginning of the pandemic in quarter 2 2020/21 (July-September), at 36 per cent, but has reduced over time to 31 per cent (one percentage point above the 2019/20 average).

Active travel mode shares increased considerably during the pandemic, from 37 per cent (combined) in 2019/20 to 60 per cent in quarter 4 2020/21 (January-March) at the height of the Omicron wave. Although the active travel mode share has since declined, to 44 per cent so far in 2022/23 (April-September), it remains seven percentage points higher than in 2019/20.

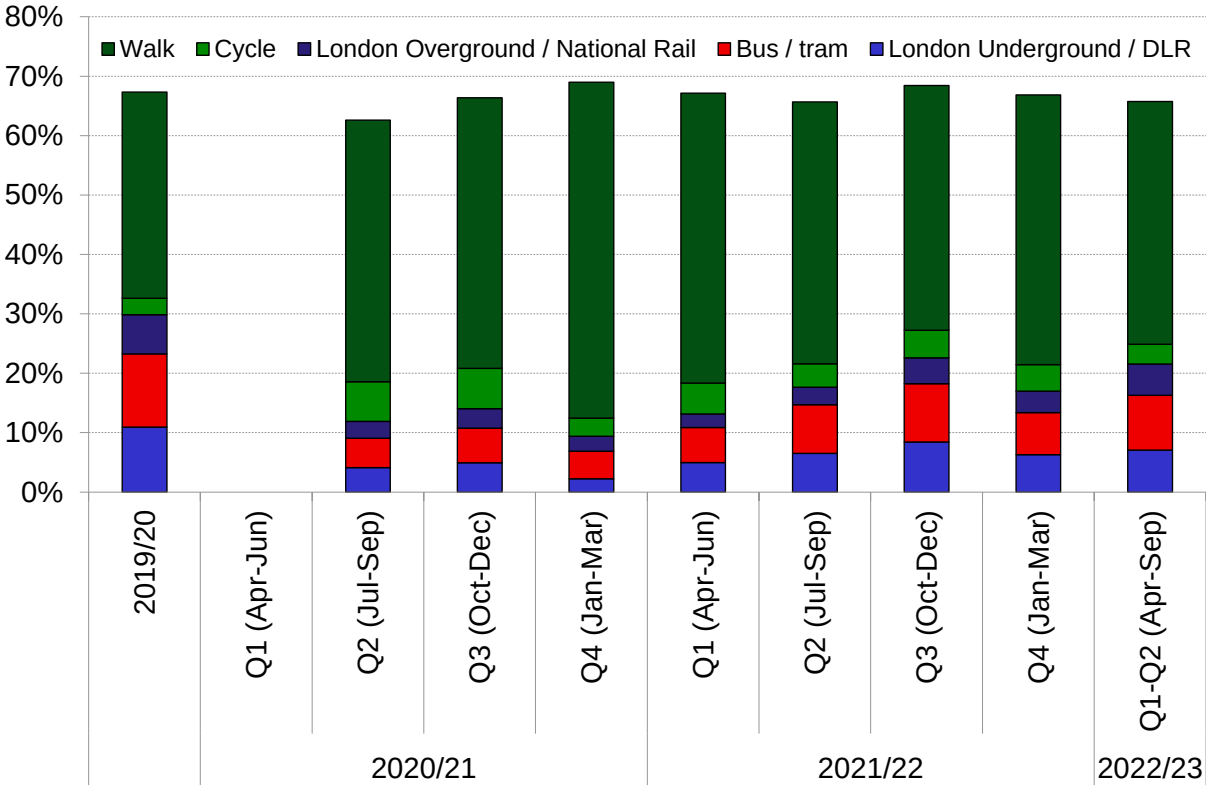
3.5 Active, efficient and sustainable mode shares

The proportion of London residents' trips made by active, efficient and sustainable modes (public transport, walking or cycling) has increased gradually over time, by 10 percentage points from 57 per cent in 2005/06 to 67 per cent in 2019/20.

This was mostly driven by consistent growth in public transport use (primarily rail) over the period, in addition to a gradual increase in cycling. Bus and walk mode shares were relatively more stable over the period.

Figure 3.4 shows the trend in active, efficient and sustainable mode share in 2019/20 and quarterly throughout the pandemic, including the latest data for 2022/23 so far (April-September).

Figure 3.4 Trip-based active, efficient and sustainable mode share, London residents aged 17+, LTDS 2019/20-2022/23.



Source: TfL City Planning.

Overall, the active, efficient and sustainable mode share has been relatively consistent over the period, fluctuating between 63 and 69 per cent (a few percentage points either side of the 2019/20 average).

Although public transport mode shares declined during the pandemic, this was compensated by an increase in the active travel mode share, meaning that the net impact on the active, efficient and sustainable mode share was relatively small.

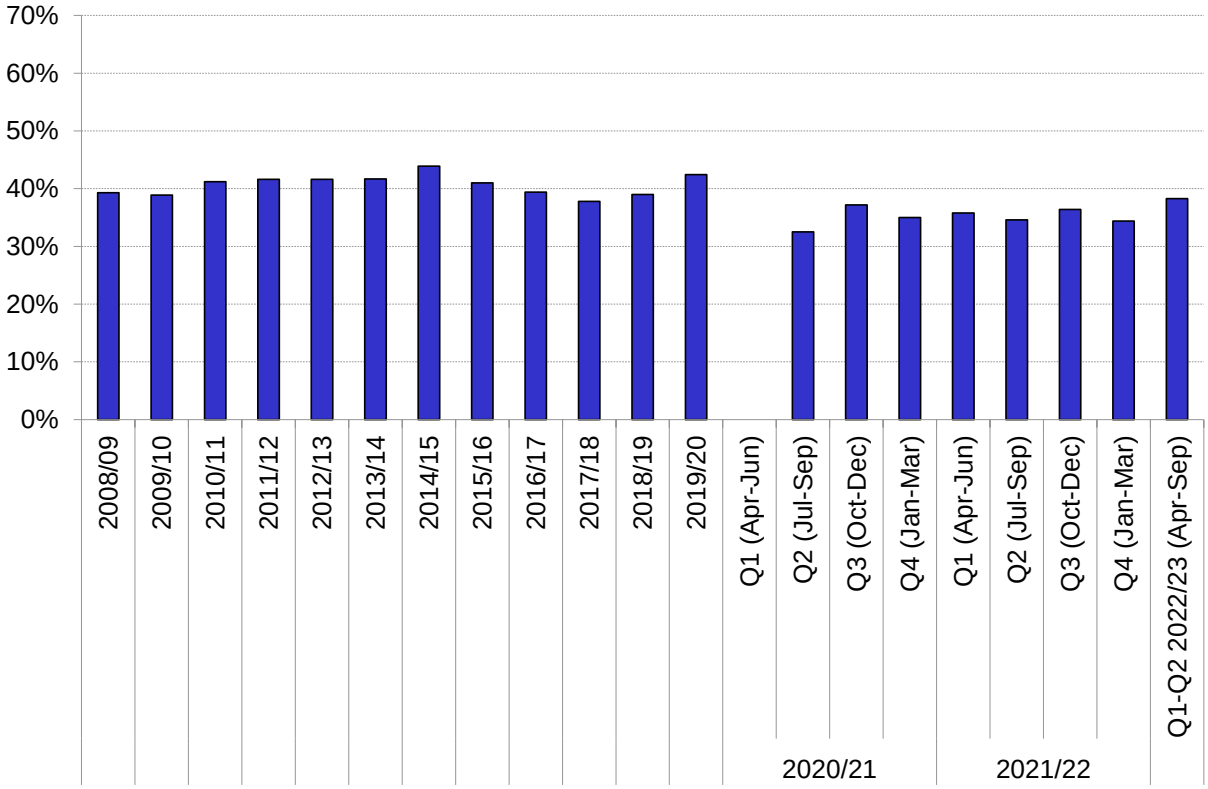
As public transport mode shares have increased in recent quarters, the active travel mode shares have declined slightly, resulting in a value of 66 per cent in 2022/23 so far (April-September), only two percentage points below the 2019/20 average.

3.6 Travel and physical activity

The Mayor's active travel target is for all Londoners to achieve at least 20 minutes of active travel (defined as either walking or cycling) per day by 2041. The LTDS offers the best available data source on active travel in London, giving a daily snapshot of travel behaviour by London residents.

The historic trend prior to the pandemic was relatively stable, with the proportion of Londoners achieving at least 20 minutes of active travel per day fluctuating at around 40 per cent up to 2019/20 (figure 3.5).

Figure 3.5 Proportion of London residents aged 20+ who achieve at least 20 minutes of active travel per day, LTDS, 2008/09-2022/23.



Source: TfL City Planning.

Figure 3.5 also shows that the estimates from 2020/21 and 2021/22 suggest that the proportion of Londoners achieving the target was lower during the pandemic, with quarterly values in both years at around 35 per cent, compared to 42 per cent in 2019/20.

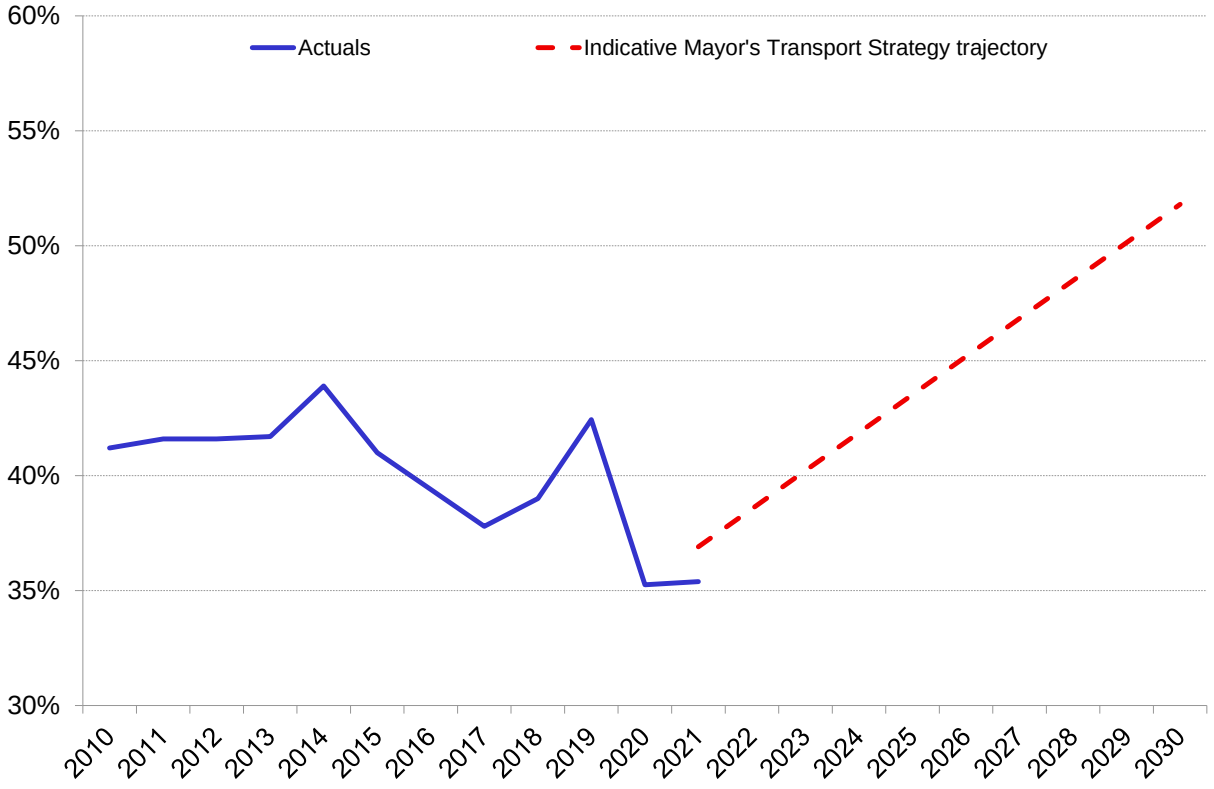
In the latest available data (April-September 2022), the value was 38.3 per cent. This higher rate is most likely related to overall higher levels of travel and an increase in public transport use, since almost all journeys by public transport including at least one walk stage.

Although lockdown restrictions gave London residents greater opportunity to partake in active travel more locally, in practice this was countered by general restrictions on mobility, resulting in many fewer (and shorter) trips being made per day compared to before the pandemic.

Another main contributory factor to lower overall achievement of 20 minutes of active travel during the pandemic was the reduction in walking (and to some extent cycling) as part of the journey to work among those working from home.

Figure 3.6 shows the Mayor's active travel ambition in the historic context.

Figure 3.6 Proportion of London residents aged 20+ who achieve at least 20 minutes of active travel per day, LTDS, 2010-2030.



Source: TfL City Planning.
Note: Actuals are calculated on a financial year basis. For example, 2013 on the graph refers to 2013/14.

3.7 Remote and hybrid working

Previous Travel in London reports covering the pre-pandemic period suggested an increasing tendency for office-based workers to work from home on some days, although the available quantitative evidence for this from our LTDS survey was not particularly strong at the time.

As a widely acknowledged potential lasting legacy from the pandemic, it is of interest to review the most recent data on this aspect of travel.

Remote and hybrid working during the pandemic

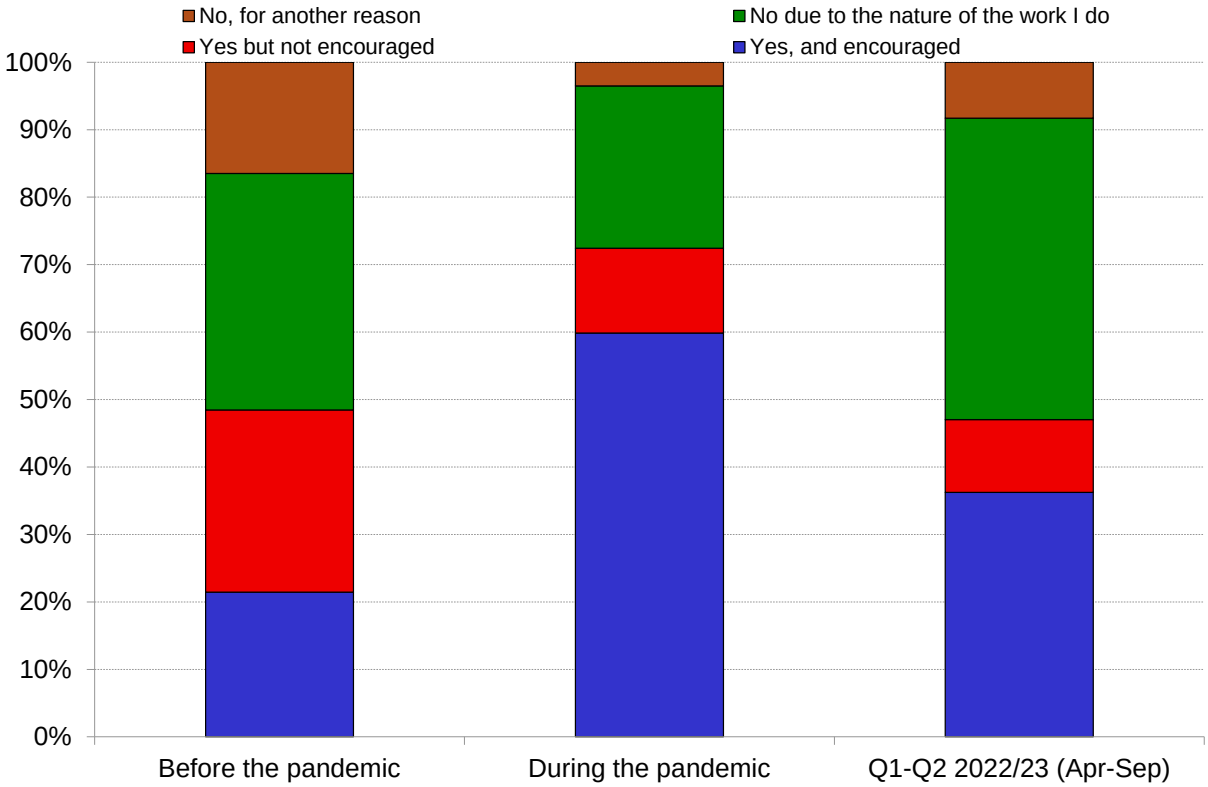
The imperative to work from home changed with different stages of the pandemic and was one of the most prominent pandemic adaptations affecting Londoners' travel behaviour, despite it being an option available only to some.

Although at the time of writing Government advice to work from home has not been in place for more than a year, the scale of change and length of time it had to become embedded present obvious challenges for the recovery of pre-pandemic

commuter travel, and it is generally expected that higher levels of home working will persist in the medium to long term.

Figure 3.7 shows the latest (provisional) working from home trends from the LTDS for London residents, relating to the first half of 2022/23, compared to the pandemic and pre-pandemic situation.

Figure 3.7 Ability of London resident workers to work from home, LTDS, 2021/22-2022/23.



Source: TfL City Planning.

The graph suggests that:

- Before the pandemic, just less than half of London resident workers (48 per cent) were able to work from home, although only 21 per cent of workers were encouraged to do so. Just more than half of workers (52 per cent) were not able to work from home, either due to the nature of the work they were doing (35 per cent) or for other reasons (16 per cent).
- During the pandemic, the proportion of London resident workers who were encouraged to work from home increased from 21 per cent to 60 per cent, with a further 13 per cent able to work from home, although it was not necessarily encouraged. This was a 24 percentage point increase in the share of workers who were able to work from home. The proportion who were not able to work from home decreased from 52 per cent to 28 per cent.
- The latest (provisional) LTDS data (April-September 2022) suggests that the proportion of resident workers who are able to work from home has returned to similar levels seen before the pandemic. However, the share who say they are encouraged to work from home is notably higher than it was before the pandemic (at 36 per cent compared to 21 per cent).

- On the other hand, the proportion of workers who say they cannot work from home due to the nature of the work they do has increased compared to the pre-pandemic position (45 per cent compared to 35 per cent). The share of workers who say they cannot work from home for other reasons has decreased from 16 per cent before the pandemic to eight per cent.
- Of the people who said they are able to work from home in the first half of 2022/23 (April-September), more than one in four (26 per cent) said their employer expects them to attend their workplace between one and two days per week, 18 per cent said three to four days per week, six per cent said five days per week and half (50 per cent) said the number of days is flexible.

Further data is required to understand the extent to which these important trends stabilise as the recovery progresses.

3.8 Focus on: switchable trips

Introduction

Some trips that are currently made by car could theoretically be made by other more sustainable modes to move towards achieving the Mayor's mode share target. This section sets out a revised approach to quantifying and characterising these trips, building on earlier analysis described in Travel in London report 11.

The analysis in this section describes the use of a new activity-based modelling approach developed by TfL using data gathered through the London Travel Demand Survey (LTDS), which will also be of more general interest.

Overview of method

The analysis of trips currently made by sustainable modes gives information on the characteristics of the trips and the people who make them. In theory, trips with these same characteristics but not made by a sustainable mode could potentially be switched to a sustainable mode.

The likelihood of this can be considered to depend on the availability and suitability of alternatives and the propensity of the trip maker to choose them, both of which can be quantified through an activity-based model.

However, while the journeys could theoretically be made by another mode, the alternatives may not be appealing or suitable for the trip-maker for reasons not identified in this analysis and therefore they may not be prepared to switch.

The activity-based model approach allows a much wider range of variables to be considered in assessing likelihood to switch and provides an efficient way of calculating the response to different transport policy scenarios in terms of switching car trips to more sustainable modes.

Activity-based modelling

The Activity-Based Model (ABM) takes as inputs the population of London and works out their travel plans for the day for a year of interest.

The LTDS is used to quantify the various travel behaviours in the model, including synthesising the population of London.

The outputs from the model look very similar to a typical trip table of a household travel diary survey. In this way, the ABM outputs could be considered as a synthetic extension of the observed data collected through the LTDS.

The process first divides the population into those not travelling for the day (non-travellers) and those making at least one trip outside home (travellers).

For travellers, the ABM can represent the number and types of activities they will be participating in outside the home and determine where these activities are, both inside and outside London (in the form of a trip chain). The time at which trips are made and the time spent doing the activity are derived from information in the LTDS, as is the mode currently used for the trip.

Our ability to represent activities and the travel associated with them at the individual level in the context of behavioural responses and a network model means TfL now has the means to develop almost unlimited insights and information about London residents and their travel behaviour.

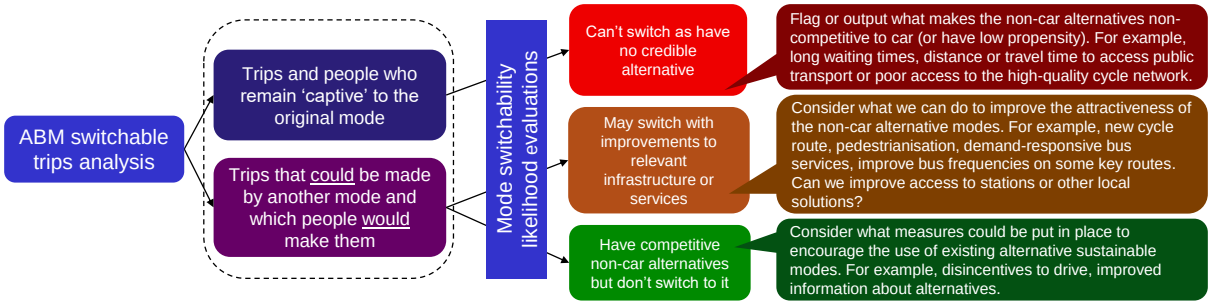
This opens up the opportunity to model and more accurately forecast behaviour and test policies that were once difficult to assess through conventional models. This includes the switchable trips analysis described below but also, for example, policies related to fares or charges, land-use policies or emerging transport business models (for example Mobility as a Service).

In terms of switchable trips, and as an example of the application of this approach, TfL can identify the likelihood of London residents' car trips to be shifted to sustainable modes (bus, rail, walk, cycle), and to quantify this likelihood.

It also allows us to identify parts of the transport networks that constrain the use of sustainable modes, and to develop policies that maximise the 'switchability likelihood' and minimise any associated disbenefits.

Figure 3.8 summarises the main elements of this approach.

Figure 3.8 Main elements of the activity-based model approach to identify trips that could be made by other modes.



Source: TfL City Planning.

Defining the likelihood to switch

The likelihood of a trip to switch mode depends on both the characteristics of the trip and the person making it.

Trip characteristic variables include:

- Accessibility factors, such as the length of the trip, travel time by the different modes, waiting and walking (access and egress time) for public transport, and network conditions such as measures of crowding.
- Other network factors such as the trip origin and destination locations, the availability of alternatives for the trip and the time of day.
- Trip purpose, which has strong modal and geographical associations.

Personal characteristic variables include:

- Car ownership and availability, income, gender, disability and whether or not heavy items are being transported.
- Life stage, such as age and family circumstances.

These are combined to give the overall likelihood to switch, represented by a 'switchability likelihood' metric, as illustrated in figure 3.9.

Figure 3.9 Calculation of the switchability likelihood score.

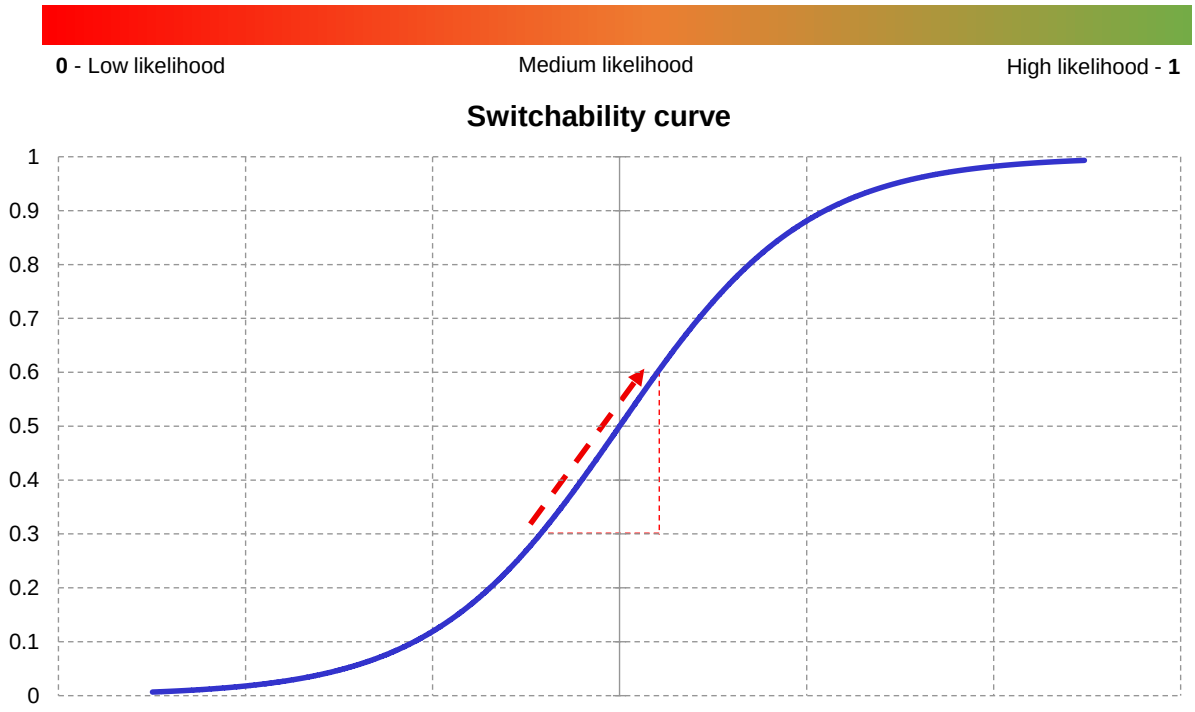
Source: TfL City Planning.

The switchability likelihood metric is a continuous non-linear scale between zero and one with values closer to zero meaning that the trip has a lower likelihood to switch and values closer to one a higher likelihood.

The metric therefore gives a quantitative estimate across all trips of the likelihood of that trip switching to all other modes (individually).

The general nature of the switchability likelihood metric is shown by figure 3.10.

Figure 3.10 Statistical properties of the switchability likelihood curve.



Source: TfL City Planning.

As a general summary and considering the likelihood of trips to switch to public transport:

- Trips with values less than 0.3 have a low likelihood to switch, so minor improvements in public transport may not be enough for people making these trips to switch modes.
- Trips with values between 0.3 and 0.6 have a good likelihood to switch with only minor improvements in public transport.
- Those with values greater than 0.6 already have good public transport access so changes in provision may have only minor impacts on mode switch.

An example of switchability analysis: car trips

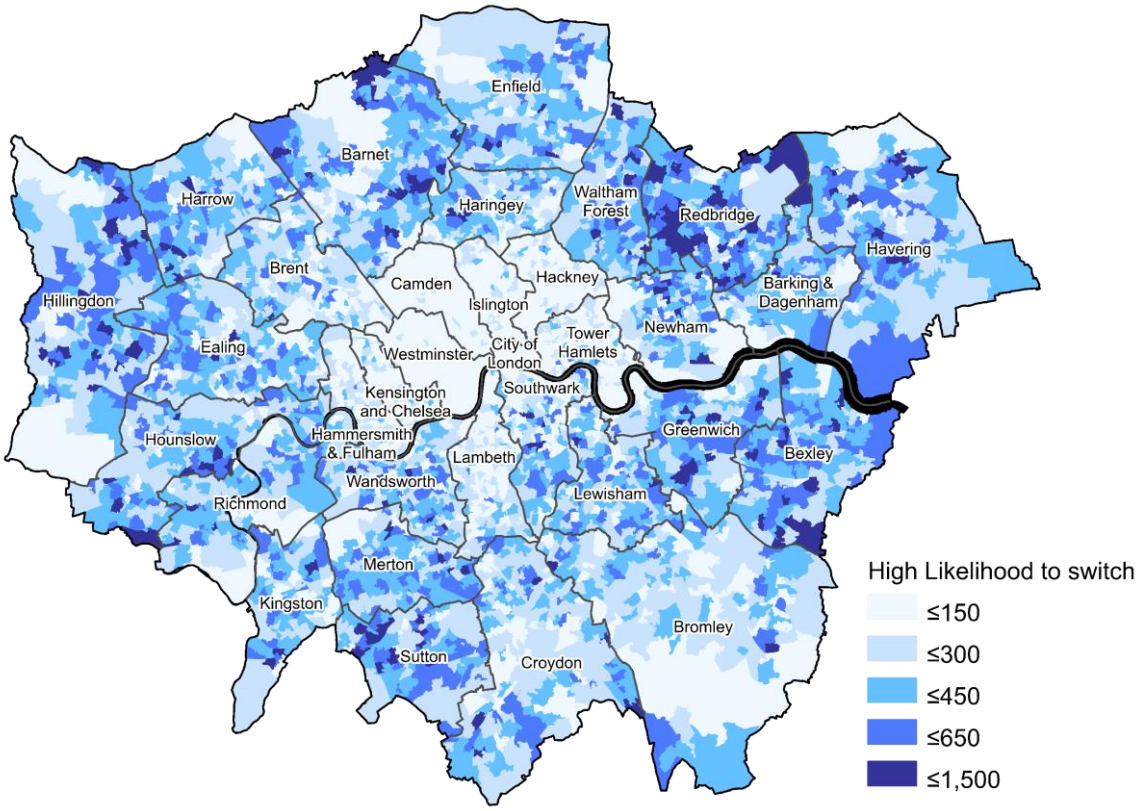
Figures 3.11 and 3.12 show the spatial distribution of car trips with a high and low likelihood to switch to a sustainable mode in 2026 for each Lower layer Super Output Area across London.

Low is classified as having a likelihood to switch between 0.0 and 0.3, high is for likelihood between 0.6 and 1.0.

The darker the colours, the more trips that could be switched to a sustainable mode in those areas.

Areas with higher numbers of car trips with a high likelihood to switch to sustainable modes include areas in the east such as Redbridge, Waltham Forest, Greenwich and Bexley (figure 3.11).

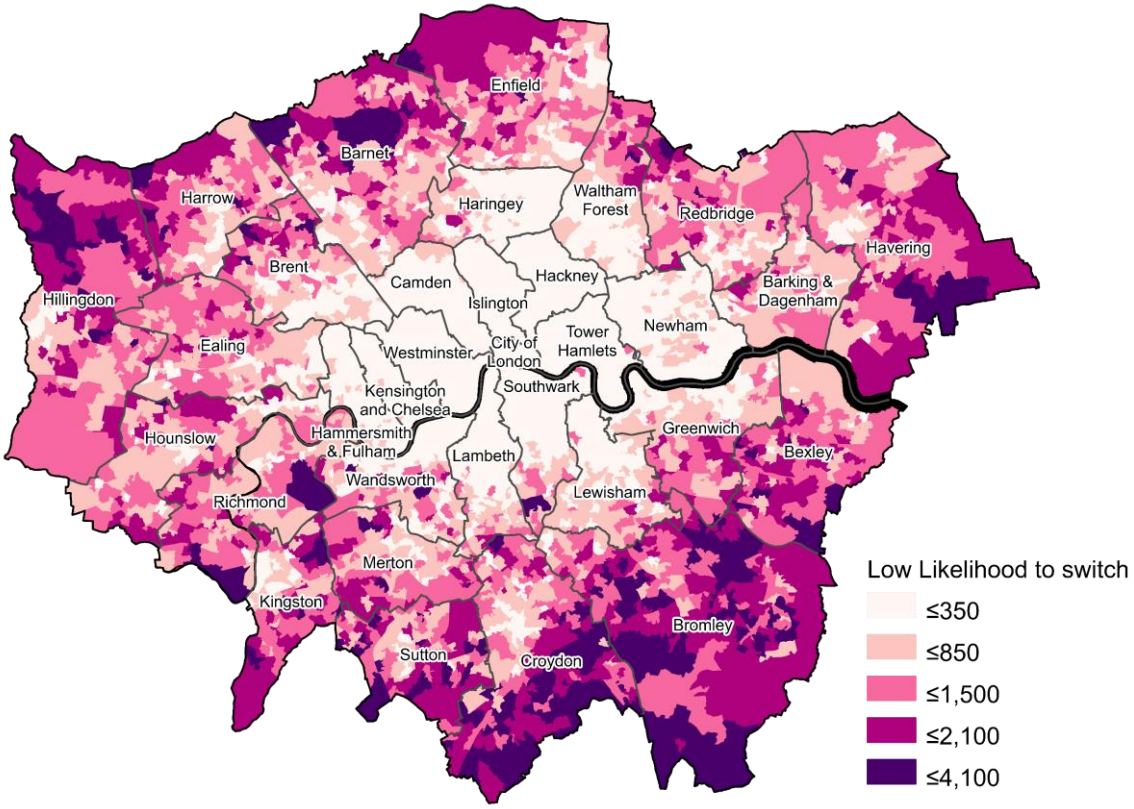
Figure 3.11 Spatial distribution of car trips with high likelihood to switch from car to a sustainable mode by Lower layer Super Output Area, 2026.



Source: TfL City Planning.

Areas with higher numbers of car trips with a low likelihood to switch to sustainable modes include areas in outer London such as Bromley, Croydon, Havering, Barnet and Enfield (figure 3.12).

Figure 3.12 Spatial distribution of car trips with low likelihood to switch from car to a sustainable mode, by Lower layer Super Output Area, 2026.



Source: TfL City Planning.

Quantifying overall switchability

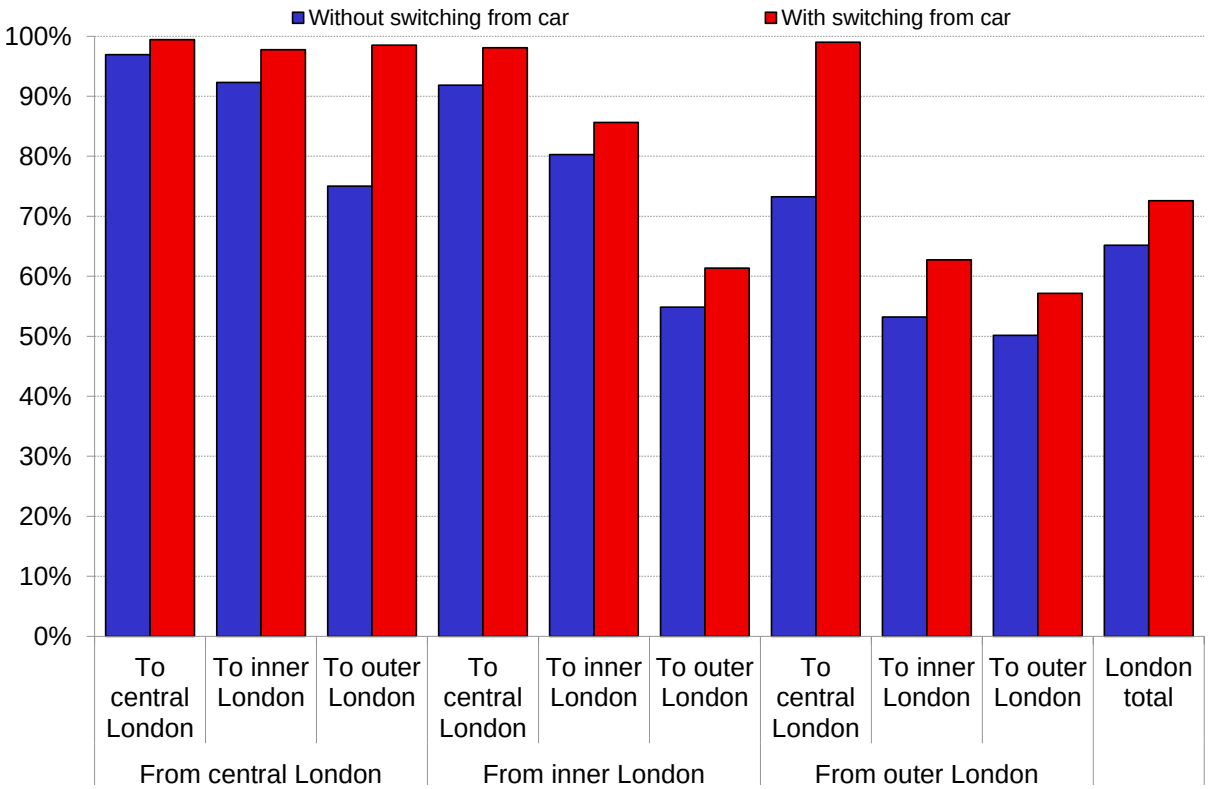
In 2026, the ABM forecasts about 6.5 million daily car trips in London. Taking a switchability threshold of between 0.6 and 1.0, it is estimated that 1.4 million trips (21 per cent) have a high likelihood of switching to sustainable modes, taking 2026 as an example year.

This scope is shown by figure 3.13, where the proportion of trips by sustainable modes in 2026 without car trips switching is compared to the sustainable mode share if all the trips with a high likelihood to switch from car were switched to sustainable modes.

Central London is defined as the Congestion Charge zone; inner London is the area outside this and within the North and South Circular Roads and outer London the area outside this and within the Greater London Authority boundary.

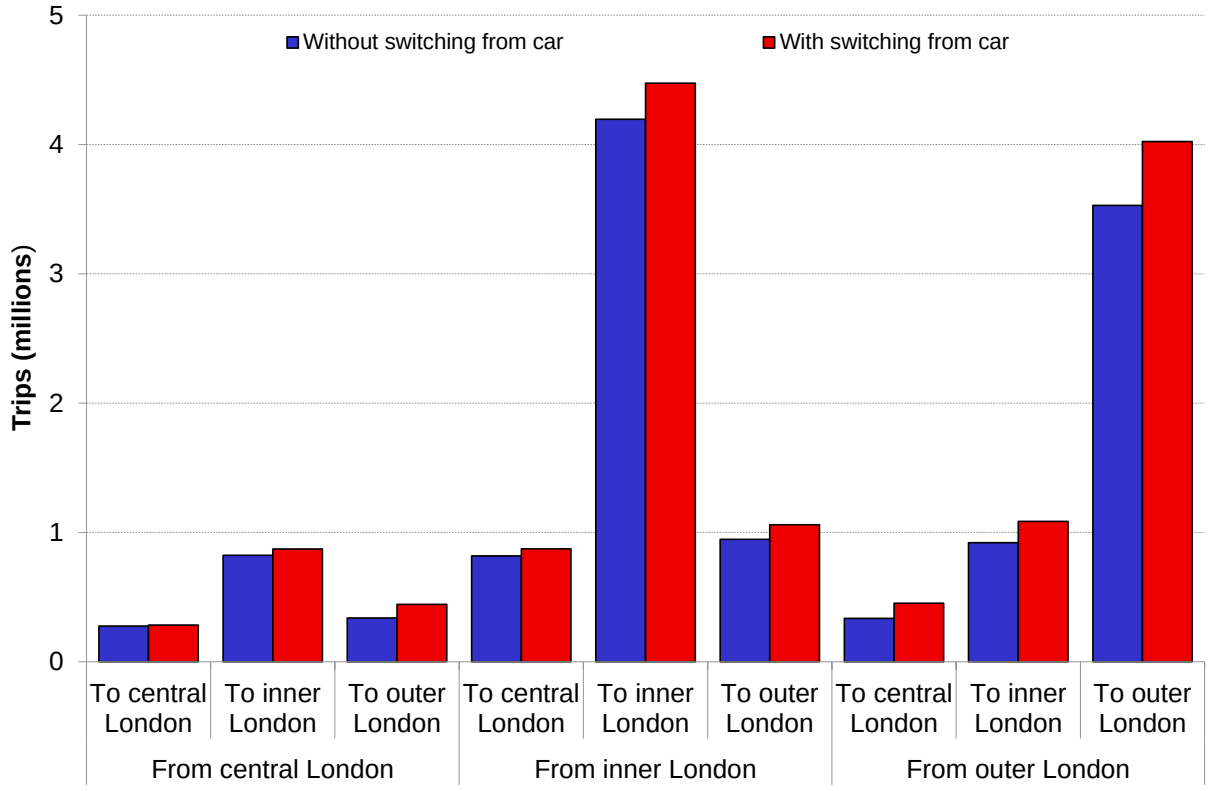
Note that, while there is potential to increase the sustainable mode share for trips from central to outer London from 75 to 99 per cent (an increase of 24 percentage points) this represents 106,000 trips, as shown on figure 3.14. Conversely, trips starting and ending in outer London show an increase of only seven percentage points in sustainable mode share, but this represents more than 490,000 trips.

Figure 3.13 Proportion of trips by sustainable modes, by movement between central, inner and outer London, 2026.



Source: TfL City Planning.

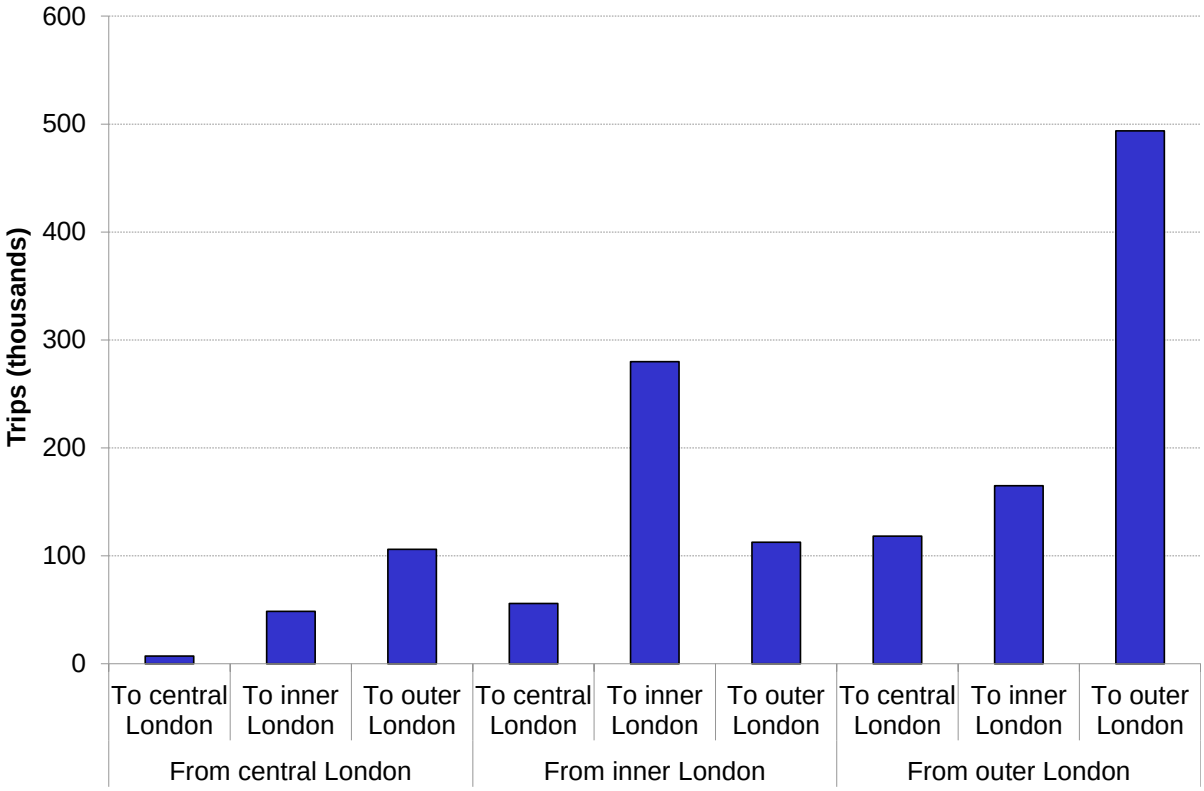
Figure 3.14 Trips by sustainable modes, by movement between central, inner and outer London, 2026.



Source: TfL City Planning.

Figure 3.15 categorises these car trips with a high likelihood to switch according to the area of London where the trips start and finish.

Figure 3.15 Car trips with a high likelihood to switch to a sustainable mode, by movement between central, inner and outer London, 2026.



Source: TfL City Planning.

The largest number of residents' car trips that could be made by sustainable modes have both their origin and destination in outer London, numbering about 494,000 daily trips. While this is the highest number of trips by area, it still only represents 14 per cent of car trips with both an origin and destination in outer London.

Some 280,000 car trips with an origin and destination in inner London have a high likelihood to switch to sustainable modes. This represents 27 per cent of trips with their origin and destination in inner London.

London residents' car trips with both their origin or destination in central London show the lowest numbers of trips with a high likelihood to switch to sustainable modes, since the existing public transport and cycling networks in central London already meet Londoners' needs well and other issues such as congestion, parking constraints and charging schemes reduce demand for car trips.

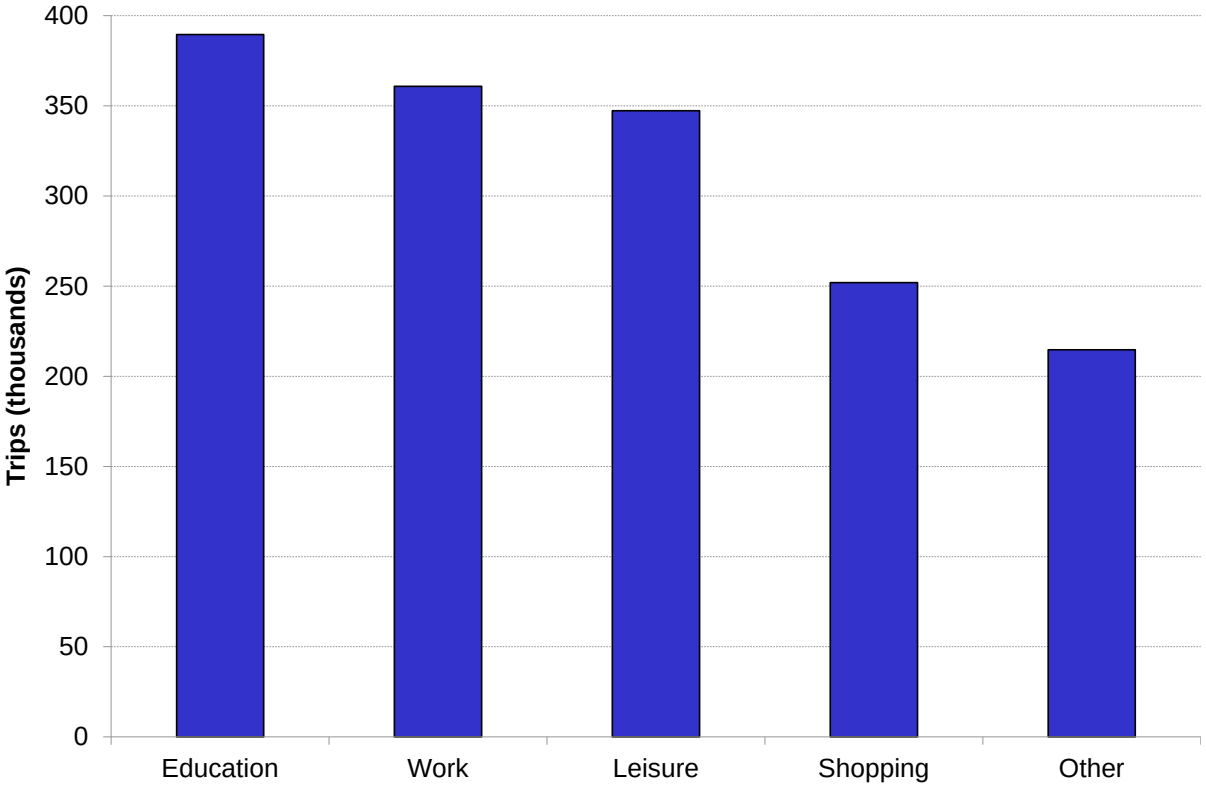
The number of car trips with a high likelihood to switch travelling to or from central London from or to inner or outer London are lower than those entirely within inner or entirely within outer London.

The public transport mode share to and from central London is already high, enabled by the good public transport and cycling connections. Therefore, the few car trips there either may not be suitable to switch or they would already have done so.

The orbital connections within inner and within outer London are not so well developed as the radial networks to central London, hence the lower number of trips with a high likelihood to switch.

The data can also be categorised by the activity purpose of the trip (figure 3.16).

Figure 3.16 Car trips with a high likelihood to switch to a sustainable mode, by activity type, 2026.



Source: TfL City Planning.

The purpose with the highest number of trips with a high likelihood to switch to a sustainable mode is education with 390,000 trips, a quarter of the overall total.

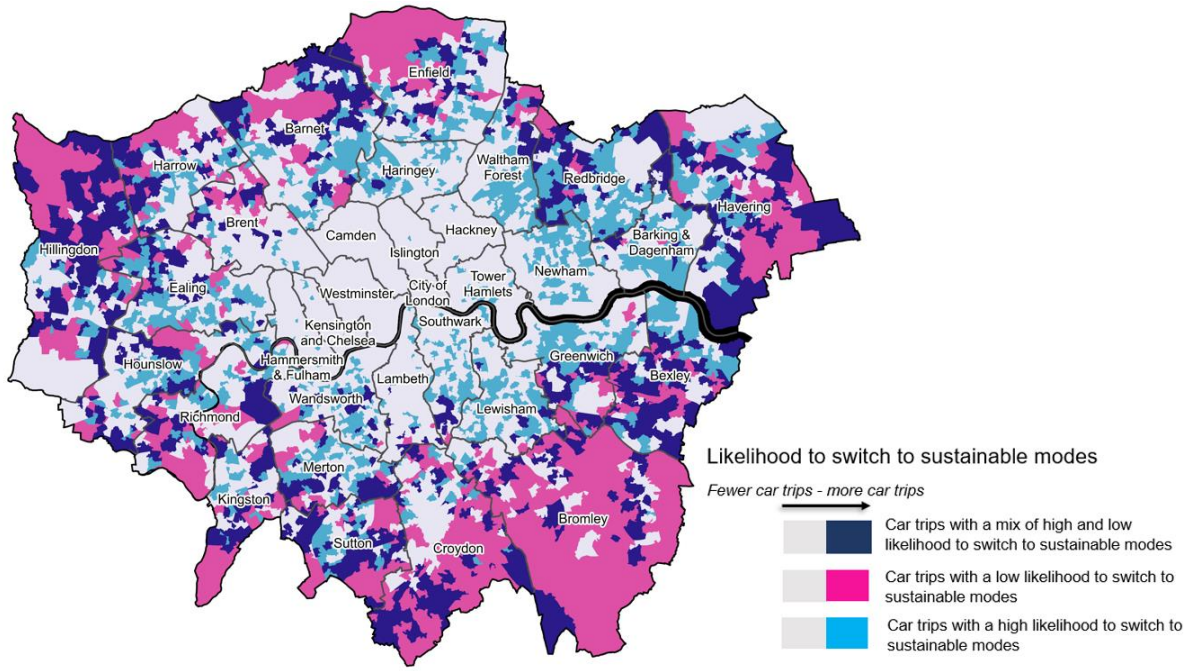
Note that trips by car for education include both those by car driver and car passenger and both for their own education and for escorting someone to education. Therefore, a car trip with both a parent and child in the same car counts as two trips.

Trips for work and leisure are only slightly lower with 361,000 and 347,000 respectively. Work trips include both commuting and trips made to other work locations such as attending meetings and visiting clients' premises.

Spatial distribution of switchable trips

Figure 3.17 shows the likelihood of all residents' car trips switching to any sustainable mode of travel for a forecast year of 2026. Areas where trips have a high likelihood of switching to sustainable modes are shown in light blue and areas where the likelihood is low are shown in pink.

Figure 3.17 Scope for car trips to be made by a sustainable mode and spatial distribution of home locations of trip makers in 2026.



Source: TfL City Planning.

The map shows that areas with a high number of car trips with a mix of high and low likelihood to switch to sustainable modes tend to be located in outer London and close to the London boundary, for example in Hillingdon, Barnet, Havering, Bromley and Croydon (dark blue areas).

In outer London there are high numbers of car trips with a low likelihood to switch to sustainable modes (pink-shaded areas). This is because significant improvements to the networks or their operations in those areas would be required to unlock mode shift.

Areas with high numbers of car trips with a high likelihood to switch to sustainable modes are located mostly in northeast and southeast London, in boroughs such as Waltham Forest, Redbridge, Newham, Barking & Dagenham and also Southwark, Lewisham and Greenwich (light blue areas). However, there are also some such areas in north, west and southwest outer London.

Although there are already good-quality public transport alternatives available in many of these light blue areas, car is still the preferred option to travel. There may be more factors affecting the ability to shift modes that are not included in this analysis.

If the barriers to switching to walking are attitudinal, they could be addressed with other behavioural change techniques or with information campaigns about public transport or disincentives to drive.

Central London and most of the inner London region are shown in pale grey on the map, indicating fewer switchable car trips and reasonably good sustainable alternatives.

Conclusion

TfL has developed an activity-based modelling capability which opens many new avenues for policy appraisal and analysis.

One application is determining the modal ‘switchability’ of trips currently made by London residents in London in relation to the Mayor’s aim for 80 per cent of trips to be made by active, efficient and sustainable modes by 2041.

This analysis shows that, considering a 2026 forecast year, some 21 per cent of London residents’ car trips could be assessed to have a high likelihood, with appropriate incentives, of switching from car to active, efficient and sustainable modes. This would bring the percentage of trips made by active, efficient and sustainable modes to 73 per cent.

The highest number of car trips with a high likelihood to switch from car are those trips that have both their origin and destination within outer London, followed by trips with both their origin and destination within inner London.

Car trips for education have the highest number of trips with a high likelihood to switch followed by trips for work.

Section 2: Healthy Streets and healthy people

4. Healthy travel

4.1 Introduction

The pandemic presented both challenges and opportunities for increasing active travel in London.

In terms of challenges, mobility in general was restricted and for lengthy periods of formal lockdown only short-distance trips for specific purposes, for example daily exercise, were permitted by law.

Although these trips and social distancing considerations favoured active modes such as walking and cycling, the scope for travel was much reduced. For example, former lengthy commuter cycling trips were curtailed by working from home guidance, and often replaced by shorter-distance local leisure cycling. There was also markedly less walking as part of longer public transport trips, for example the daily walk to and from the station.

In terms of opportunities, however, the pandemic offered many avenues to embed behaviours favourable to the Mayor's aims for the longer term.

The Streetspace for London programme took advantage of necessary pandemic adaptations to create spaces conducive to walking and cycling, and it was hoped that the opportunity presented to many to get out and about locally, on foot or by bike, combined with spells of particularly fine weather, would encourage these activities to continue following the removal of pandemic restrictions.

A further dimension was the necessity to focus on local facilities to fulfil essential daily needs such as shopping, any longer-term trend towards such localism being likely to preferentially feature short-distance trips on foot or by bike and contribute to the revitalisation of local town centres.

Although the pandemic itself restricted our ability to collect good data for cycling and particularly walking, our best estimates, bearing seasonal factors and lockdown impacts in mind, suggest a resilient performance for these modes and the potential for a positive pandemic legacy.

4.2 Cycling trends in London

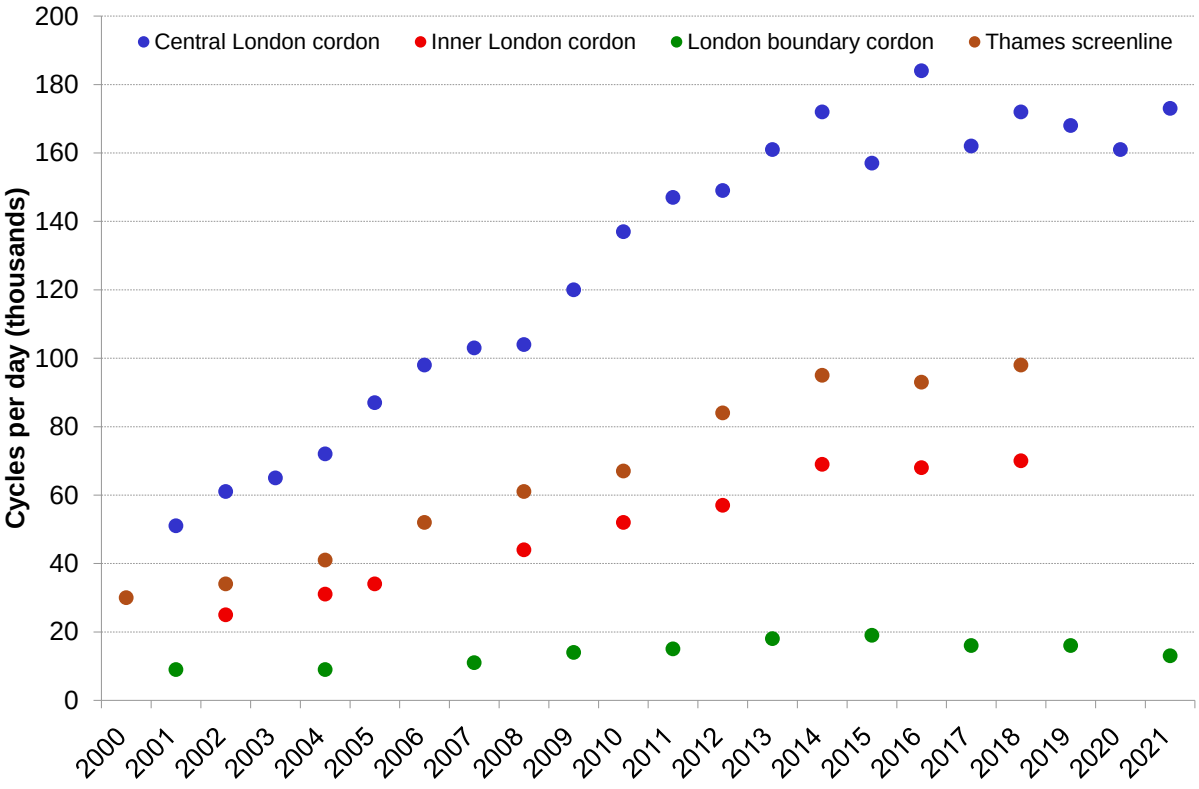
Cycling demand estimates: pandemic recovery in the longer-term context

The story of cycling in London over the last two decades is one of strong growth throughout the 2000s and first half of the 2010s (particularly for journeys starting or ending in central London) followed by a reduction in the rate of growth from around 2015 and until the outbreak of the pandemic.

This change of trend probably reflected the general slowing of growth in travel over this period, as well as diminishing returns effects in the next phase of unlocking cycling potential after the initial rapid gains (mostly related to radial commuter travel).

These long-term trends are illustrated by our annual and biennial cycle counts across the central London, inner London and London boundary cordons and the Thames screenline (figure 4.1).

Figure 4.1 Cycle flows across strategic cordons, 2000-2021.



Source: TfL traffic data.
Note: The 2020 counts at the inner cordon and Thames screenline were cancelled due to the pandemic restrictions.

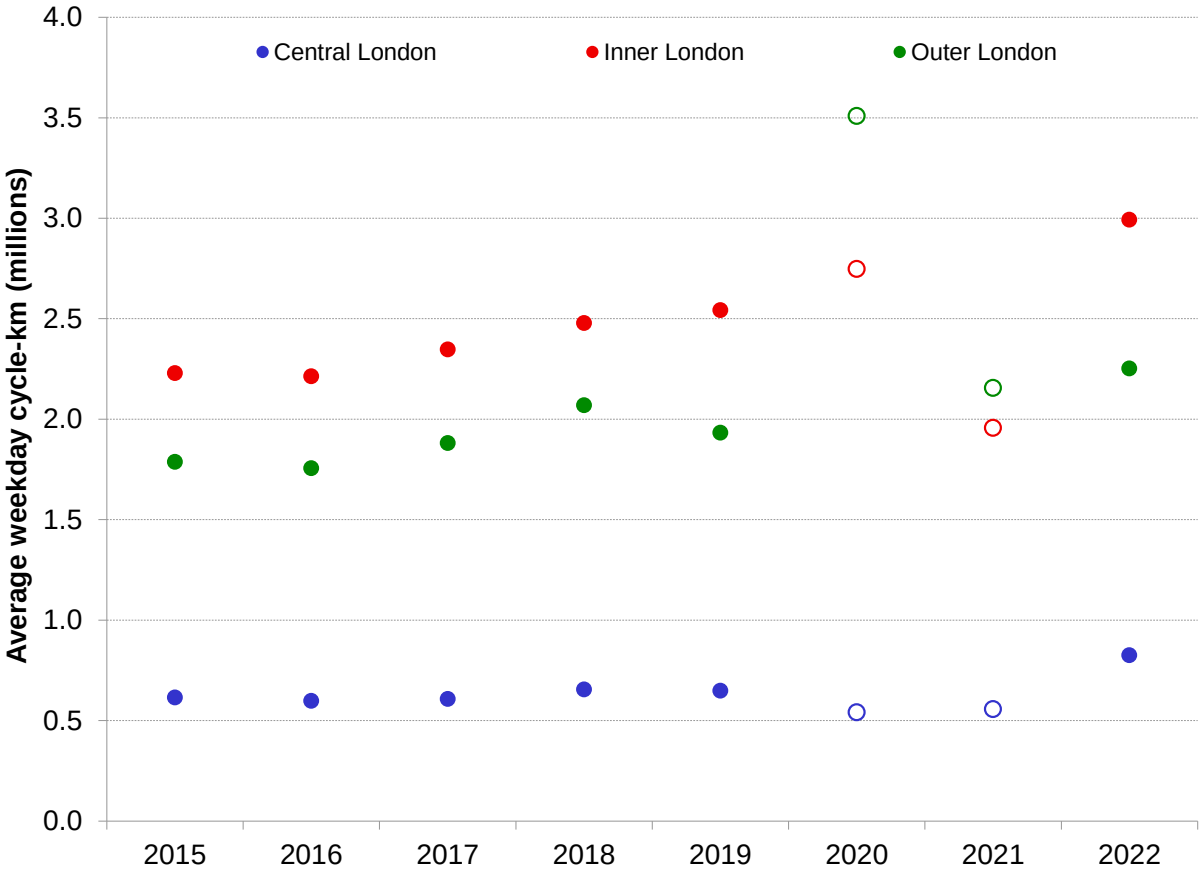
Overall cycling volumes in London

The estimates of cordon crossings above are spatially specific. However, our best estimates of cycling volumes in London (in terms of average weekday kilometres cycled) arise from a programme of area-based counts which covers central (Congestion Charge zone), inner and outer London more comprehensively and representatively. These counts started in 2015, and therefore can only be used to explore more recent trends.

Over the last few months and motivated by the challenges in data collection brought about by the pandemic, a thorough revision of these estimates and the way they are computed has been undertaken. This has led to some changes and simplifications in the methodology which, for consistency, have been retrospectively applied, producing a revised historic series.

Figure 4.2 shows the revised estimates of weekday cycle kilometres by area. The first thing to note is a step change in the absolute cycling volumes compared to previous estimates. This is caused by the methodology change and does not represent genuine growth, so that for a correct interpretation it is key to focus on relative changes, which the revision has largely left unaffected.

Figure 4.2 Weekday cycling volumes (cycle-km) by area, 2015-2022.



Source: TfL City Planning.
Note: Due to the various lockdown restrictions and the unprecedented volatility of cycling demand within the year, the 2020 and 2021 estimates are not necessarily representative of that year as a whole.

As reflected by the longer-term cordon counts (figure 4.1), figure 4.2 shows a slower pace of growth in cycling in the years just before the pandemic. For example, between 2015 and 2019, weekday cycle kilometres in London increased by 11 per cent overall (6 per cent in central, 14 per cent in inner and 8 per cent in outer).

During the pandemic years of 2020 and 2021, cycling in London, like all other travel, underwent a lot of change, with substantial shifts in the purpose, location and timing of cycle trips.

In terms of cycling volumes, 2020 on the whole saw a large increase in cycling while 2021 saw a reduction from that historic high point, although the magnitude of these changes is indicative owing to restrictions on data collection and travel behaviour during the pandemic.

In particular, there is evidence that the 2021 estimates are not representative of the year as a whole because they show levels of cycling below the 2019 pre-pandemic baseline which are inconsistent with other datasets (such as the Department for Transport and Office for National Statistics estimates for London) and because it is known that the timing of the 2021 counts coincided with a period of lower cycling demand that was not the norm at other times of the year. A more granular indication of trends during the pandemic is given by figure 4.3 below.

However, what is clear from the 2022 counts (undertaken in spring following the removal of most pandemic restrictions) is that the pandemic was associated with a

net step increase in cycling, with 18 per cent more kilometres cycled on weekdays across London than in 2019 before the pandemic (equivalent to up to 27 per cent more in central London, 18 per cent in inner and 16 per cent in outer).

There is also evidence of a return to pre-pandemic trends in the timing of cycling trips (largely concentrated around a morning and an evening peak) and in their spatial distribution, with central London showing the highest kilometres cycled per kilometre of road. However, it is important to stress that these indicators capture only weekday cycling, since these counts are not conducted at weekends.

For a seven-day average indicator of cycling volumes it is possible to use an estimated number of cycle trips and stages calculated from the area-based counts programme and corresponding cycle kilometre estimates with adjustments for weekend travel derived from our London Travel Demand Survey (LTDS).

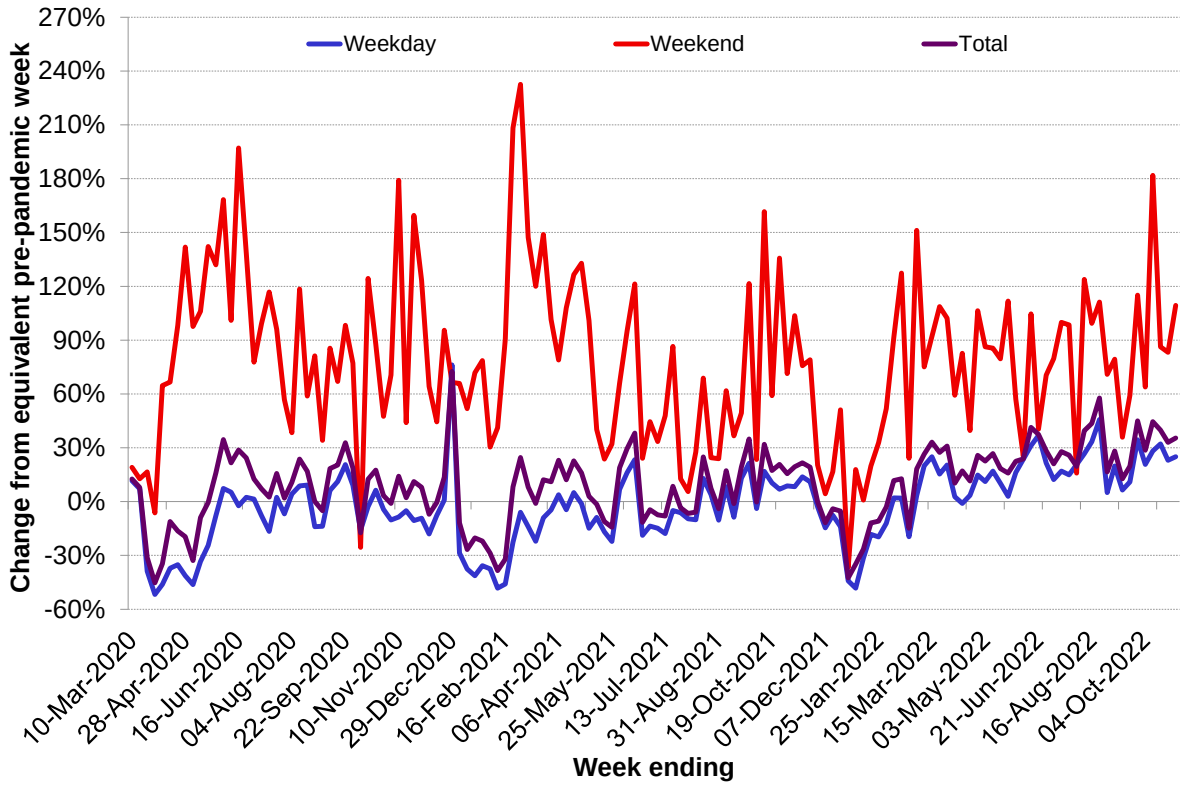
The headline result is a 14 per cent increase in the number of trips across London from 2019 to 2022, which represents an equivalent 13 per cent increase in stages.

Cycling and the coronavirus pandemic

Cycling proved to be remarkably resilient during the pandemic, offering many advantages for local, contact-free travel.

Figure 4.3, which is based on a small sample of continuous counting sites, located mostly in central and inner London, shows weekday cycling volumes close to the pre-pandemic baseline, despite a dramatic fall in commuter cycling, especially during the periods of formal lockdown. Striking also are the weekend volumes, almost twice as high as the pre-pandemic averages for much of the period.

Figure 4.3 Cycle flow at automatic cycle counters, Mar 2020-Sep 2022 vs 2019.



Source: TfL traffic data.

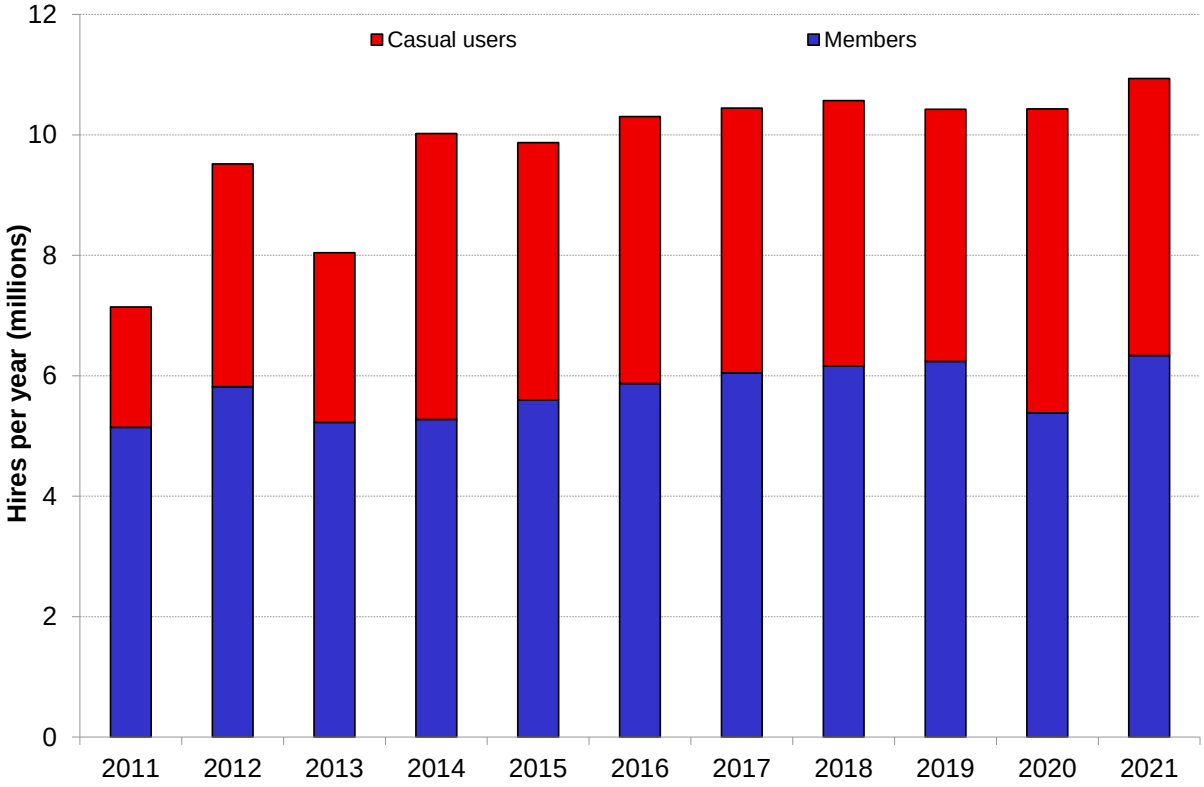
During the latter months of 2022 some of these patterns are persisting with the more general return to normal activities, albeit in the context of fine weather and other factors affecting the wider transport network. Representative weekday demand as of October 2022 was some 20-25 per cent higher than before the pandemic, with weekend demand still typically around 90 per cent higher.

Santander Cycles

Santander Cycles is the brand name of TfL's cycle hire scheme, which started operating in London in 2010 and has since been progressively expanded to include all central London and some parts of inner London.

Since its introduction, demand for Santander Cycles has risen steadily, often breaking previous records of usage year on year. Figure 4.4 shows demand on Santander Cycles by user type over the last decade.

Figure 4.4 Annual demand on Santander Cycles by user type, 2011-2021.



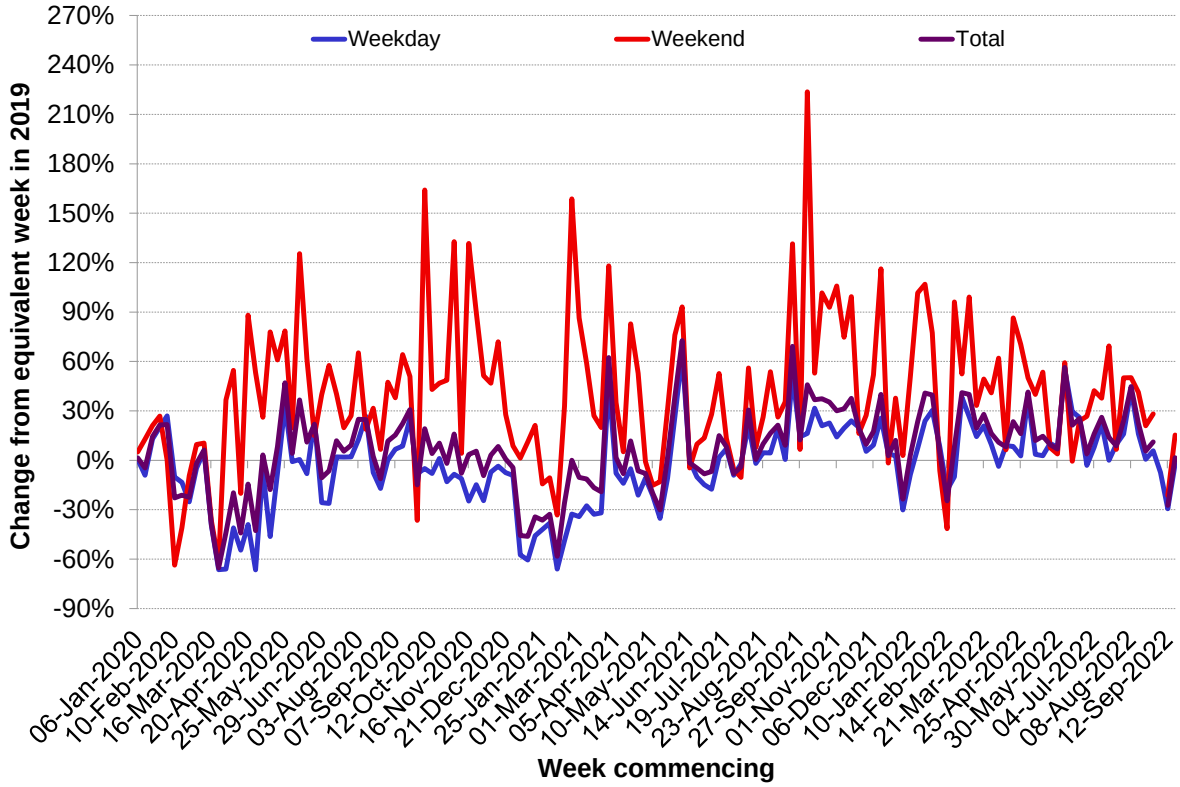
Source: TfL Cycle Hire.

Between 2011 and 2014 there were step increases in demand following the rapid expansion of the scheme, with 2012 seeing a peak in demand probably owing to the London 2012 Olympic and Paralympic Games. Growth was then steady until 2018 but dropped slightly in 2019. By 2021, however, annual demand was already exceeding pre-pandemic levels by about five per cent.

In terms of composition of the user population, typically between 57 and 60 per cent of hires were by members in recent years and the rest by casual users, although the proportion of the latter increased noticeably in 2020 as many people chose Santander Cycles during the pandemic.

Figure 4.5 shows a more recent trend in hires up to the end of September 2022 relative to equivalent dates before the pandemic.

Figure 4.5 Santander Cycles hires, Jan 2020-Sep 2022 vs 2019.



Source: TfL Cycle Hire.

Similar to the week-on-week trends in overall cycling, demand on Santander Cycles during the pandemic did not drop nearly as much as many other modes and recovered very quickly, with all but the strictest lockdown periods largely showing higher demand than before the pandemic.

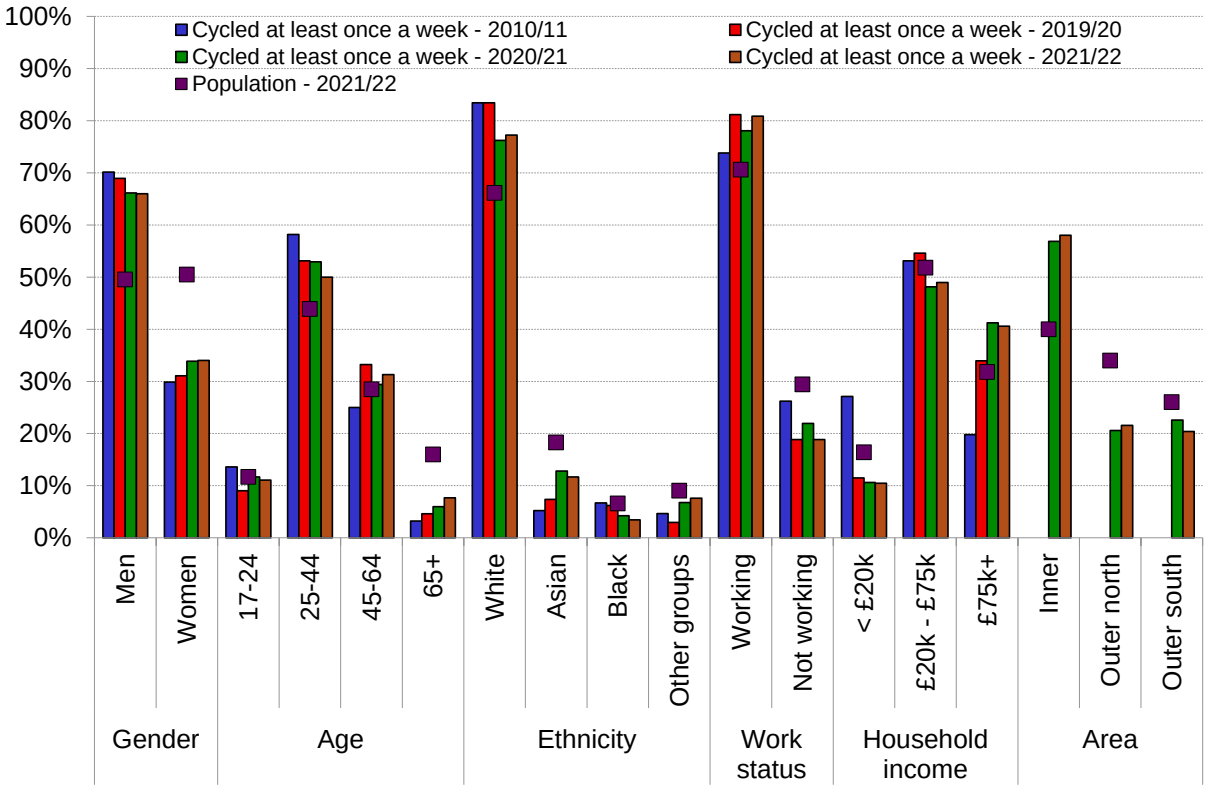
Another clear feature is the relatively much higher increase in demand on weekends compared to weekdays, which was also observed for general cycling.

London's cycling population

While cycling volumes have generally risen over recent years, changes to the cycling population (that is, the sociodemographic characteristics of those who cycle) have been much slower, with long-standing imbalances in the representation of certain groups only advancing very gradually in the last couple of years.

As an illustration, figure 4.6 compares the proportion of people from various sociodemographic groups who cycled at least once a week in the 2020/21 and 2021/22 with the immediate pre-pandemic baseline (2019/20) and the beginning of the previous decade (2010/11). For reference, the current proportion of people from those groups in the general population is also provided.

Figure 4.6 Demographic profile of people who cycled at least once in the last week alongside population average, 2010/11 and 2019/20-2021/22.



Source: TfL City Planning.

The main features are:

- There has been steady progress with the representation of **women** in cycling since 2010/11, with a step change noticeable since the pandemic. However, in 2021/22 still only 34 per cent of people who cycled were women, 16 percentage points below what would be an equal representation.
- In terms of **age**, the 17-24 and 45-64 groups are quite well represented in cycling, but over-65s are under-represented while those aged 25-44 make up a higher proportion of people who cycle than there are in the general population.
- The picture for **ethnicity** representation is more mixed. While White people remain over-represented in cycling and the representation of Black people does not seem to be improving, there has been some progress with Asian and particularly Arab, Mixed and Other ethnic groups, especially since the pandemic.
- There is also work to do on representation of people by **working status**, since currently there is under-representation of people who are not working, more so than in 2010/11.
- Similarly, there are imbalances in the representation of **income** among people who cycle, with over-representation of people with higher incomes and under-representation among those with the lowest incomes.
- Finally, it is clear that, at least during the pandemic (equivalent historic data is not available for comparison), inner London residents were over-represented in the cycling population, compared to outer London residents, particularly north of the Thames.

Potential pandemic legacy

Despite these slow changes in representation in the longer term, the pandemic seems to have triggered a rediscovery of cycling. Other results from the 2021/22 pandemic-adapted LTDS show that:

- Some four per cent of London residents have started cycling since the pandemic, while only less than half a percent stopped doing so.
- Around 10 per cent of London residents cycle more than before the pandemic, with only two per cent cycling less. Four per cent say they are cycling differently, for example at different times, for different purposes or in different areas.
- Some 14 per cent of London residents state that they will cycle more after coronavirus ceases to be a public health risk (note that some of the surveys were conducted at a time in 2021 when restrictions were still in place), while only six per cent state that they will cycle less.

Furthermore, another survey undertaken in 2021 (Cycling potential in London's diverse communities) also suggests that a more diverse range of Londoners (in terms of ethnicity) may have taken up cycling during the pandemic, since it showed no significant differences in the likelihood of people cycling based on their ethnicity, with the proportion of people cycling in the last 12 months in the Black (24 per cent), Asian (25 per cent) and Mixed/Multiple ethnic groups (31 per cent) very similar to that among White people (28 per cent) and the London average (27 per cent). The survey also found that people from Black, Asian and Mixed/Multiple ethnic backgrounds are significantly more open to taking up cycling in the future than White people.

Despite the above, the survey also found persisting differences in terms of gender, age and income, with men, people under 35 and people in medium- to high-income groups more likely to have cycled in the last year and men and people under 35 more open to take up cycling.

All in all, the latest trends suggest that cycling volumes can be expected to continue to show a net increase in coming years. However, and despite the positive signs of improvement in representation among certain groups, there is a risk that some gains from the pandemic may not be maintained, and work is still needed to diversify the cycling population and make cycling appealing to under-represented groups as well as to expand the range of trip purposes for which cycling is a first choice, particularly beyond leisure cycling and into other types of non-commute utility cycling.

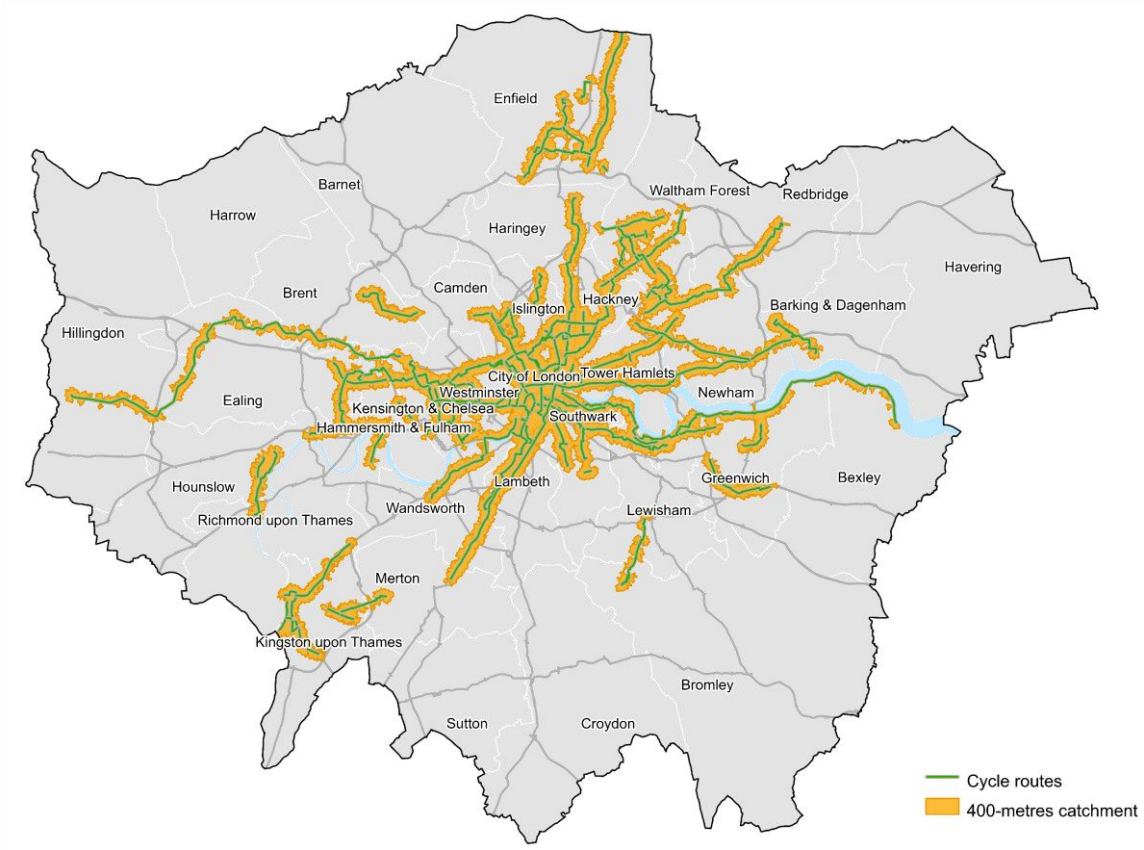
London's cycle network

The Mayor's aim is for 33 per cent of Londoners to live within 400 metres of London's cycling network by 2025. By autumn 2022 (figure 4.7), this proportion was 21.9 per cent, 2.5 percentage points higher than the value of 19.4 per cent from autumn 2021 and 10.4 percentage points higher than in 2019 before the pandemic (11.5 per cent).

Besides cycle routes, other initiatives like Low Traffic Neighbourhoods (LTNs) have proven to be effective in increasing cycling levels and encouraging a broader range of Londoners to cycle and more than 100 LTNs have been delivered since March 2020.

Following the successful delivery of much cycling infrastructure in 2020 and 2021 as part of the Streetspace for London programme, the focus is now on assessing the performance of those schemes which are still in place on a temporary or experimental basis and make informed decisions about their permanency, while continuing work on other, new strategic connections.

Figure 4.7 London's cycle network, autumn 2022.



Source: TfL City Planning.

4.3 Pedestrian activity

Walking trips

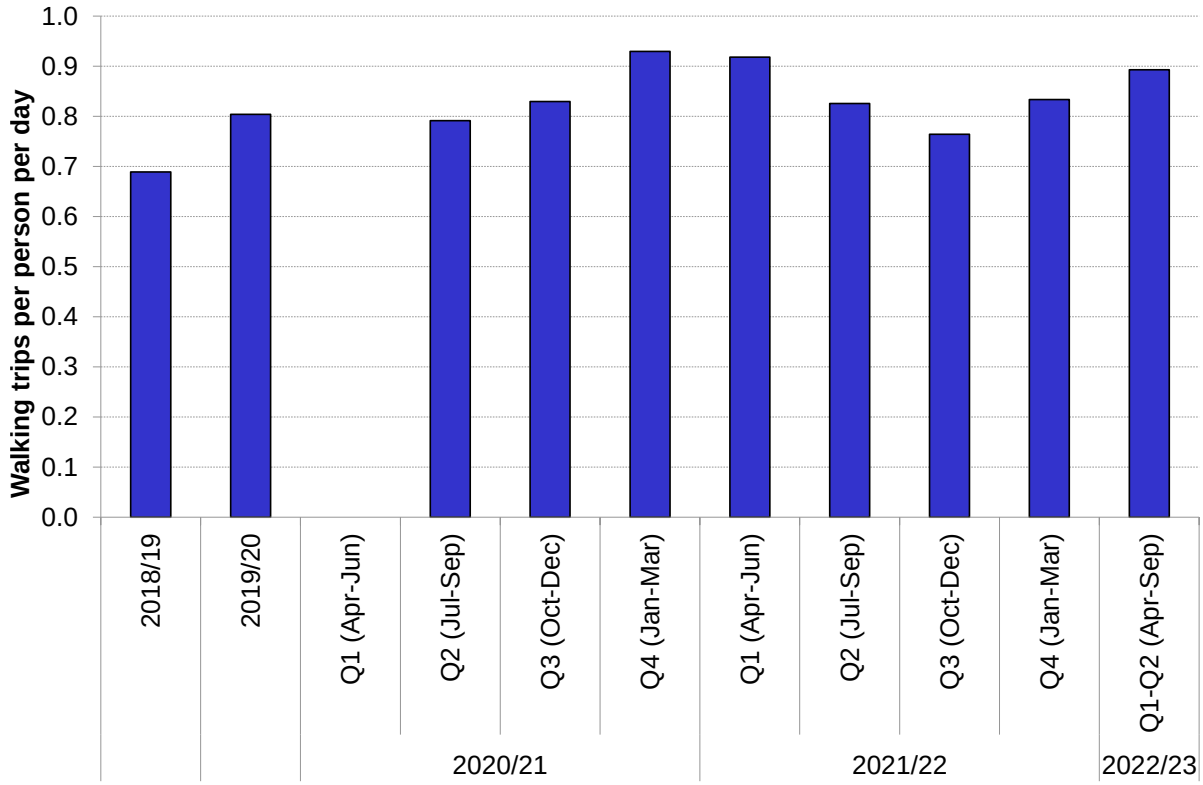
Our analysis of walking is mainly based on results from the LTDS discussed in chapter 3, which showed that walking accounted for almost 60 per cent of all trips made by Londoners aged 17+ during restriction-affected January-March 2021 and for typically more than 40 per cent at other times of the pandemic, compared to 35 per cent in 2019/20 before the pandemic. Most of these were local trips in inner and outer London.

In the first half of 2022/23 (April-September), the walking mode share for London residents was 41 per cent, lower than the pandemic average, but still higher than representative pre-pandemic values (about 32 per cent in the previous four years).

Figure 4.8 shows the trend in walking trips per person per day throughout the pandemic and suggests that, in general, walking trip rates were higher than the pre-

pandemic 2019/20 average of 0.8, ranging between 0.79 and 0.93 throughout 2020/21 and 2021/22.

Figure 4.8 Walking trip rates by quarter, London residents aged 17+, LTDS, 2018/19-2022/23.



Source: TfL City Planning.

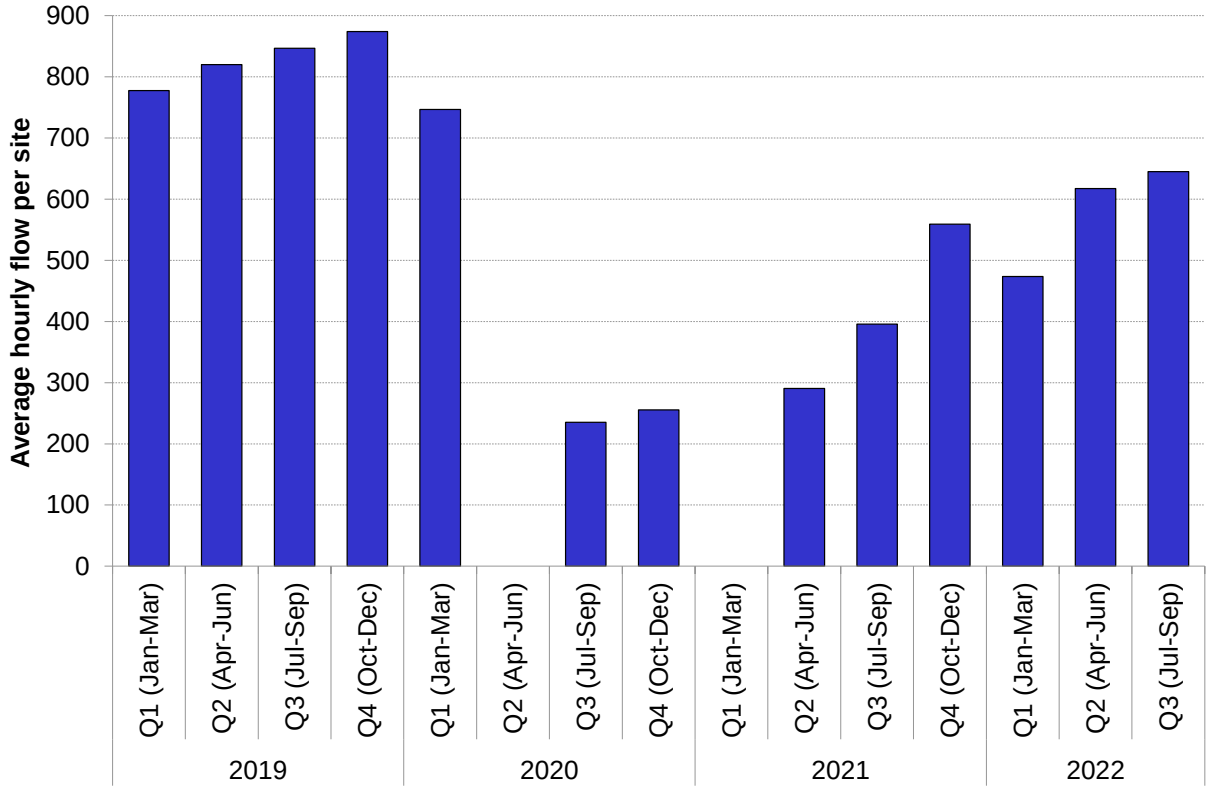
The latest (provisional) data from April-September 2022 shows that the walking trip rate is 0.89, 11 per cent higher than the 2019/20 (pre-pandemic) average and seven per cent higher than the value in the quarter between January and March 2022. This corresponds with higher overall rates of travel in the most recent data.

Pedestrian activity in central London

TfL's survey of pedestrian activity (footfall, or pedestrian populations) in central London consists of a comprehensive series of point-based counts, covering some 600 sites in total, according to an efficiently structured sample that affords both spatial and temporal disaggregation. It usually reports quarterly, although restrictions meant that some quarters were not surveyed during the pandemic.

Figure 4.9 clearly shows the impact of the pandemic on footfall in central London.

Figure 4.9 Average hourly pedestrian flow by quarter, central London, 2019-2022.



Source: TfL City Planning.

Pedestrian populations in central London in quarter 3 2020 (July-September) were just 28 per cent of the pre-pandemic level, with even quarter 2 2021 (April-June) recording just 35 per cent of the flows that might be expected at that time of the year.

Pedestrian populations have increased since all legal restrictions ended in July 2021, with flows in quarter 3 2021 (July-September) 68 per cent higher than in the same quarter in 2020 and in quarter 4 2021 (October-December) 119 per cent higher.

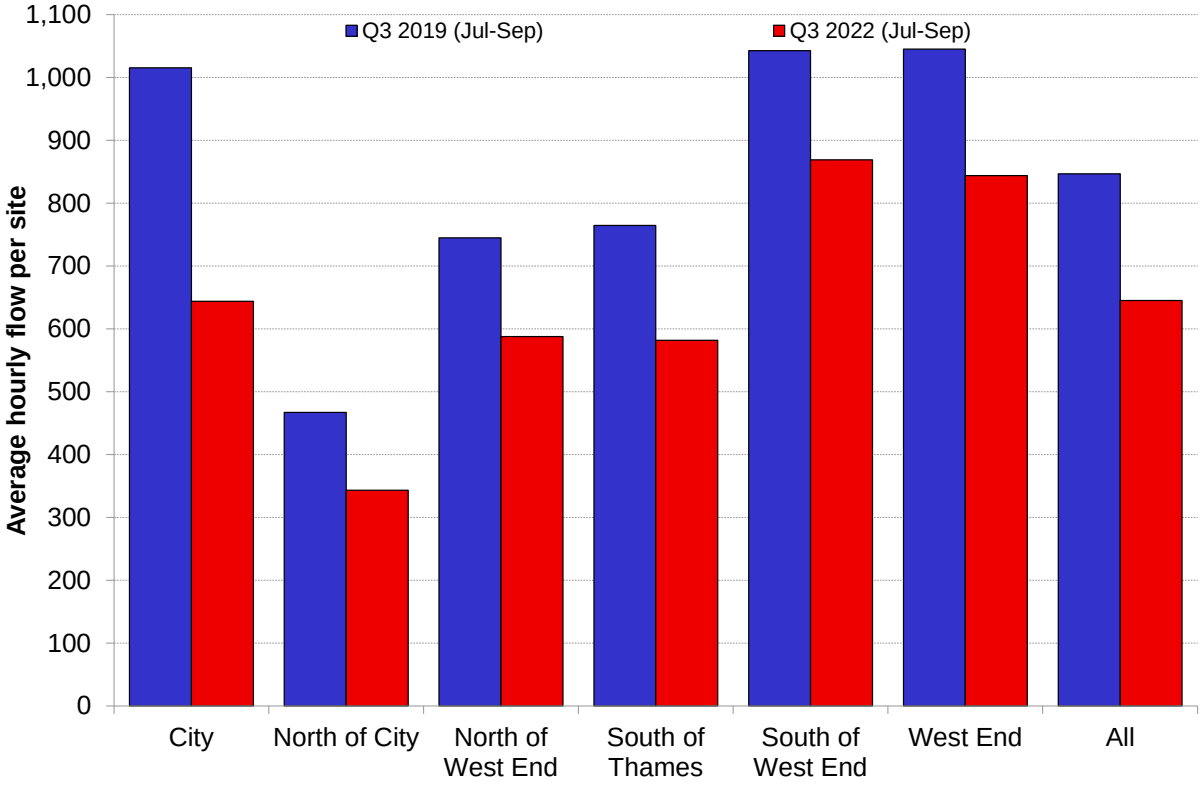
The introduction of further, temporary restrictions in late 2021 could have led to the decline seen in the first quarter of 2022 (January-March), although historically flows are lower in the first quarter than in the fourth.

In the second quarter (April-June 2022), flows increased again, to their highest since the pandemic began, but remained 25 per cent below pre-pandemic levels.

This trend is similar to that seen on the London Underground and reflects upon both the immediate pandemic impacts on commuting and other agglomerative activities as well as a lack of visitors, and hints at a potential longer-term reduction in travel to central London.

Within an overall reduction of 24 per cent and comparing quarter 3 in 2019 (July-September) with the same quarter in 2022, figure 4.10 shows the change by area.

Figure 4.10 Average hourly pedestrian flow by area, central London, Q3 2022 (Jul-Sep) vs Q3 2019 (Jul-Sep).



Source: TfL City Planning.

The greatest reduction was in the City (37 per cent). Pedestrian flows are now highest in the West End, although they remain 19 per cent below pre-pandemic levels.

The level of pedestrian activity in the latest quarter is 24 per cent lower than before the pandemic, similar to the London Underground over the same period. The increase in working from home and hybrid working in this period was clearly impacting the levels of pedestrian activity in the City, which before the pandemic had some of the highest levels of pedestrian activity.

4.4 Road danger

This section provides a summary of personal injury road traffic collisions and casualties, as reported to the police, in Greater London in 2021. Full details can be found in our Casualties in Greater London during 2021 factsheet. Further resources relating to road danger in London, including our interactive dashboard, can be found on the Road safety data page on TfL's website.

Summary

- In 2021 there were 23,319 reported collisions in London, resulting in 75 people being tragically killed, 3,505 being seriously injured (3,580 killed or seriously injured) and 23,092 being slightly injured.

- 2021 saw the lowest number of road fatalities on record, with a 22 per cent reduction in fatalities since 2020, and a 44 per cent reduction in persons killed or seriously injured from the 2005-09 baseline towards the Mayor's target of a 65 per cent reduction by 2022. For children aged under 15 there was a 68 per cent reduction.
- 2021 was an unusual year with large changes in the characteristics of those killed or seriously injured. This largely reflected changed travel patterns in the wake of the pandemic. Motorcycling and pedestrian fatalities were significantly lower, by historic standards, but cycling fatalities and serious injuries increased.
- For people killed or seriously injured in or by a bus we have achieved the Mayor's interim target for 2022 of a 71 per cent reduction from the 2005-09 baseline for the second year in a row (although in the context of the pandemic).
- As pandemic disruptions recede, there may be an increased challenge in protecting vulnerable road users from motorised vehicles as more people choose to walk, motorcycle, cycle, and use e-scooters.

Vision Zero objective

The Mayor's Vision Zero action plan makes it clear that no death or serious injury on London's roads is acceptable or inevitable. It sets interim targets of a 65 per cent reduction in all persons killed or seriously injured on London's roads by 2022 and a 70 per cent reduction in people killed or seriously injured in or by a bus by 2022, ahead of eliminating all deaths and serious injuries by 2041.

To assess performance, 2021 figures are compared with those for 2020 and with the back-estimated average for 2005-09, which is the baseline against which TfL measures progress towards the Mayor's targets.

Achievement of the Mayor's interim road danger reduction targets for 2022

During 2021 the number of people killed or seriously injured was the second lowest seen, after 2020. In 2021 the number of people killed or seriously injured on London's roads was 3,580, which equates to a 44 per cent reduction against the 2005-09 baseline, against an interim target for 2022 of a reduction of 65 per cent.

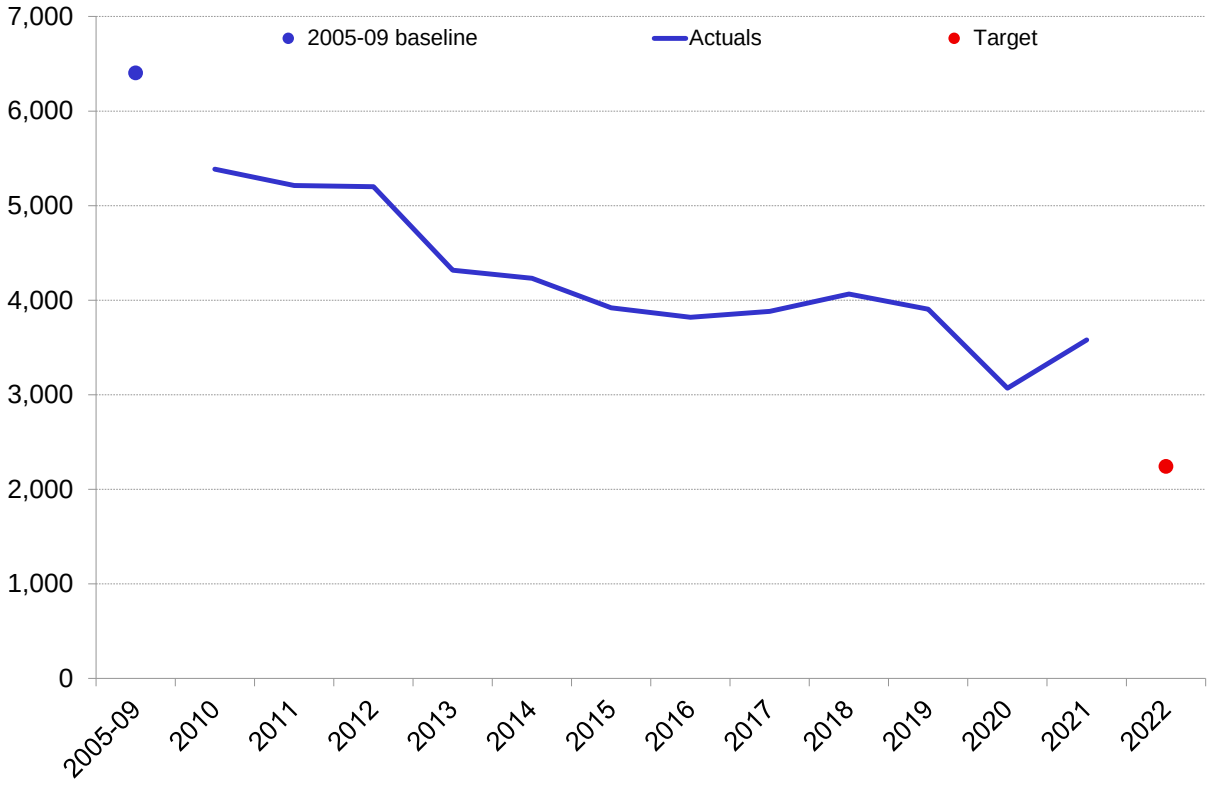
For people killed or seriously injured in or by a London bus the value for 2021 was 174, which equates to a 71 per cent decrease against the 2005-09 baseline, against the interim 70 per cent reduction target for 2022, therefore meeting the 2022 target for the second year in a row.

Figures 4.11 and 4.12 show recent progress towards both these targets.

Outcomes for both 2020 and 2021 need to be viewed in the context of the pandemic, which reduced overall travel and activity for prolonged periods, but also led to many other changes in the ways in which London's road network was used and operated.

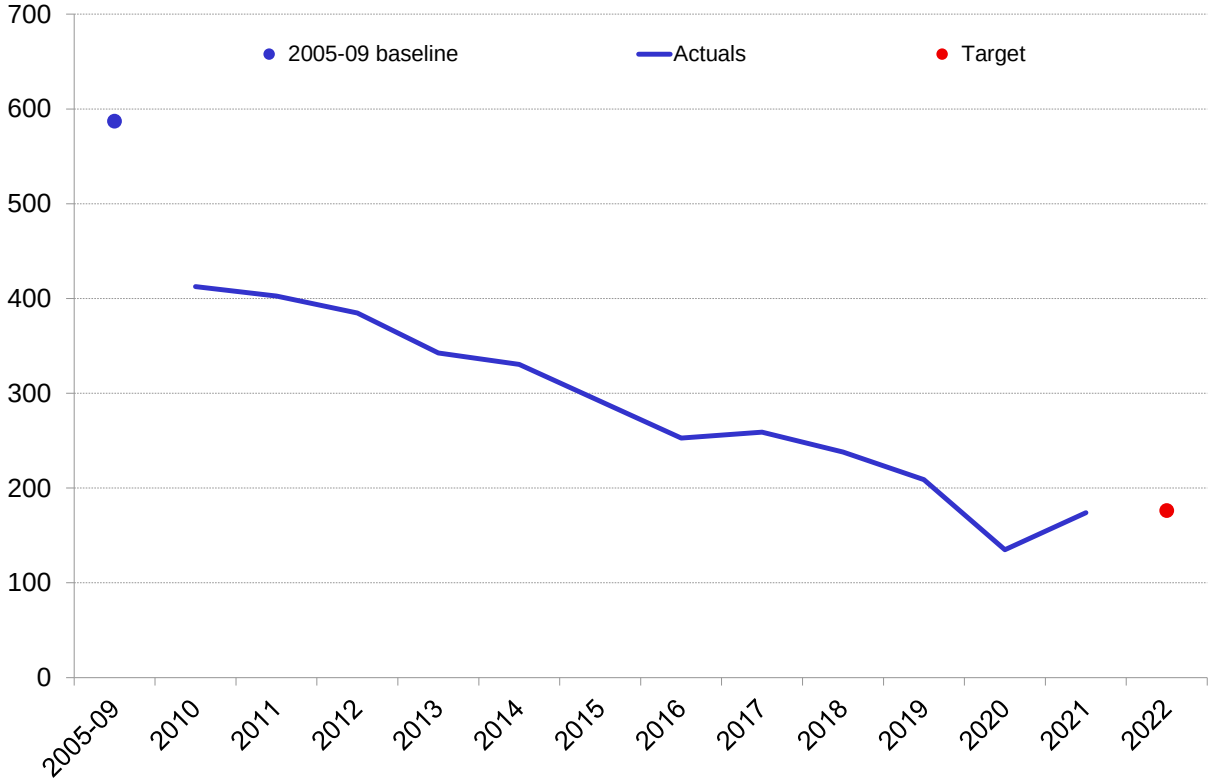
This particularly applies to the relative increases in 2021, as activity returned, compared to the relatively low values for 2020, which was more comprehensively affected by the pandemic.

Figure 4.11 Progress towards the Mayor's Vision Zero target for killed or seriously injured casualties in road traffic collisions, 2005-09 baseline-2022.



Source: TfL Safety, Health and Environment.

Figure 4.12 Progress towards the Mayor's Vision Zero target for killed or seriously injured casualties involving London buses, 2005-09 baseline-2022.



Source: TfL Safety, Health and Environment.

Road danger in 2021

The period since March 2020 saw reduced travel, especially during the lockdown periods, and a corresponding reduction in road casualties. Most pandemic restrictions were removed in July 2021, corresponding with an increase in activity, followed by a temporary re-introduction of measures in December 2021.

Despite this increase in activity, the number of people killed on London's roads in 2021 fell by 22 per cent from 2020 to the lowest level on record, compared to a seven per cent increase nationally. However, during 2021 there was a nine per cent increase in the number of people injured in road traffic collisions compared to the previous year, and an 11 per cent increase nationally. The number of people that were killed or seriously injured increased by 17 per cent compared to 2020, with a 13 per cent increase nationally. This was partly due to 2020 being heavily affected by lockdowns, with a return to the previous pre-pandemic trend in casualties as London has recovered from the pandemic.

Compared to the pre-pandemic 2017-19 average, the total number of injuries was 15 per cent down and the number of people killed or seriously injured was nine per cent down. In terms of travel behaviour, the pandemic contributed to fewer public transport journeys (including bus journeys) and an increase in personal transport modes, especially cycling and other vehicles, such as e-scooters.

More broadly, 2021 remained a typical year with 81 per cent of those killed or seriously injured while walking, cycling, or riding a motorcycle, compared to 82 per cent during 2020.

Reflecting their share of traffic, car drivers remained the most likely to be involved in a collision which injured someone else on the road. In 2021 they were the vehicle involved in 64 per cent of all casualties on London's roads and accounted for 73 per cent of vehicle kilometres travelled in 2020. However, motorcyclists were involved in twice as many casualties than their share of traffic, and goods vehicles also remain disproportionately represented in fatal or serious collisions.

Trends in the number of casualties

A total of 26,672 people were reported injured to the police in London during 2021. A total of 75 people were tragically killed, 3,505 were seriously injured and 23,092 were slightly injured. Table 4.1 summarises these recent developments.

The number of people killed or seriously injured was 44 per cent lower than the 2005-09 baseline and the number of children killed or seriously injured was 68 per cent lower than the baseline.

Compared to the 2005-09 baseline, fewer people were killed or seriously injured across all modes (between 20 and 74 per cent reductions) except for people killed or seriously injured while riding a cycle (up 36 per cent against the baseline). This increase should be seen in the context of a 63 per cent increase in the number of journeys cycled between the 2005-09 baseline and 2020.

Table 4.1 People killed or seriously injured in road traffic collisions in London, 2021 vs 2020 and the 2005-09 and 2017-19 baselines.

	Casualty numbers				Change in 2021 from…		
User group	**2005-09**	**2017-19**	**2020**	**2021**	**2020**	**2005-09**	**2017-19**
Bus or coach occupants	[277]	104	46	71	+54%*	-74%*	-32%
Car occupants	[1,773]	562	416	464	+12%	-74%*	-17%
Motorcyclists	[1,397]	1,066	768	929	+21%*	-33%*	-13%
Pedal cyclists	[737]	748	868	999	+15%*	+36%*	+33%
Pedestrians	[2,021]	1,376	868	960	+11%*	-52%*	-30%
Other vehicle occupants	[197]	94	104	157	+51%	-20%*	+67%
Total	**[6,403]**	**3,950**	**3,070**	**3,580**	**+17%***	**-44%***	**-9%**
Child bus or coach occupants	[23]	8	1	2	+100%	-91%*	-75%
Child car passengers	[82]	16	13	7	-46%	-91%*	-56%
Child pedal cyclists	[63]	20	22	24	+9%	-62%*	+20%
Child pedestrians	[423]	173	112	147	+31%*	-65%*	-15%
Other child casualties	[18]	16	8	17	+113%	-6%	+6%
Total child casualties	**[608]**	**233**	**156**	**197**	**+26%***	**-68%***	**-15%**

Source: TfL Safety, Health and Environment, based on STATS19.
Note: Asterisks (*) indicate where changes are significant at the 95 per cent confidence level, applying the Poisson probability distribution. Numbers in square brackets are back-estimated for the 2005-09 baseline. The number and severity of child casualties is a subset of the total reported casualties in London.

People killed

The number of people killed on London's roads decreased by 22 per cent compared to 2020 to the lowest level on record, despite the increase in activity as London recovered from the pandemic. This compares to a seven per cent increase nationally.

People killed while walking (48 per cent) and motorcycling (19 per cent) accounted for 67 per cent of all fatalities. This was down from 79 per cent in 2020. Cyclist deaths have increased compared to 2020, from 6 to 10.

Against the 2005-09 baseline the number of people killed was down by 64 per cent. In line with national figures, the trend in the number of fatalities had been broadly flat over the four years to 2020.

However, in 2021 the number of fatalities fell by 39 per cent against the pre-pandemic average in London (2017-19) compared to just 12 per cent nationally. E-scooter rider deaths also increased, from one to four.

People receiving serious injuries

In 2021 there were 3,505 seriously injured casualties reported on London's roads. This is an increase of 18 per cent on 2020 but it is nine per cent lower than the pre-pandemic average of 2017-19.

All modes have seen an increase against 2020 levels. The greatest absolute increase was recorded among motorcyclists, notably those riding smaller-capacity motorcycles of 125cc or below. The pivot to online shopping and the growth of the food delivery economy has contributed to an increase in new, small motorcycle registrations, with more people riding for work. The number of motorcycles registered with a capacity of 125cc or below increased by 30 per cent in 2021 compared to 2020, making up 73 per cent of the total market share.

Significant reductions were seen across all main modes against the 2017-19 pre-pandemic averages except for serious injuries to cyclists, which increased by 33 per cent, and injuries to people using other vehicles (including a high proportion of e-scooter riders). This partly reflects changes in the number of journeys made by these modes.

People receiving slight injuries

In 2021 there were 23,092 slightly injured casualties reported on London's roads. This is a nine per cent increase on 2020 but is 15 per cent lower than the pre-pandemic average (2017-19). The greatest absolute increase was among motorcyclists, most notably involving motorcycles with a capacity of 125cc or lower.

Collisions involving buses

Table 4.2 compares persons killed or seriously injured in collisions or other incidents involving buses for 2021 and 2020.

In 2021 one bus passenger was fatally injured as the result of a fall in the stairwell. The number of people killed or seriously injured in or by a bus increased by 29 per cent between 2020 and 2021, to 174 people. However, this is the second lowest number on record after 135 in 2020 and is 26 per cent down on the 2017-19 baseline, thereby meeting the Mayor's 2022 target.

Table 4.2 Casualties involving buses, by severity, 2021 vs 2020.

Mode	Fatal	Serious	Slight	Total
Bus/coach driver/passenger	1 (-50%)	66 (+59%)*	746 (+31%)*	813 (+3%)*
Car	0 (-)	8 (+33%)	159 (+39%)*	167 (+1%)*
Goods vehicle	0 (-)	1 (-)	14 (+27%)	15 (+7%)
Motorcycle	1 (0)	15 (+15%)	37 (-21%)	53 (+4%)
Pedal cycle	1 (-100%)	30 (+88%)*	54 (+17%)	84 (+18%)
Pedestrian	3 (-50%)*	46 (-6%)	124 (+20%)	173 (-2%)*
Taxi or private hire	0 (-)	0 (-100%)	9 (-36%)	9 (-10%)
Other vehicle	0 (-)	3 (+50%)	4 (-60%)	7 (-17%)*
Total	**5 (-29%)***	**169 (-31%)***	**1,147 (-25%)***	**1,321 (+3%)***

Source: TfL Safety, Health and Environment.
Note: Asterisks (*) indicate where changes are significant at the 95 per cent confidence level, applying the Poisson probability distribution. Numbers in brackets show change from 2019.

5. London’s air quality and carbon dioxide emissions

5.1 Introduction

This chapter reviews the latest trends and developments relating to London’s local air quality and emissions of carbon dioxide.

Although London’s air quality has improved over recent years, partly reflecting key Mayoral initiatives such as the Ultra Low Emission Zone (ULEZ), parts of London continue to exceed nitrogen dioxide (NO_2) limit values. There is also evidence that these high levels disproportionately affect the more vulnerable in society, even given the recent extensions to the ULEZ scheme.

Furthermore, given that there are no entirely safe levels of air pollution, the World Health Organization (WHO) has recommended more stringent health-based air quality guidelines. This means that a continued focus on reducing toxic emissions is vital for the health and wellbeing of Londoners in the future.

In January 2022, the Mayor announced the aim to bring forward the 2050 zero carbon target published in the London Environment Strategy to 2030. The London Net Zero 2030: An Updated Pathway report outlines that meeting this ambitious target will require significant reductions in emissions across several sectors in London, including road transport.

Encouraging the electrification of London’s vehicle fleet is one way of working towards this challenge. TfL’s Electric Vehicle Infrastructure Strategy, published in December 2021, provides an update to the pioneering 2019 TfL Electric Vehicle Infrastructure Delivery Plan, and this chapter provides an update on aspects of electric vehicle charging infrastructure in London.

5.2 Focus on: ULEZ expansion to inner London

Summary

On 8 April 2019 the Mayor launched the world’s first 24-hour Ultra Low Emission Zone (ULEZ) in central London. On 25 October 2021 the zone was expanded up to, but not including, the North and South Circular Roads. The ULEZ is now 18 times the size of the original area and covers four million people, more than a third of London’s population.

The ULEZ does not operate in isolation but together with the London-wide Low Emission Zone (LEZ). This was originally launched in 2008; making it the oldest of the capital’s emission control schemes, and applies to large and heavy vehicles.

In March 2021 enforcement of tougher emission standards for the LEZ began. Prior to this, the standards had not changed since 2012; but now the LEZ standards are the same as the ULEZ standards for most large and heavy vehicles.

Six months on from the ULEZ expansion and over a year on from the enforcement of tighter LEZ standards the data indicates that these schemes are having a significant impact on the number of older, more polluting vehicles seen driving in London and the levels of harmful pollution that Londoners are exposed to.

A bigger share of vehicles in London are cleaner. Six months after the launch of the ULEZ expansion nearly 94 per cent of vehicles seen driving on an average day in the expanded zone met the strict ULEZ standards, up from 87 per cent in the weeks before the zone expanded and up from 39 per cent in 2017 when impacts associated with the ULEZ began. The compliance rate on boundary roads was 90 per cent and the compliance rate in outer London was 85 per cent.

Key impacts, based on six months of operation up to spring 2022, are summarised below. An updated report, reflecting one year of operation of the expanded ULEZ zone, is expected to be released by the Greater London Authority in early 2023.

- **There are fewer older, more polluting vehicles in the zone.** There were 67,000 fewer non-compliant vehicles in the zone on an average day compared with the period right before the ULEZ expansion, down from an average of 124,000 daily vehicles. This is a reduction of 54 per cent.
- **The original LEZ continues to have an impact.** Large and heavy vehicles, which fall under the London-wide LEZ, have a compliance rate of 96 per cent, up from an estimated 48 per cent prior to the tightening of standards in February 2017.
- **There has been an overall reduction in vehicles and traffic flows in the zone.** Overall, there were 21,000 fewer vehicles seen in the zone on an average day (a reduction of two per cent) and early estimates suggest that traffic flows are around two per cent lower than in the weeks before the expansion. However, many other factors also affected traffic levels during the winter of 2021/22.
- **There are fewer diesel cars.** On average there were 44,000 fewer diesel cars driving in the zone each day, a 20 per cent decrease since the weeks before the ULEZ expansion.
- **This means people in the zone are breathing cleaner air.** Harmful NO_2 concentrations alongside roads in inner London are estimated to be 20 per cent lower than they would have been without the ULEZ and its expansion. In central London, NO_2 concentrations are estimated to be 44 per cent lower than they would have been. This decrease in concentrations close to roads will have also led to reduced air pollution in locations away from traffic.
- **The air is also cleaner on the boundary.** All monitoring sites on the boundary of the expanded zone have seen reductions in NO_2 concentrations, with an estimated 17 to 24 per cent reduction in pollution on the boundary compared to a scenario without the ULEZ, reflecting the general improvement in emissions of vehicles travelling to and from the expanded zone.

ULEZ expansion and LEZ revision

The aim of the ULEZ is to reduce harmful emissions from road transport by disincentivising the use of older, more polluting vehicles.

The ULEZ specifically targets the air pollutants that are most harmful to human health: nitrogen dioxide (NO_2) and particulate matter (PM). The emissions of these pollutants from road vehicles are regulated by the Euro standards.

The ULEZ operates 24 hours a day, every day of the year except Christmas Day (25 December). Vehicles must meet strict emission standards to drive in the ULEZ area:

- Euro 4 for petrol cars and small vans (registered new from January 2006)
- Euro 6 for diesel cars and small vans (registered new from September 2015)
- Euro 3 for motorcycles and other L-category vehicles (registered new from July 2007)

Vehicles that do not meet these standards must pay a charge of £12.50 per day to travel in the zone.

The London-wide LEZ was introduced in 2008 and operates 24 hours a day, every day of the year. On 1 March 2021 the emission standards for the LEZ were strengthened for heavy vehicles. The new standards are:

- Euro VI for buses, coaches and heavy goods vehicles and vans over 3.5 tonnes (vehicles registered new from September 2016).
- Euro 3 for particulate matter only for vans between 1.2 and 3.5 tonnes and minibuses under 5 tonnes (vehicles registered new from January 2001).

Vehicles that do not meet these standards must pay a charge of £100 per day. Heavy vehicles that do not meet the lower Euro IV standard must pay a higher charge of £300 per day.

For most vehicles, the strengthening of the LEZ standards means that they are not separately subject to LEZ and ULEZ standards.

Tougher LEZ standards were enforced from March 2021 and the expansion of the ULEZ took place on 25 October 2021. This section covers the first year of the stronger LEZ and the first six months of operation of the expanded ULEZ. It provides the first analysis of the impact of expanding the ULEZ on air pollution concentrations in inner London, as well as compliance rates, traffic and fleet composition.

Assessing the impact

The impact of the ULEZ and LEZ can be assessed using several metrics, including:

- Number of vehicles and compliance rates
- Modelling of vehicle emissions
- Changes in fleet composition
- Air quality monitoring
- Traffic flow data

Ultimately it is the amount of pollution in the air (the concentration) that matters for people’s health. While reducing emissions is the vital step in reducing concentrations, there are other important factors that affect concentrations, particularly the weather, natural seasonal variations and, for NO_2, significant atmospheric chemistry processes involving other pollutants and sunlight.

For this reason, it takes time for a robust quantification of the impact on concentrations to emerge. The early assessment of impacts detailed below should therefore be interpreted in this context.

In common with many other indicators described in this report, the introduction of the expanded ULEZ took place in the context of the coronavirus pandemic and the significant changes to daily activity and travel in London brought about by it. As far as possible, these have been accounted for in arriving at this initial analysis of the impacts. In particular, observed vehicle compliance rates provide a robust indicator of the impact of the scheme.

Compliance with the ULEZ

Table 5.1 shows the growth in compliance rates for different vehicle types after the first six months of the expanded ULEZ, compared to indicative figures prior to the launch and from 2017, when the Mayor announced plans for the expansion and confirmed the Toxicity Charge (T-Charge), the predecessor to the ULEZ and its expansion.

It should be noted that the phenomenon of ‘pre-compliance’ (drivers upgrading their vehicles ahead of the scheme introduction) is an important factor and generates air quality benefits from the scheme ahead of its actual introduction.

Table 5.1 Average daily proportion of compliant vehicles detected in the expanded ULEZ zone, May 2022, Oct 2021 and Feb 2017.

Vehicle type	Feb 2017[1]	Oct 2021 (before launch)[2]	May 2022
Cars and PHVs (excl. taxis)	44%	89%	95%
Vans (up to 3.5 tonnes)	12%	71%	83%
Motorcycles	50%	96%	97%
All ULEZ vehicles	**39%**	**87%**	**94%**

Source: TfL City Planning.
1: Based on data from the London Atmospheric Emissions Inventory except for motorcycles which is based on DEFRA fleet composition data.
2: Based on indicative data gathered in 12-20 October 2021.

Table 5.1 shows that compliance within the expanded ULEZ is extremely high, reaching 93.8 per cent across all vehicle types in May 2022. There was a 54 per cent reduction in the number of non-compliant vehicles entering the zone from October 2021 to May 2022.

Diesel vehicles produce emissions which are particularly harmful to human health. Diesel exhaust is a known carcinogen, and diesel cars generally emit more nitrogen oxides (NO_x) and fine particulate matter ($PM_{2.5}$) than petrol cars, especially in dense urban environments like London. This is why the ULEZ standard is higher for diesel (Euro 6) than for petrol cars (Euro 4).

The ULEZ expansion has been particularly successful in helping to reduce the number of non-compliant diesel cars driving in the zone. Prior to the ULEZ expansion, 64 per cent of diesel cars met the ULEZ standard. This has increased to 81 per cent, a jump of nearly 18 percentage points, which means that there are currently around 60 per cent fewer polluting diesel cars in the zone each day.

There has also been a steady growth in compliance rates for large and heavy vehicles which fall under the London-wide LEZ. More than 96 per cent of large and heavy vehicles now meet the strict standards, which are the same as the ULEZ standards. TfL buses are included in these figures, and from April 2019, all buses

operating in central London met or exceeded the ULEZ standards and since January 2021 all TfL buses meet or exceed the new tougher LEZ standards.

Impact on air pollution concentrations (ULEZ only)

In 2019, 44 per cent of London’s nitrogen oxide (NO_x) emissions were from road transport. By disincentivising the use of older, more polluting vehicles in inner London, the ULEZ expansion is designed to reduce the amount of NO_x emitted by vehicles, leading to lower NO_2 concentrations in the zone.

This section gives an initial analysis of air pollution data from London’s automatic monitoring network and looks at how pollution levels have changed over time. Further analysis will be carried out once a full year of data is available.

In this section monthly average concentrations have been used to calculate trends in the period from 2010 to the end of June 2022. It should be noted that measurement data from 2022 have not yet been ratified.

The ULEZ is one of several policies to reduce air pollution from road transport in London. Other local policies include the London-wide LEZ (for heavy vehicles) and investment in cleaner buses and taxis, alongside wider policies such as progressively tighter EU-wide exhaust controls for new vehicles. As a result, it is not straightforward to isolate the impact of the ULEZ and its expansion.

For this analysis the trends in outer London (largely away from the influence of the earlier central ULEZ and recently expanded zone) have been used as a predictor of the change in central and inner London that would have happened if the ULEZ had not been in place. Comparing the measured trends in central and inner London with those in outer London reveals the additional changes within the central and inner zones, which provides an estimate for the impact of the ULEZ.

Figure 5.1 shows the trends in NO_2 at monitoring sites in London from 2010 to 2022.

The graph shows monthly average NO_2 concentrations grouped by site type and location, statistically smoothed to reduce the impact of weather and seasonality.

The trends seen in the graph reflect the impact of all factors over the period, notably the pandemic, which particularly affected traffic and activity in central London during 2020 and 2021. Analysis to understand the contribution of the ULEZ expansion specifically is described below.

A technique often used to isolate the proportion of pollution related to traffic sources is to subtract the background concentration from the roadside concentration. This is referred to as the ‘roadside increment’.

Changes in the roadside increment, or traffic contribution, in outer London have been used to represent the changes that would have occurred in a ‘without ULEZ’ scenario for roadside sites in central and inner London and at the boundary sites (see below).

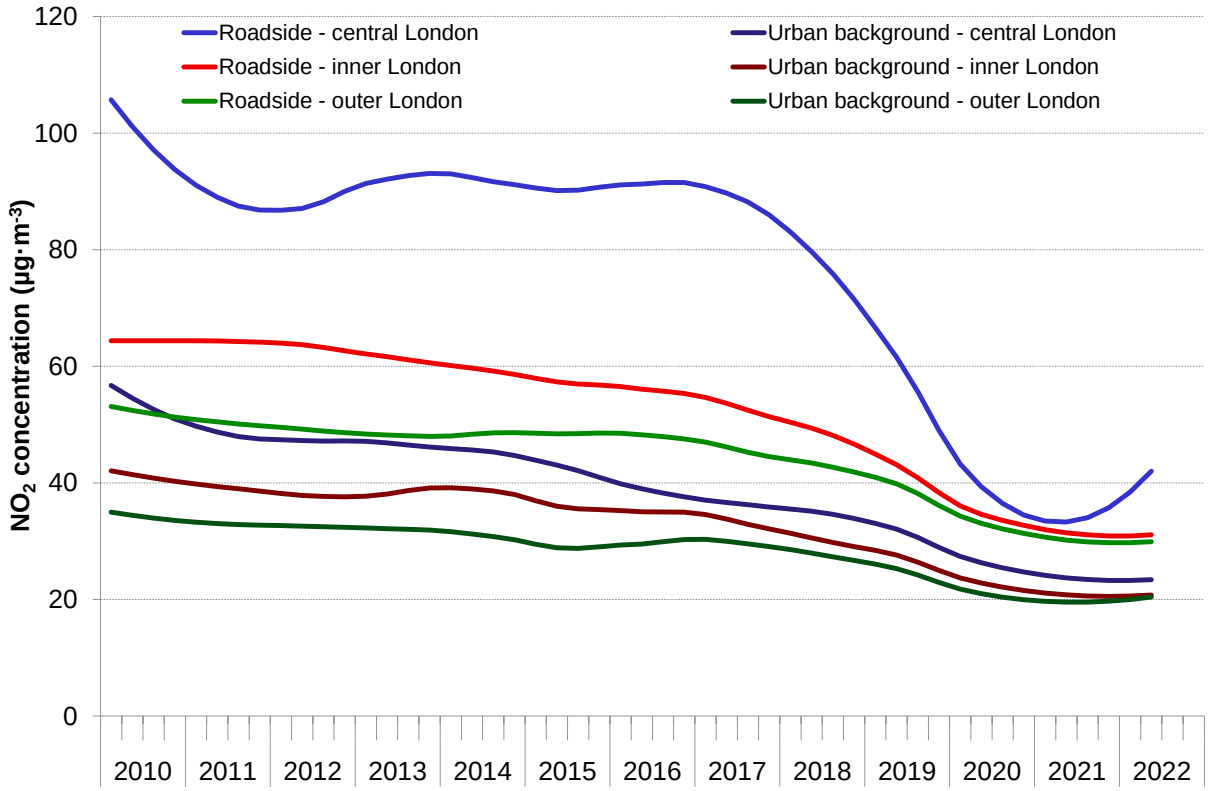
However, policies including the LEZ and other transport schemes have also been implemented in outer London, which means that pollution changes there are not solely due to the natural turnover of the fleet.

As time progresses and NO_2 concentrations continue to decline due to Mayoral policies, it is becoming increasingly complex to disentangle the impacts of each separate policy on air pollution concentrations in the different areas of London.

In addition to the ULEZ and LEZ, many of the Mayor's other policies, such as the growth of the zero-emission bus and taxi fleets, will have had positive impacts on concentrations, particularly in central and inner London.

Therefore, the analysis below can be seen to show the impacts of not just the central London ULEZ and its expansion, but of all the Mayor's policies to reduce emissions from transport.

Figure 5.1 Average NO_2 concentrations in London by quarter, 2010-2022.



Source: London Air Quality Network.

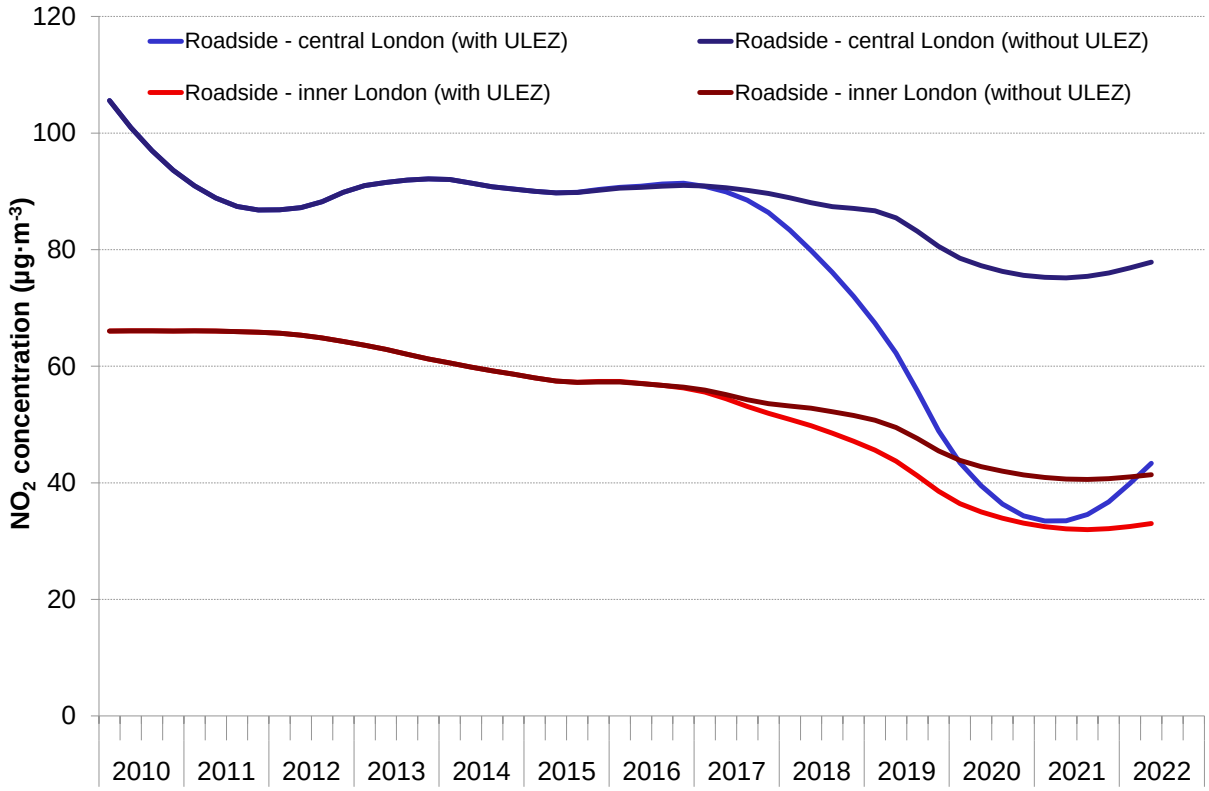
Figure 5.2 shows the trends in monthly average NO_2 concentrations at central and inner London roadside sites compared with the estimated path they would have followed had they reduced at the same rate as outer London roadside sites since 2017 (the 'without ULEZ' scenarios on the graph).

The graph shows that both central and inner London roadside sites have seen concentrations reduce much quicker and further than would have been expected without the ULEZ and its expansion.

Table 5.2 quantifies the difference between the analysed trends for central and inner London roadside and the estimated 'without ULEZ' scenarios averaged over three-month periods since 2019. This can be understood as the reduction at central and inner London roadside concentrations that is in addition to the changes measured at outer London roadside sites.

The difference between the measured trend and the 'without ULEZ' scenario in central London is substantial and demonstrates that the ULEZ, LEZ and other policies have had a transformative impact on reducing NO_2 levels in this area.

Figure 5.2 Average NO_2 concentrations in London by quarter, with and without ULEZ, 2010-2022.



Source: London Air Quality Network.

Table 5.2 Estimated reduction in NO_2 concentrations due to ULEZ policies, roadside sites in central and inner London, 2019-2022.

Period	Central London absolute reduction (µg·m^{-3})	Central London relative reduction	Inner London absolute reduction (µg·m^{-3})	Inner London relative reduction
Jan-Mar 2019	19	22%	5	10%
Apr-Jun 2019	23	27%	6	12%
Jul-Sep 2019	27	33%	6	13%
Oct-Dec 2019	32	39%	7	15%
Jan-Mar 2020	35	45%	7	17%
Apr-Jun 2020	38	49%	8	18%
Jul-Sep 2020	40	52%	8	19%
Oct-Dec 2020	41	55%	8	20%
Jan-Mar 2021	42	56%	8	21%
Apr-Jun 2021	42	55%	9	21%
Jul-Sep 2021	41	54%	9	21%
Oct-Dec 2021	39	52%	9	21%
Jan-Mar 2022	37	48%	9	21%
Apr-Jun 2022	35	44%	8	20%

Source: London Air Quality Network.

In April-June 2022, the most recent data available, the mean roadside NO_2 concentrations measured in central London were 35µg·m^{-3} lower than the estimated ‘without ULEZ’ scenario, a difference of 44 per cent.

In inner London, roadside NO_2 concentrations were 8µg·m^{-3} lower than the estimated ‘without ULEZ’ scenario, a difference of 20 per cent. Crucially, the air quality improvements in inner London are being seen over an area that is 18 times the size of the original central zone, improving air quality directly for the four million people living in this area and those who come into the area for work, study or leisure.

Figure 5.2 and table 5.2 also clearly show the importance of ‘pre-compliance’, that is, improvements in air quality as vehicle owners prepared for the introduction of the ULEZ in 2019 and its expansion in 2021.

As mentioned previously, the pandemic had large impacts on traffic volumes in central London. Therefore, it is not possible to attribute the recent reductions in concentrations solely to the ULEZ. However, it is clear that fleet compositions in London have been affected by the ULEZ, as described earlier. Thus, these changes are provisionally attributed to the ULEZ because they clearly align with the implementation dates of both the enforcement of tougher LEZ standards and the ULEZ expansion.

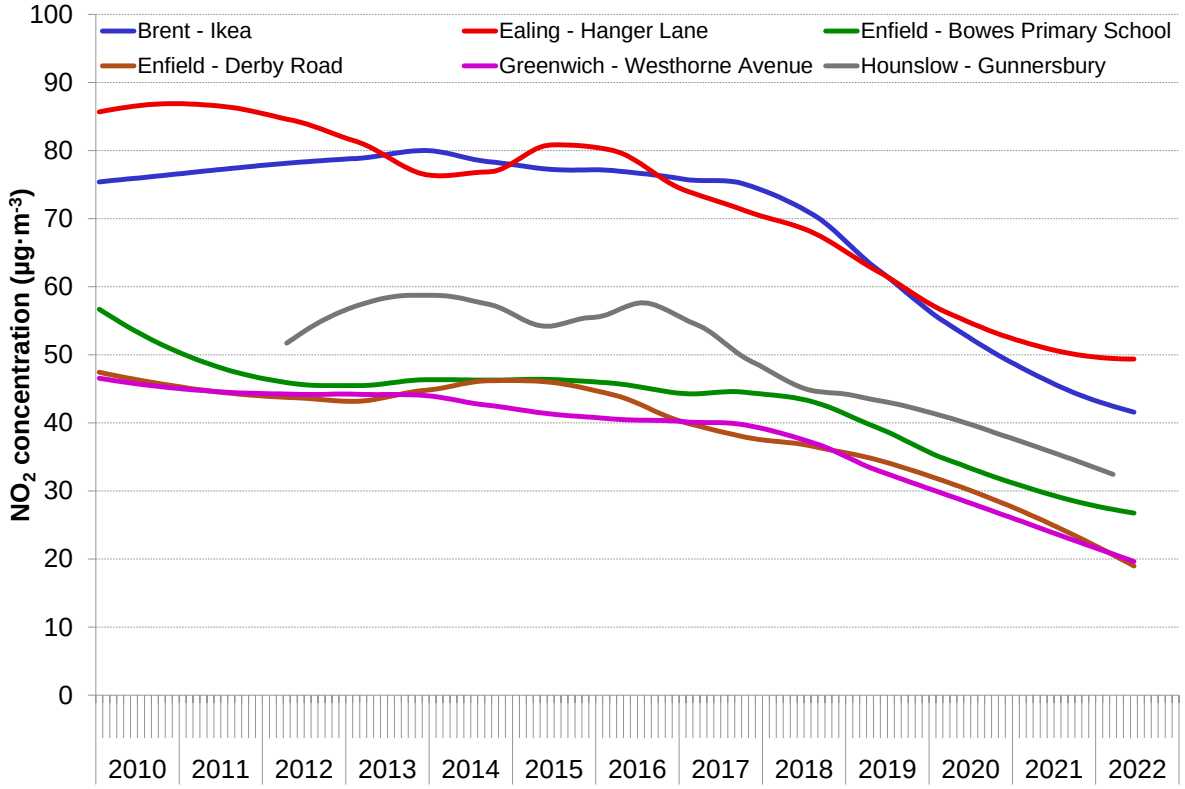
Trends in nitrogen dioxide on ULEZ boundary roads

Figure 5.3 shows that, similar to the monitoring sites within the ULEZ, there has been a decreasing trend in NO_2 concentrations at all the expanded ULEZ boundary sites and it also shows that generally this trend has accelerated since 2019. All monitoring sites on the boundary roads have seen reductions in NO_2 concentrations.

The impact of the ULEZ and its expansion on the boundary roads can also be analysed using the same method described above. Figure 5.4 shows the average monthly NO_2 concentrations for both groups of boundary sites, along with the trend they would have followed if they had reduced at the same rate as the outer London monitoring sites (the ‘without ULEZ’ scenario).

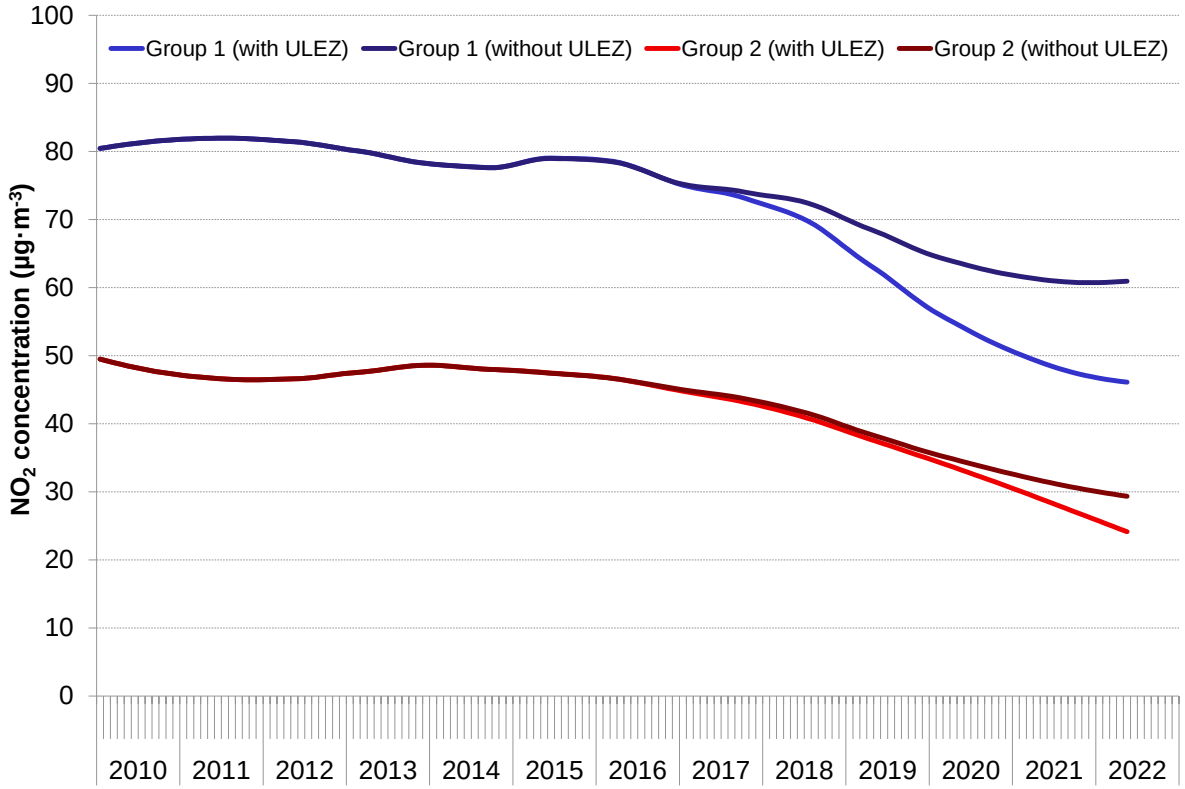
The analysis indicates that for Brent - Ikea and Ealing - Hanger Lane monitoring sites (group 1) there has been an estimated reduction of 15µg·m^{-3} (24 per cent) compared with the estimated ‘without ULEZ’ trend. For the other boundary monitoring sites (group 2), the estimated reduction was 5µg·m^{-3} (17 per cent).

Figure 5.3 Average NO_2 concentrations at ULEZ boundary roads by month, 2010-2022.



Source: London Air Quality Network.

Figure 5.4 Average NO_2 concentrations at ULEZ boundary roads by group and month, with and without ULEZ, 2010-2022.

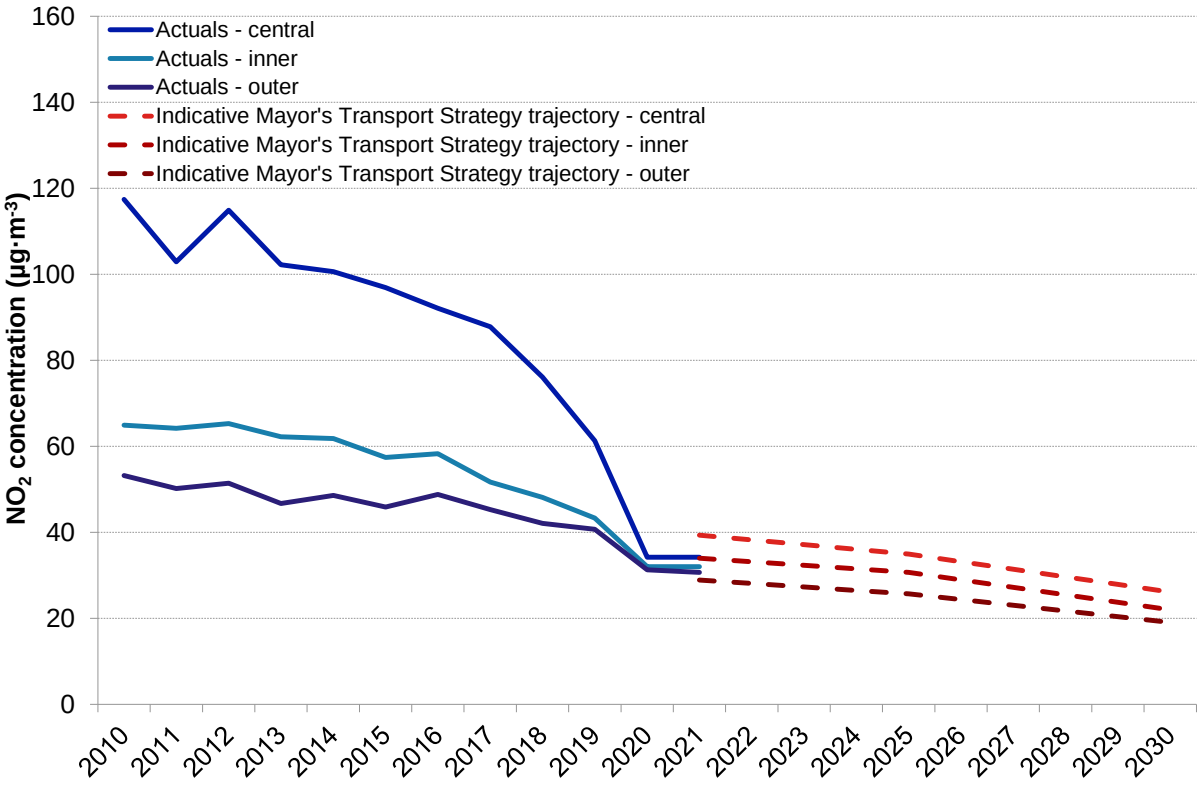


Source: London Air Quality Network.
Note: Group 1 includes the Brent - Ikea and Ealing - Hanger Lane sites, while group 2 includes the other sites.

Longer-term trend in nitrogen dioxide concentrations in London

Figure 5.5 shows the overall trend in nitrogen dioxide (NO_2) concentrations in London over recent years, alongside the Mayor's ambition for the future.

Figure 5.5 Average NO_2 concentration in London by area, 2010-2030.



Source: London Air Quality Network.

NO_2 concentrations across London have decreased from 2010 to 2017, particularly in central London. From 2017 onwards, the rate of reduction in NO_2 concentration in central London was significantly boosted by the introduction of the T-Charge, followed by the central London ULEZ.

5.3 Poor air quality and inequality

Introduction

The differential impacts of poor air quality on London's deprived communities have been previously documented (see Air Pollution and Inequalities in London: 2019 Update and Air Pollution Exposure in London: Impact of the London Environment Strategy) and this analysis has been extended by TfL to take account of the interim WHO recommendations for pollutant concentrations.

Our analysis looks specifically at the intersection between London's most deprived communities, as measured through indices of multiple deprivation (IMD), London's Black, Asian and minority ethnic (BAME) population (from the 2011 Census), NO_2 concentrations, and the TfL Road Network.

Approach

The WHO interim guidelines propose a revised limit value for NO_2 of 20µg·m^{-3}, and this is taken as the benchmark for this analysis.

Deprivation and ethnicity data are both disaggregated to the Lower layer Super Output Area (LSOA), while demographic and pollution concentration data are used at the Output Area level.

The proportion of BAME population is grouped into deciles and the top three, which include the LSOAs with the highest proportions of BAME population, are used for this analysis.

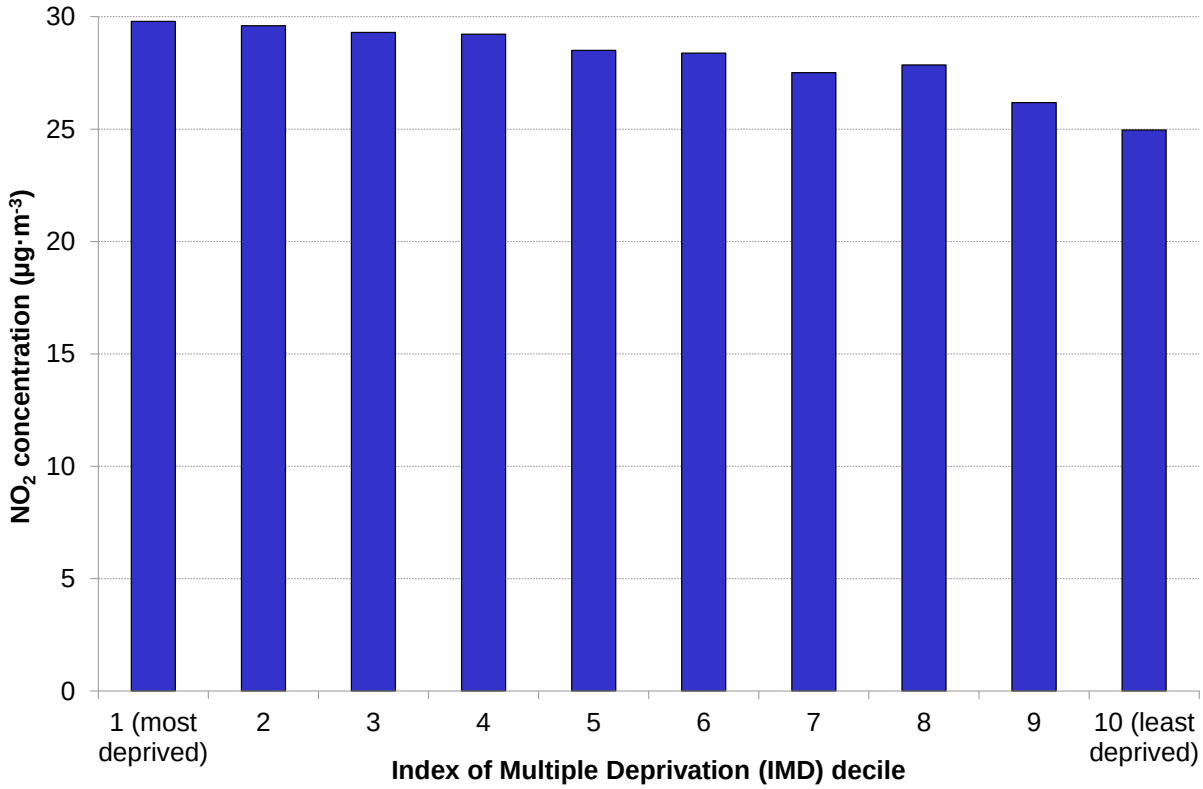
Deprivation data is also grouped into deciles, and in this case the lowest three are used, which comprise the LSOAs with the lowest IMD score (highest deprivation) in London.

Findings

The datasets have been combined in different ways to fully understand the statistical and spatial correlations among them.

Figure 5.6 shows the intersection of deprivation and NO_2 concentrations.

Figure 5.6 NO_2 concentrations by index of multiple deprivation decile, 2019.

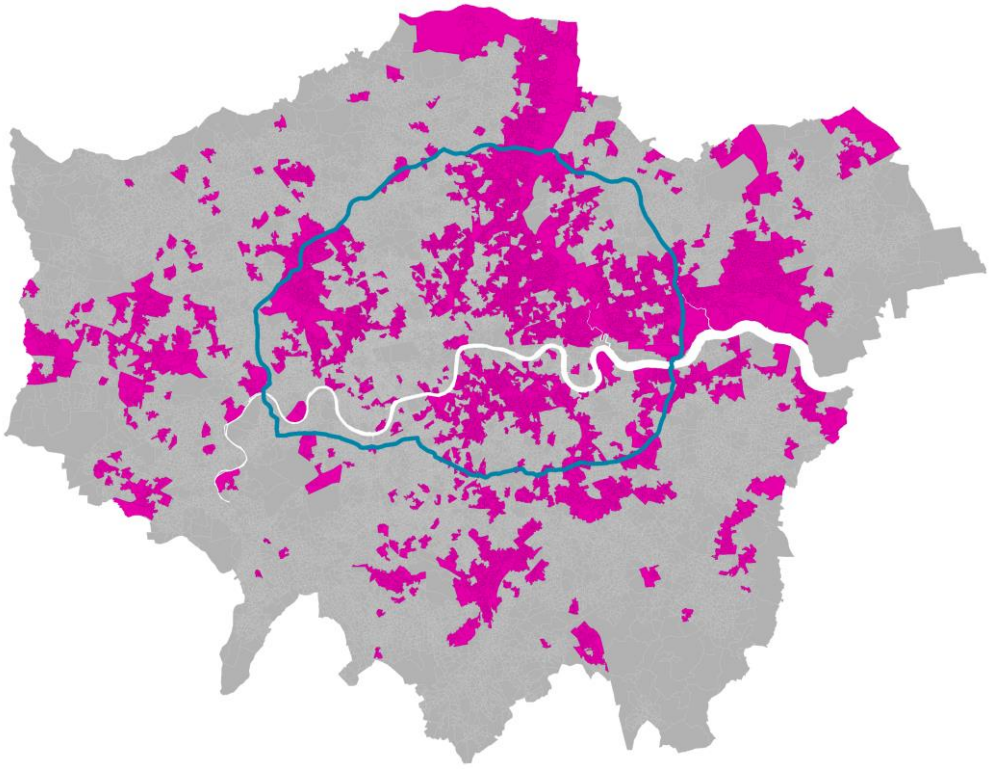


Source: TfL City Planning.

The graph shows that the more deprived areas are more likely to be exposed to higher NO_2 concentrations and the average NO_2 concentrations are 19.2 per cent higher in the most deprived LSOAs compared to the least deprived LSOAs.

Considering the 30 per cent most deprived LSOAs and their intersection with NO_2 concentrations above the interim WHO guideline, figure 5.7 shows their distribution across London. The shaded area accounts for 36.6 per cent of the London population (2.9 million people in 2011).

Figure 5.7 Spatial distribution of the 30 per cent most deprived areas with the highest NO_2 concentrations.



Source: TfL City Planning.
Note: The boundary of the expanded Ultra Low Emission Zone (ULEZ) is shown on the map for reference.

Figure 5.8 shows the intersection of the proportion of BAME population and NO_2 concentrations.

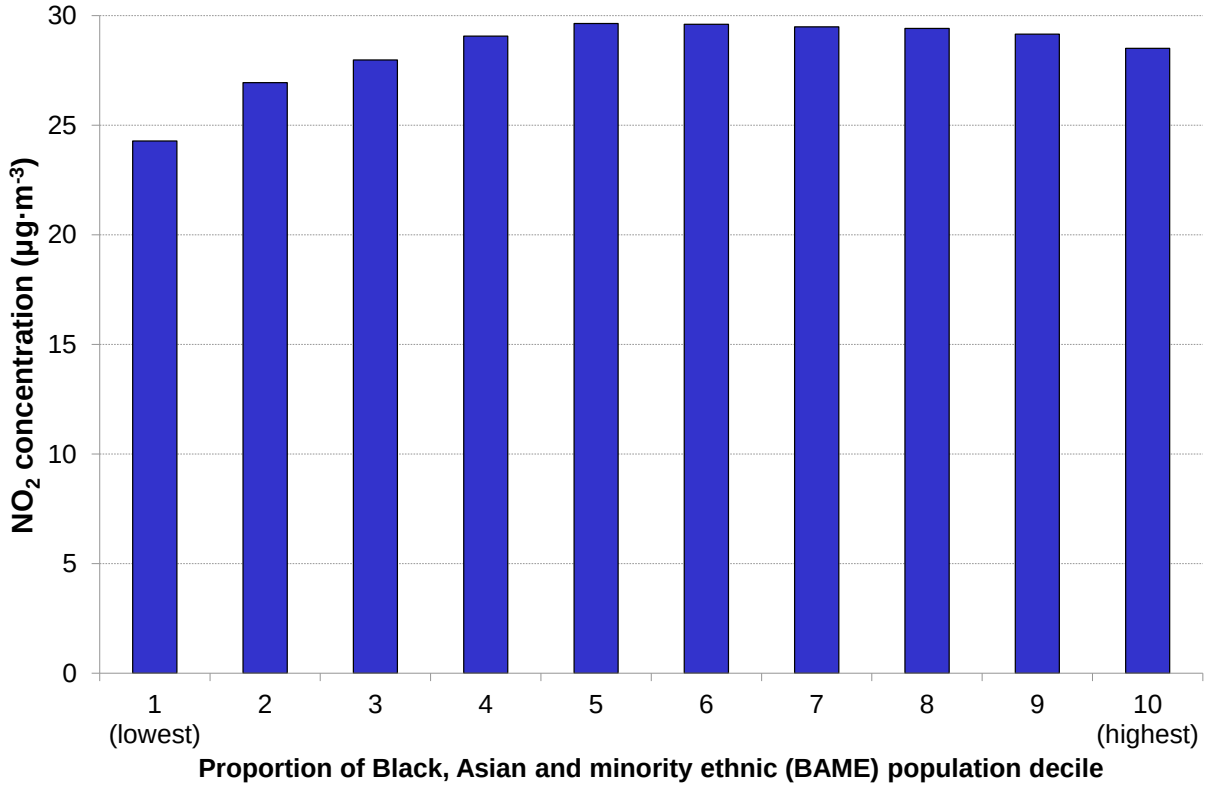
The graph shows that LSOAs with the lowest proportion of BAME population (first decile) have the lowest NO_2 concentration levels compared to the mid and top deciles. In other words, LSOAs with mostly White residents are more likely to be exposed to lower levels of NO_2.

Figure 5.9 shows the intersection between the three highest deciles for the proportion of BAME population and NO_2 concentrations above the WHO interim guidelines. The shaded area accounts for 34.1 per cent of the London population (2.8 million people in 2011).

A combination of all datasets (figure 5.10) allows a view of those areas in London with the 30 per cent most deprived LSOAs, 30 per cent of LSOAs with the highest proportion of BAME people and Output Areas with NO_2 concentrations above the WHO limit ($20\mu g \cdot m^{-3}$). This shaded area accounts for 19.5 per cent of the London population (1.6 million people in 2011).

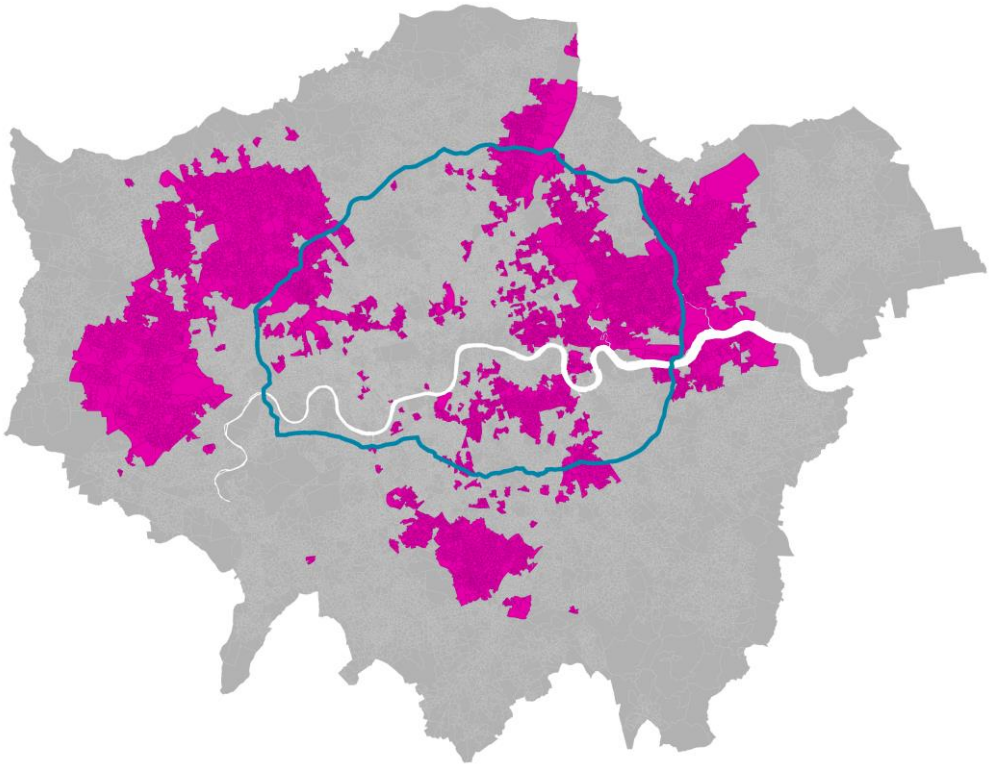
Given that most of the local pollution comes from road transport, it is also of interest to examine how this aligns with London's major roads. For this reason, the TfL Road Network of major roads is shown on the map in figure 5.10.

Figure 5.8 NO_2 concentrations by proportion of BAME population decile, 2019.



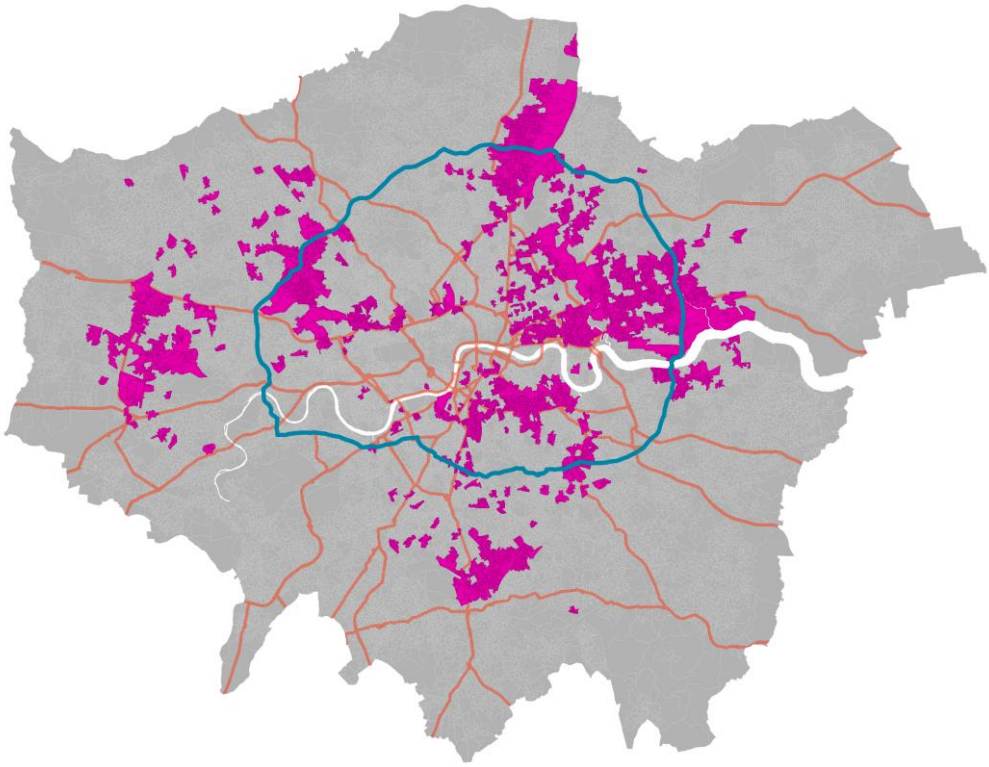
Source: TfL City Planning.

Figure 5.9 Spatial distribution of the areas with the 30 per cent highest proportion of BAME population and highest NO_2 concentrations.



Source: TfL City Planning.
Note: The boundary of the expanded Ultra Low Emission Zone (ULEZ) is shown on the map for reference.

Figure 5.10 Spatial distribution of the 30 per cent most deprived areas, areas with the 30 per cent highest proportion of BAME population and highest NO_2 concentrations, 2019.



Source: TfL City Planning.
Note: The TfL Road Network and the boundary of the expanded Ultra Low Emission Zone (ULEZ) are shown on the map for reference.

The relationship, however, is not straightforward, with some areas not being near the TfL Road Network. Further analysis explores the proximity of this population to the TfL Road Network, assuming a 150-metre buffer. Some 20.6 per cent (435,200 people) living near the TfL Road Network and in areas with NO_2 concentrations above 20µg·m^{-3} also live in the 30 per cent of LSOAs with the highest BAME population or in the 30 per cent most deprived LSOAs. This represents 5.3 per cent of the total London population in 2011.

5.4 The carbon challenge

In January 2022, the Mayor announced the aim to bring forward the 2050 zero carbon target published in the London Environment Strategy to a net-zero target for 2030. The London Net Zero 2030: An Updated Pathway report outlines that meeting this ambitious target will require significant emission reductions across London, including from road transport.

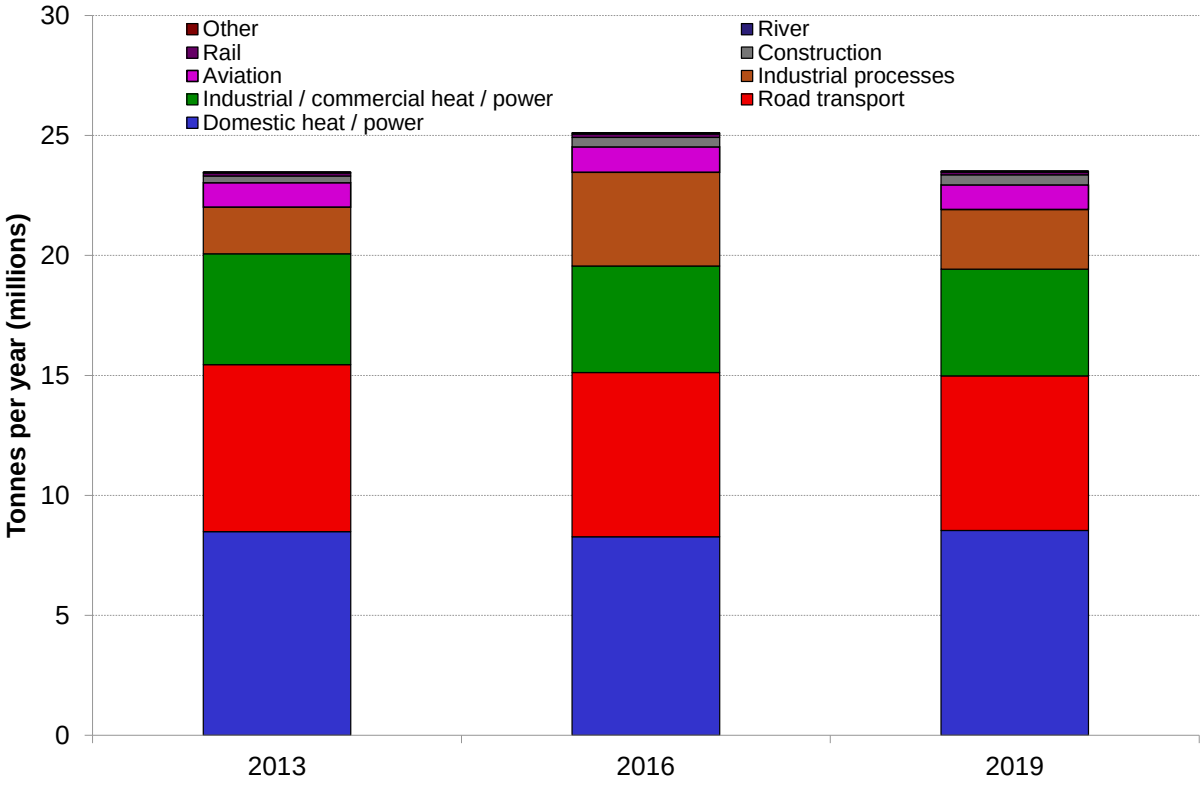
To understand the level of carbon dioxide emissions reduction required to meet a 2030 net-zero target, and the potential ways to achieve this, the Greater London Authority commissioned Element Energy to undertake a study (Analysis of a Net Zero 2030 Target for Greater London) to understand scenarios for achieving this.

In each of the four scenarios there were residual emissions to be offset ranging from 14 per cent to 30 per cent. The Mayor’s preferred option (the Accelerated Green scenario) would require a 27 per cent reduction in car vehicle kilometres. It is clear, therefore, that there is a need to understand how road transport contributes to London’s overall carbon dioxide emissions, the components of road transport emissions and how this varies across London.

Road transport carbon dioxide emissions

More than 80 per cent of London’s carbon dioxide emissions are from three sources: road transport, domestic heat/power, and industrial/commercial heat/power, as shown in figure 5.11.

Figure 5.11 Greater London CO_2 emissions by source, 2013-2019.



Source: London Atmospheric Emissions Inventory.

Carbon dioxide emissions in London increased by seven per cent in 2016 compared to 2013 and fell by six per cent in 2019 compared to 2016; so that overall carbon dioxide emissions in London are 0.2 per cent higher in 2019 than they were in 2013.

In 2019, road transport accounted for 27 per cent of London’s carbon dioxide emissions. River and rail transport accounted for 0.2 per cent and 0.4 per cent respectively.

London’s road transport emissions fell by two per cent between 2013 and 2016 and by a further six per cent between 2016 and 2019. While this means that road transport as a proportion of overall carbon dioxide emissions in London is reducing, it is clear that addressing emissions from road transport is crucial to meeting the Mayor’s 2030 net-zero target, as only domestic heat/power accounts for a larger proportion of overall carbon dioxide emissions (36 per cent).

It is estimated that 6.4 million tonnes of carbon dioxide emissions were generated by road transport in 2019. By 2030, our trajectory shows that road transport carbon dioxide emissions need to reduce by 29 per cent, to 4.2 million tonnes per year, to meet the Mayor’s target (see also figure 5.16 below).

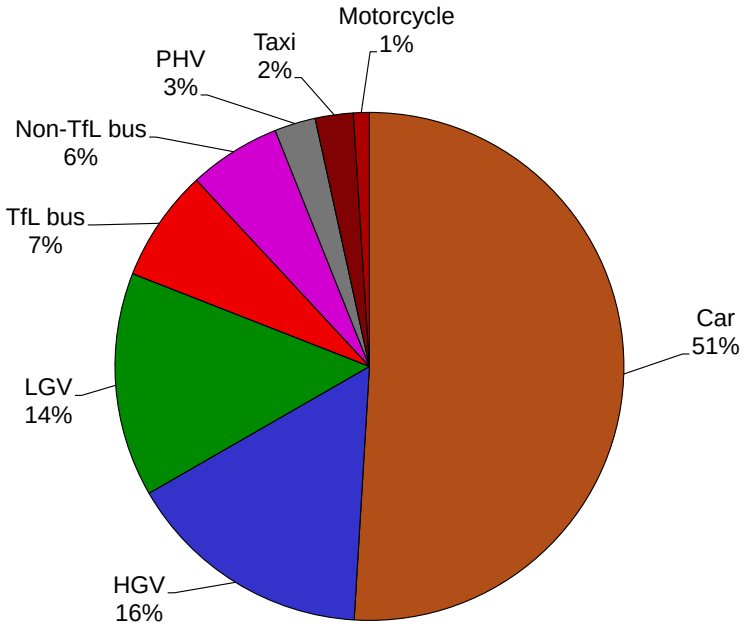
Between 2013 and 2019 emissions from road transport fell by eight per cent, therefore it is clear that there is a need for an acceleration of the emission reductions over the years up to 2030. This will require a significant decrease in vehicle kilometres, as well as a greater shift towards cleaner vehicles.

Carbon dioxide emissions by vehicle type

As shown in figure 5.12, cars contribute the greatest proportion to road transport emissions (51 per cent), followed by heavy goods vehicles (HGVs, 16 per cent) and light goods vehicles (LGVs, 14 per cent). However, cars comprise a higher proportion of vehicle traffic. Therefore, per mile, goods vehicles contribute disproportionately to carbon dioxide emissions.

Emissions from cars (including private hire vehicles) have also been reducing more quickly than for other vehicle types, by eight per cent between 2016 and 2019, compared to two per cent for HGVs and one per cent for LGVs over the same period. This is in part due to the transition towards cleaner vehicles as a result of schemes such as the ULEZ, as well as to a reduction in car trips over time.

Figure 5.12 London’s road transport CO_2 emissions by vehicle type, 2019.



Source: London Atmospheric Emissions Inventory.

Carbon dioxide emissions by location

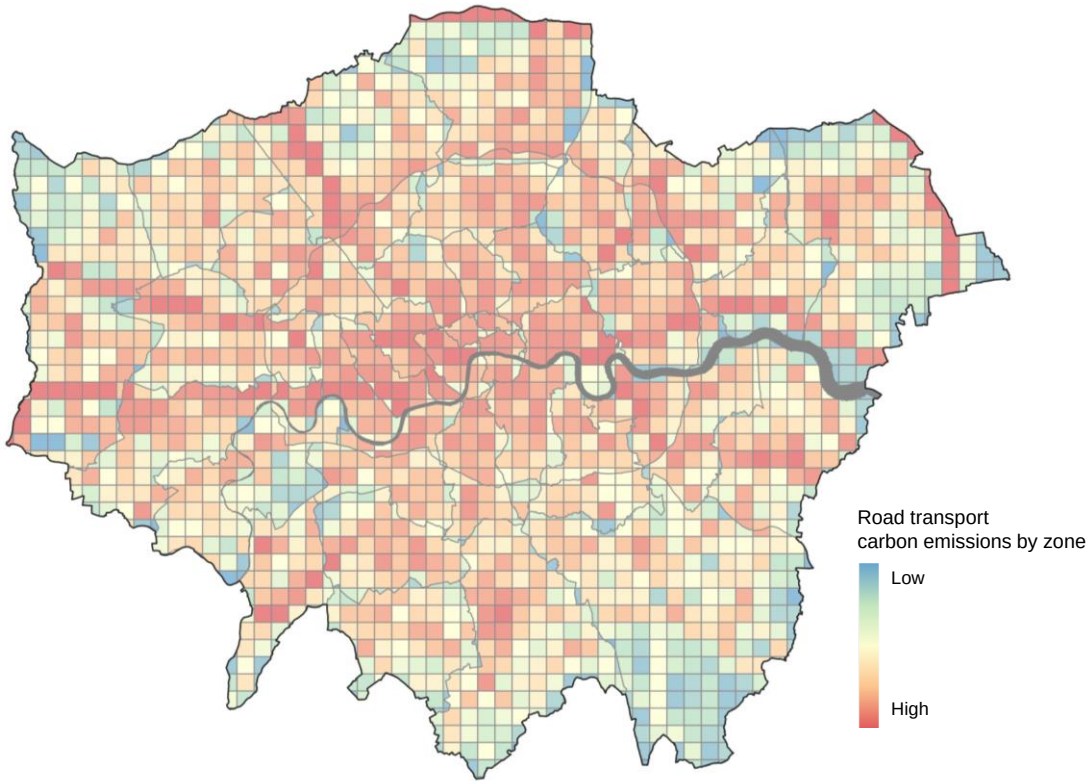
In 2019, three per cent of carbon dioxide emissions from road transport were generated in central London, 33 per cent in inner London and 64 per cent in outer London, broadly in line with the vehicle kilometres driven in each area.

While it is expected that a higher proportion of emissions will be generated in outer London due to its greater size, figure 5.13 shows that the areas (one kilometre by

one kilometre grid squares) that generate the greatest road transport emissions tend to be in central and inner London and along radial routes like the A4, A40 and A13.

In outer London, locations in and around town centres such as Croydon, Romford and Bexleyheath also generate a higher proportion of road transport carbon dioxide emissions than other outer London areas, reflecting people accessing the activities and amenities in these locations, with many travelling by car.

Figure 5.13 Road transport CO_2 emissions by 1km x 1km grid square, 2019.



Source: London Atmospheric Emissions Inventory.

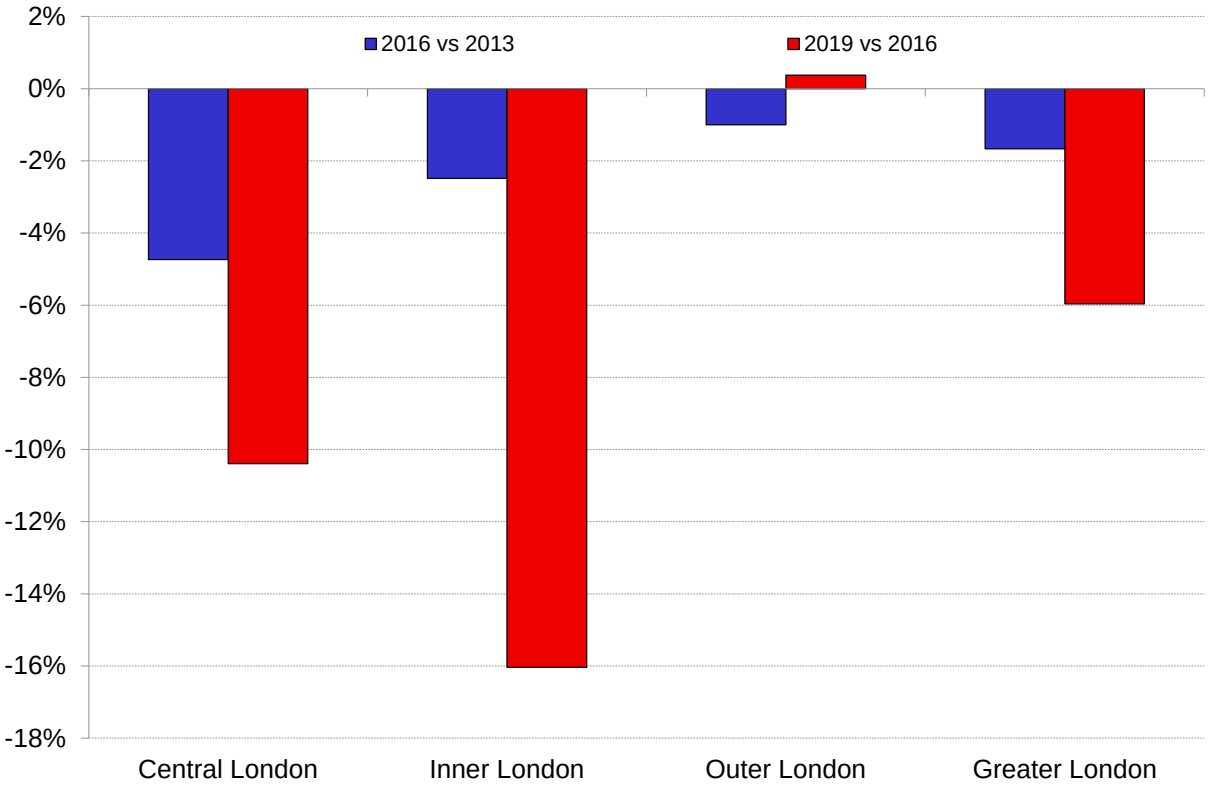
Carbon dioxide emissions from road transport decreased in central and inner London by 10 per cent and 16 per cent respectively between 2016 and 2019 (figure 5.14). Over the same period road transport emissions in outer London increased by 0.4 per cent.

Road transport emission reductions in central and inner London partly reflect the delivery of the central London ULEZ, driving an increase in the switch to cleaner vehicles, as well as policies to encourage travel by active, efficient and sustainable modes.

Variation in emission reductions is also evident at borough level. Figure 5.15 shows change in carbon dioxide emissions from road transport between 2016 and 2019.

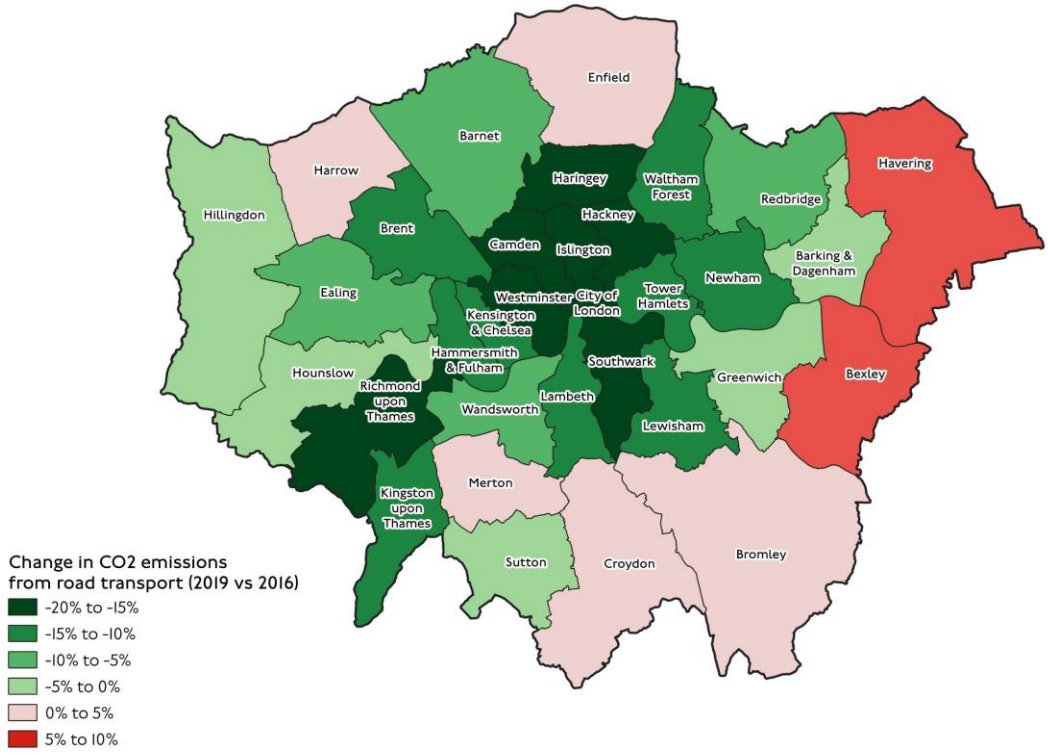
The greatest reduction in emissions was in the City of London and Camden, with reductions of 19 per cent and 18 per cent respectively. Most inner London boroughs saw decreases of carbon dioxide emissions from road transport of more than 10 per cent. However, in some outer London boroughs emissions from road transport increased, with the greatest increases in Bexley (10 per cent) and Havering (seven per cent).

Figure 5.14 Change in road transport CO_2 emissions by area, 2016 vs 2013 and 2019 vs 2016.



Source: London Atmospheric Emissions Inventory.

Figure 5.15 Change in road transport CO_2 emissions by borough, 2019 vs 2016.



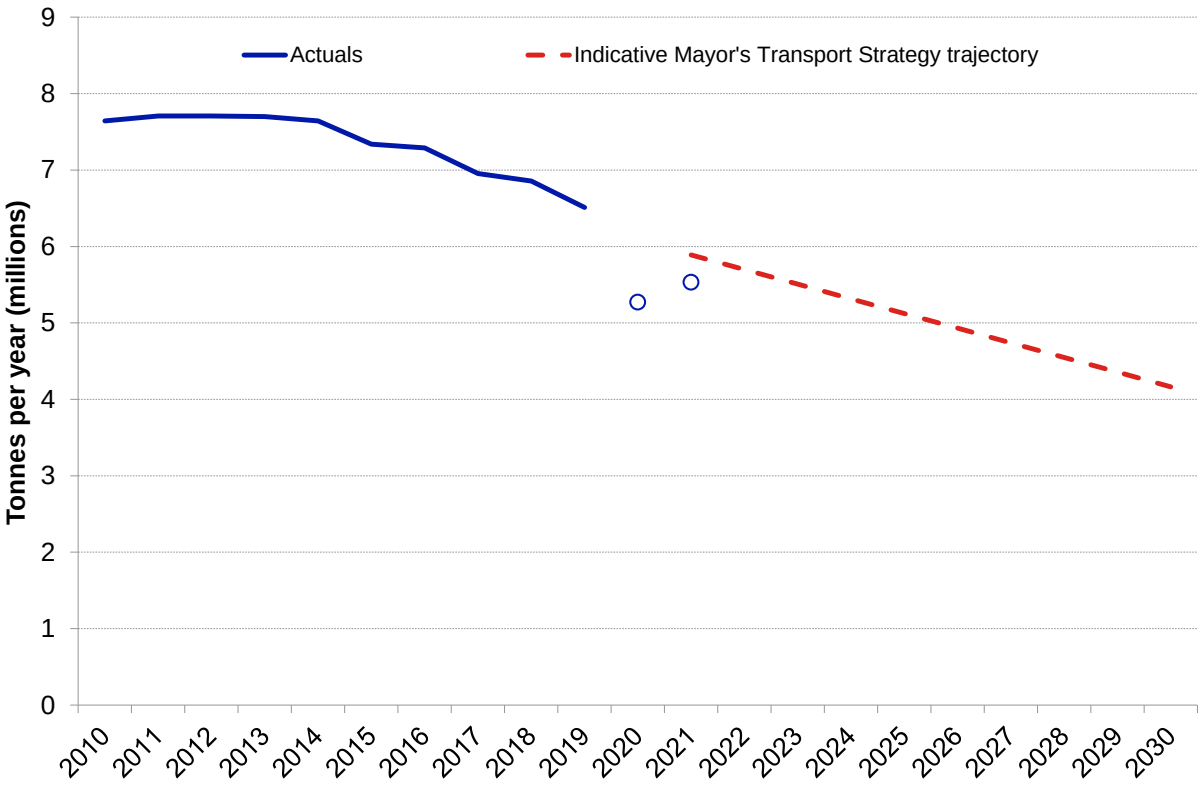
Source: London Atmospheric Emissions Inventory.

Provisional estimates of London’s road transport carbon dioxide emissions during 2020 and 2021

London’s road transport carbon dioxide emissions are a key indicator of progress towards the Mayor’s Transport Strategy aims.

Figure 5.16 shows estimated carbon dioxide emissions since 2010 alongside the estimated trajectory required to meet the Mayor’s aims up to 2030. The years 2020 and 2021, both of which were significantly affected by the coronavirus pandemic, are provided as provisional estimates at this stage.

Figure 5.16 CO_2 road transport emissions in London, 2010-2030.



Source: TfL City Planning.

Conclusion

Carbon dioxide emissions in London need to reduce significantly to meet the Mayor’s target of a net-zero London by 2030.

Addressing carbon dioxide emissions generated by road transport will be central to meeting this target, since road transport is the second largest contributor to London’s carbon dioxide emissions. Analysis of road transport carbon emissions data shows that:

- Carbon dioxide emissions from road transport have been reducing. Between 2016 and 2019 emissions reduced by six per cent. However, this pace of reduction needs to be accelerated considerably to meet the 2030 net-zero target.
- Cars and freight vehicles generate the greatest proportion of road transport carbon dioxide emissions, although freight vehicles are more polluting per mile and emissions from LGVs and HGVs have not been falling at the same rate as for other vehicle types.

- Outer London generates the highest proportion of carbon dioxide emissions from road transport. However, when accounting for size, central and inner London, as well as the strategic radial routes generate a disproportionate amount of carbon dioxide emissions.
- Reductions in road transport carbon dioxide emissions since 2016 have been greater in central and inner London, with most boroughs reducing emissions by more than 10 per cent. In outer London, however, the picture is mixed with some boroughs (Bexley and Havering) seeing increases of more than five per cent over the same period.
- Both a reduction in vehicle kilometres and an acceleration of the transition towards cleaner vehicles will be needed to significantly reduce the contribution of road transport to London’s carbon dioxide emissions and minimise the proportion of emissions which require offsetting.

5.5 Supporting the transition to electric vehicles in London

London’s 2030 Electric Vehicle Infrastructure Strategy

TfL’s Electric Vehicle Infrastructure Strategy, published in December 2021, provides an update to the pioneering 2019 TfL Electric Vehicle Infrastructure Delivery Plan and reflects stakeholder engagement on the summary document published in October 2021.

The strategy sets out the latest projections for London’s public electric vehicle charging infrastructure requirements by 2025 and further to 2030. This includes between 20,000 and 37,000 charge points by 2025 (with between 1,600 and 2,600 being rapid) and between 40,000 and 60,000 charge points by 2030, of which between 3,000 and 4,000 will be rapid.

Electric vehicles in London’s fleet

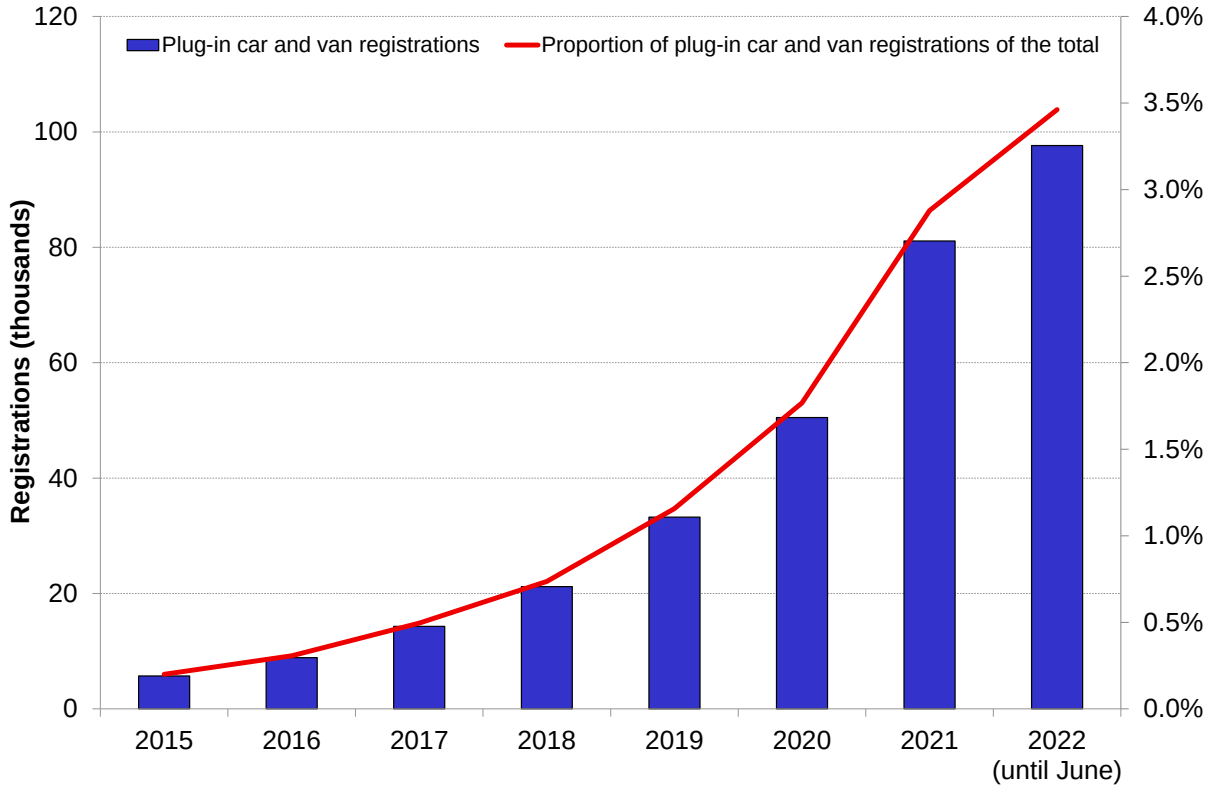
The number of electric vehicles in London is increasing rapidly.

According to data from the Department for Transport, there were 28,000 new plug-in vehicles registered in London for the first time in 2021. This includes battery-electric vehicles (BEVs) as well as plug-in hybrid electric vehicles (PHEVs), and in total these make up 20 per cent of all new vehicles registered, up from 14,000 (nine per cent) in 2020.

The proportion of plug-in cars and vans in London is also increasing, comprising three per cent of vehicles in 2021, up from almost two per cent in 2020, and is still growing, approaching 3.5 per cent as of mid-2022 (figure 5.17).

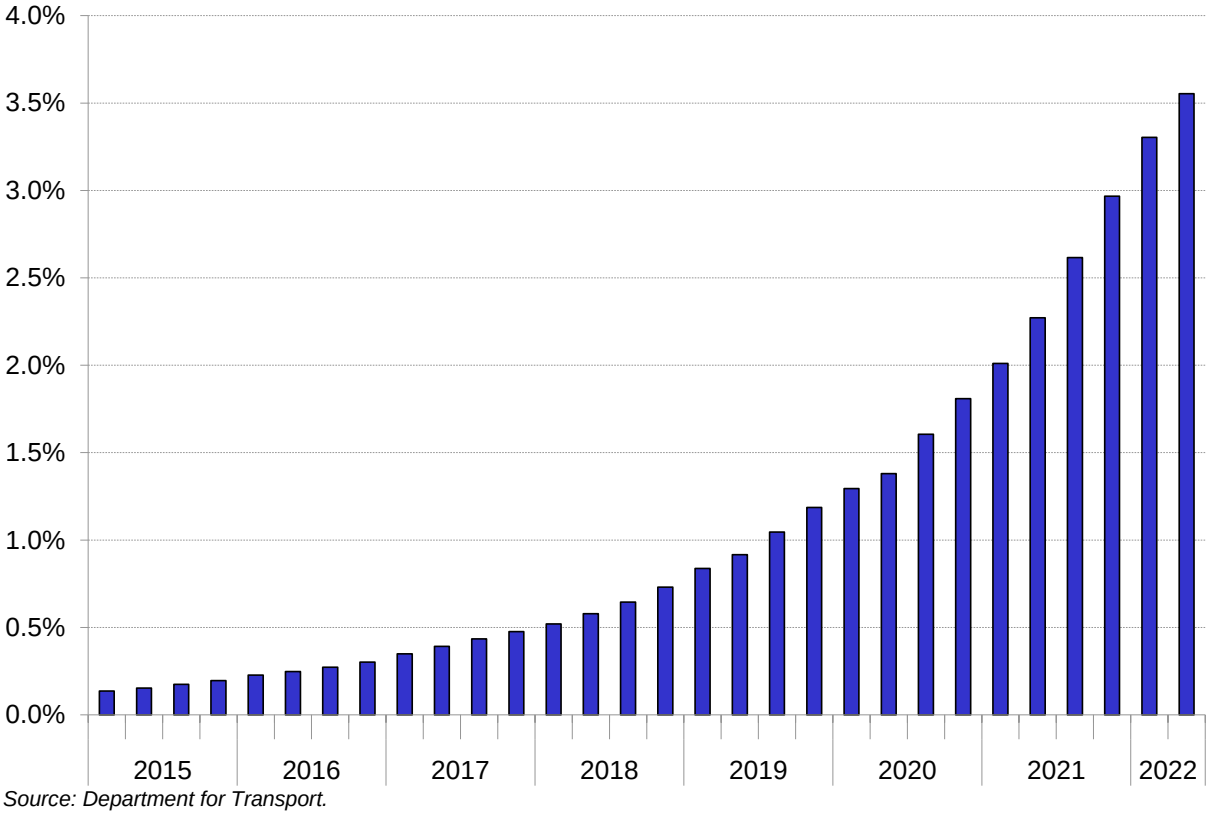
Nationally, plug-in vehicles represented 15 per cent of all new vehicle registrations in 2021, up from nine per cent in 2020.

Figure 5.17 Cumulative first-time registrations of plug-in electric cars and vans in London and proportion of total vehicle fleet in London, 2015-2022.



Source: Department for Transport.

Figure 5.18 Proportion of battery-electric vehicles in London's vehicle fleet by quarter, 2015-2022.



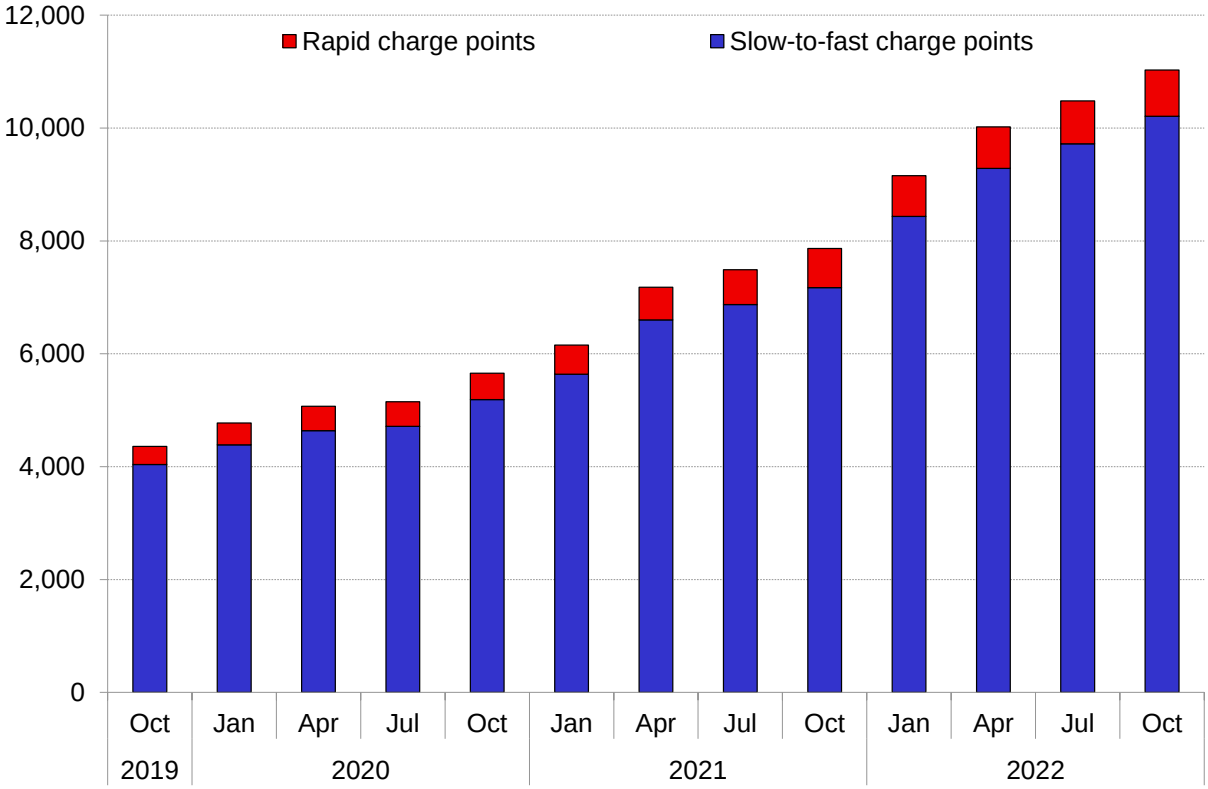
Source: Department for Transport.

As more fully electric cars come into the market with larger batteries and longer ranges to meet consumer demands for zero-emission vehicles, the number of new BEV registrations is starting to overtake the number of new PHEV registrations, suggesting that Londoners are beginning to choose plug-in electric vehicles in larger numbers over traditional internal combustion engine vehicles.

Provision of electric vehicle charging infrastructure

The provision of charging infrastructure in London has increased considerably over the last two years (figure 5.19), thanks in part to significant public sector investment.

Figure 5.19 Number of electric vehicle charge points by type, 2019-2022.



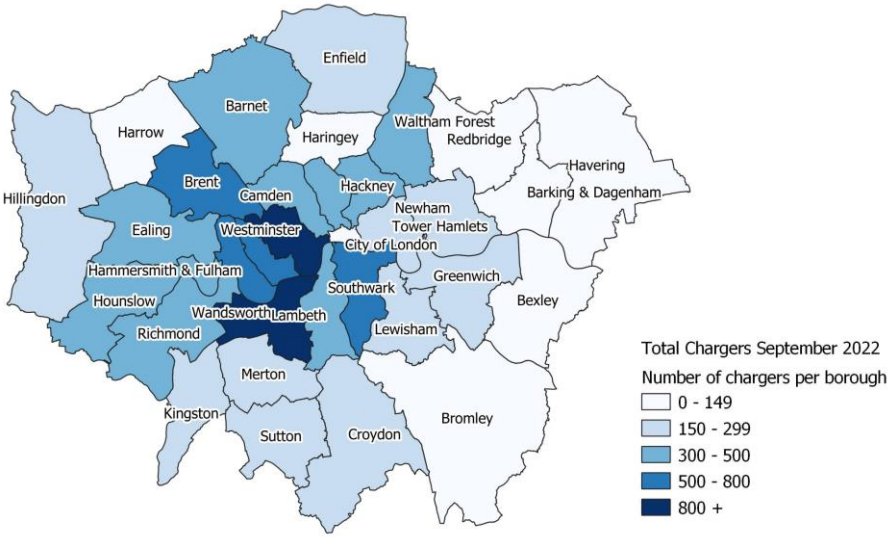
*Source: Zap-Map (*https://www.zap-map.com).

Progress has also been made on the ambition for a rapid hub in every sub-region of London by 2025. As of October 2022, the public sector has supported the opening of hubs at Glass Yard in southeast London, Stratford in east London and at Baynard House in central London.

Although the delivery of infrastructure is accelerating, further acceleration is needed, using a combination of private and public sector funding.

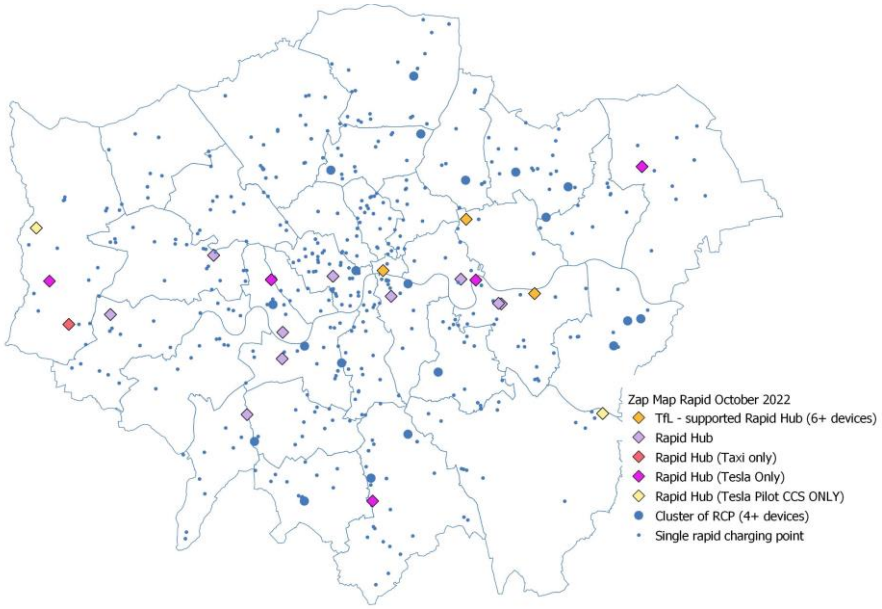
The spatial provision of infrastructure across London is varied, illustrative of the demand-led approach to delivery of slow-to-fast charge points to date (figures 5.20 and 5.21).

Figure 5.20 Distribution of charge points (all types) by borough, Sep 2022.



Source: Zap-Map (https://www.zap-map.com).

Figure 5.21 Location of Rapid Charge Points and Rapid Charging Hubs, Sep 2022.



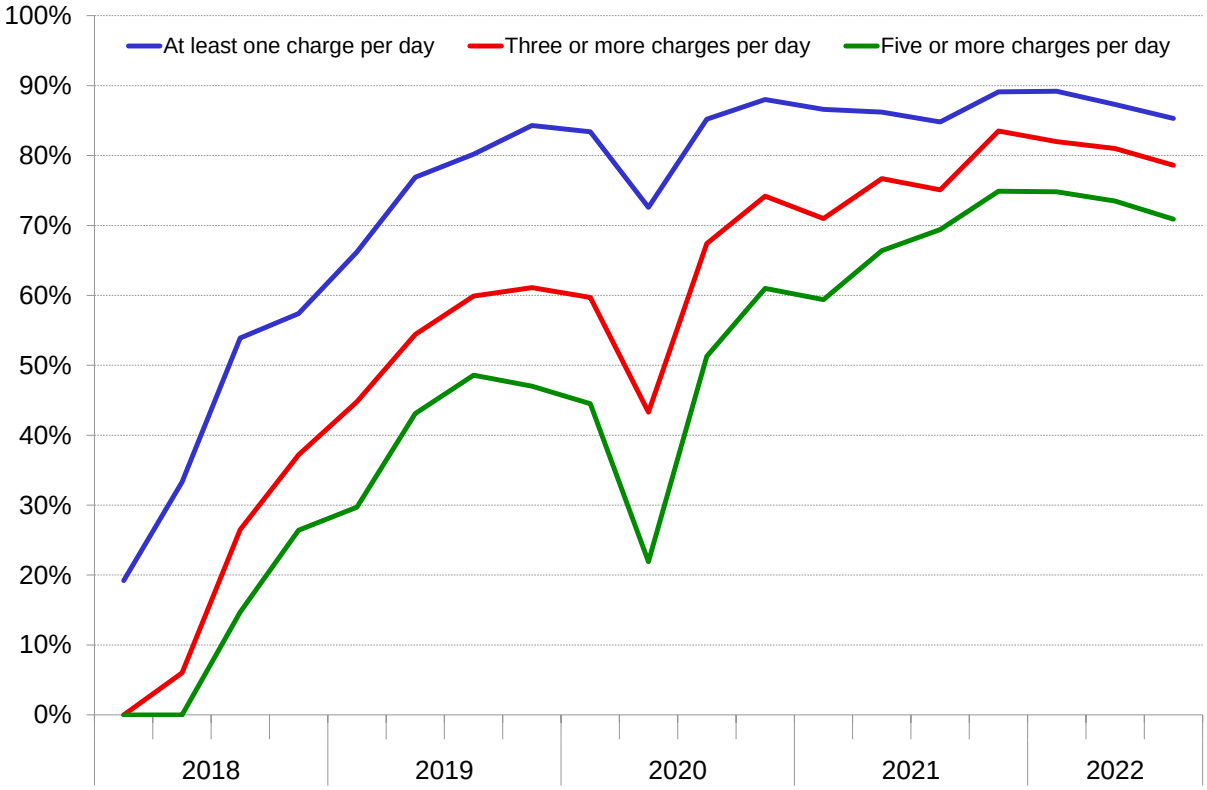
Source: Zap-Map (https://www.zap-map.com).

Rapid charge points: delivery and utilisation

Travel in London report 14 summarised various aspects of the delivery and utilisation of rapid charge points in London. Delivery of these has continued, with 820 rapid charge points available in London for public use as of September 2022. Westminster continues to outpace most boroughs in terms of the delivery of rapid charge points.

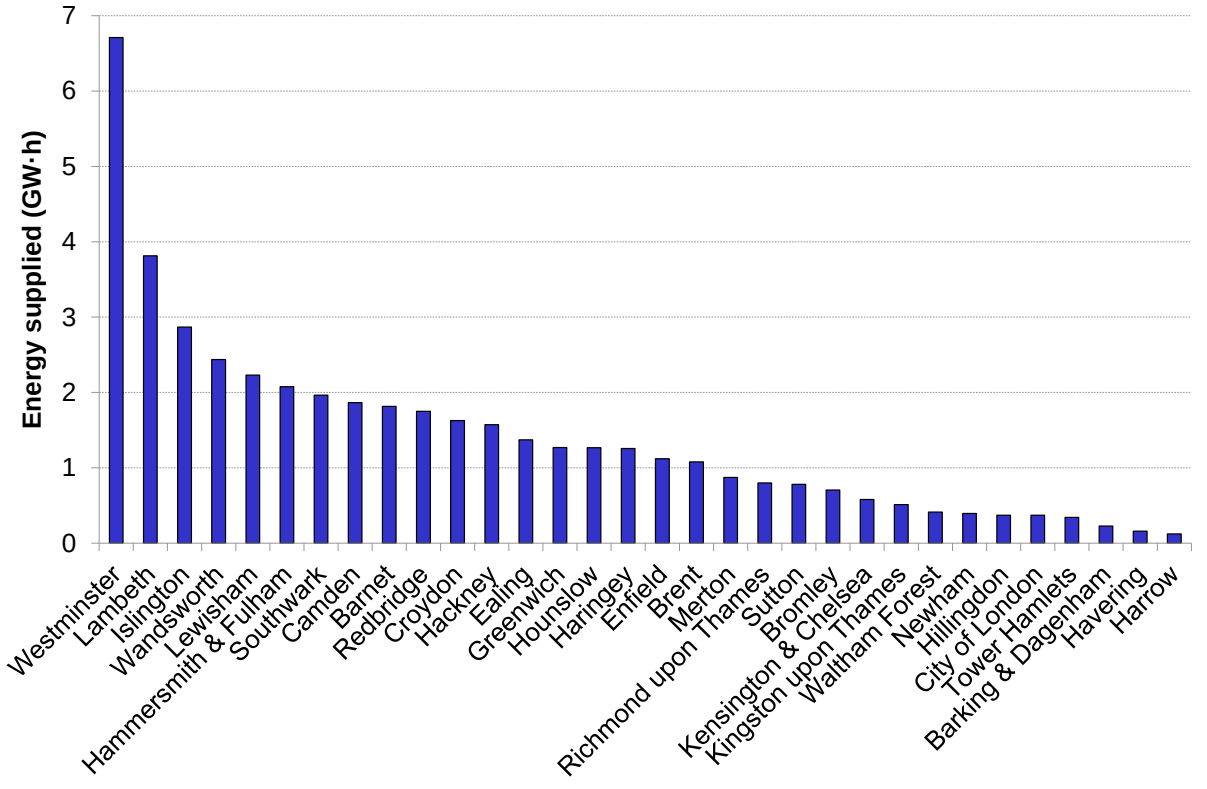
Figure 5.22 shows the percentage of TfL-involved rapid charge points which recorded an average number of charges per day over specific thresholds.

Figure 5.22 Utilisation of TfL-involved rapid charge points, by quarter, 2018-2022.



Source: TfL City Planning.

Figure 5.23 Energy supplied by TfL-funded rapid chargers, by borough, 2018-2022.



Source: TfL City Planning.

The data is presented quarterly from 2018 up to the end of September 2022. It shows a steep increase in the utilisation rate between 2018 and 2019, followed by a significant dip in quarter 2 2020 (April-June) due to the first lockdown of the coronavirus pandemic, and a subsequent recovery. Since then, utilisation has steadily increased although a small decrease was observed in the latest two quarters of 2022. This might be due to the continued increase in the number of charge points across London (including rapid charge points for which TfL has not been involved), which could impact the utilisation rate of those that TfL is involved in.

Figure 5.23 shows the breakdown of energy supplied through TfL-involved rapid charge points by borough. The graph shows that inner London and specifically central London boroughs tend to have more concentrated rapid charge points usage, with Westminster recording almost twice as much energy supplied as any other borough. This is expected given the very high provision of charging infrastructure in Westminster compared to the rest of London and its proximity to the central London Congestion Charge zone, with an exemption for driving a zero-emission at the tailpipe vehicle.

6. London's road traffic

6.1 Introduction

This chapter looks at recent trends and developments relating to motorised road traffic in London. It includes a review of the impacts of recent changes to the Congestion Charge scheme in central London and aspects of the growing sector of shared and micromobility in London.

6.2 Overall road traffic trends in London

Vehicle kilometre estimates for London from the Department for Transport

The most direct measure of the amount of road traffic in London is the annual vehicle kilometre estimate produced by the Department for Transport (DfT) as part of its annual Traffic Estimates for Great Britain.

Over the past decade, this indicator had suggested slowly declining overall traffic levels in London, which was generally in accord with the trends shown by TfL's monitoring over this period.

In 2018, however, the DfT embarked on a regular decennial benchmarking exercise for the minor roads (only) element of the Great Britain road network, which resulted in revisions to the minor road traffic estimates for the years 2010 to 2019.

London had one of the highest benchmark adjustments in this exercise and this produced traffic estimates showing a 44 per cent increase for traffic on London's minor roads between 2010 and 2019.

Notably, however, the volume estimates for traffic on London's major roads remained broadly unchanged, and the available independent data showed no evidence of an (observed) year-on-year increasing trend in minor road traffic over the preceding decade.

Department for Transport's review of minor roads estimation methodology

In view of the magnitude of this change, the DfT undertook a review of its minor roads estimation methodology, in which TfL participated.

The review introduced new developments to the estimation of minor road traffic estimates for 2000 to 2019 and its outcomes can be found on the Road traffic estimates in Great Britain: 2021 website.

The review makes several key changes to the traffic volume data series, which are:

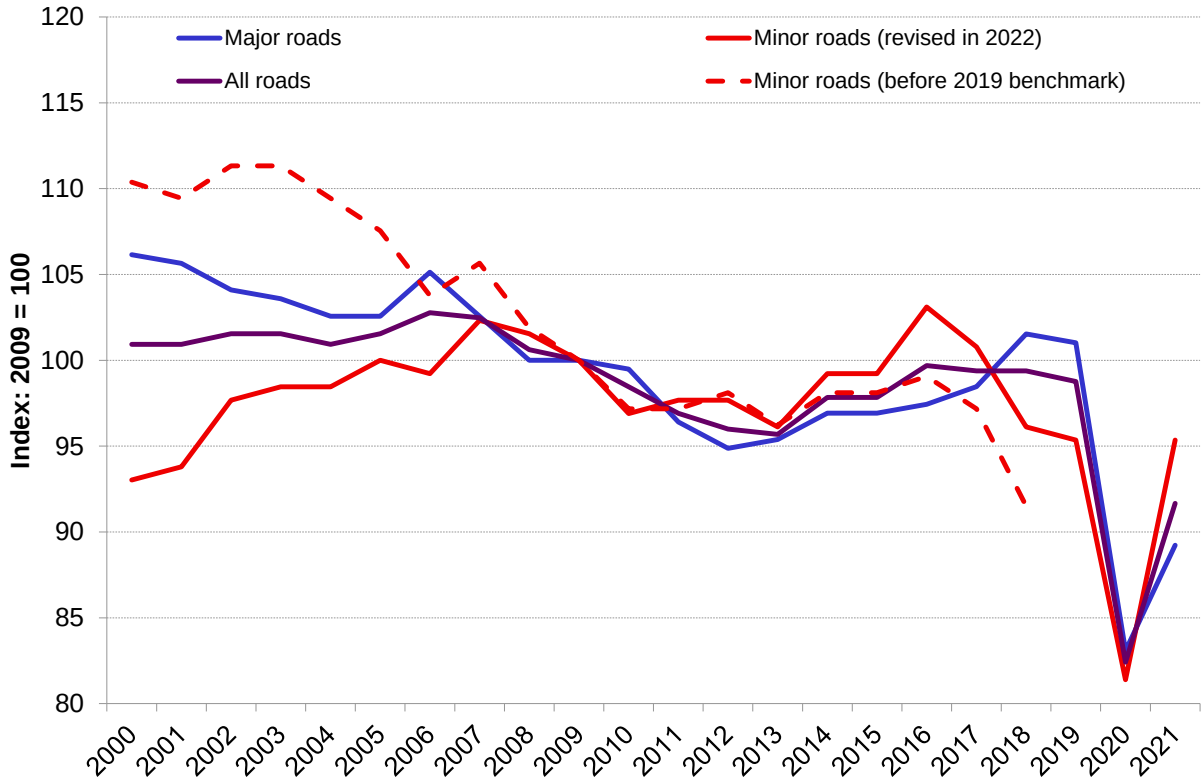
- Minor road traffic in London in 2018 is now estimated to be 27 per cent higher, in terms of total vehicle kilometres driven, than the equivalent originally published estimate (prior to the 2019 benchmarking exercise).
- This change is much smaller than previously estimated as part of the 2019 benchmark (see Travel in London report 14). However, it still represents a substantial upwards revision to this component of road traffic in London.

- The DfT has not revised its traffic estimates for major roads and this component of the traffic estimates thus provides a consistent long-term series.
- The DfT has revised the long-term back series of these minor road data up to 2000. In contrast to the original 2019 benchmarking estimates, the long-term trend in minor road traffic estimated by these revisions is broadly flat, and this is in accord with TfL's data and other independent sources.
- However, the revisions have introduced a discontinuity in the series at year 2000, as it was not possible to revise before that date. For much of the past decade, the revised estimates place total traffic in London of the order of seven to nine per cent higher than previously estimated.
- In the estimates published before 2019, minor road traffic was estimated at around 33 per cent of all road traffic in London. The latest estimates have increased this proportion (of a correspondingly larger total) to around 40 per cent.

Revised traffic volume estimates for London

Figure 6.1 shows the revised long-term trend for vehicle kilometres driven in London.

Figure 6.1 Revised trend for vehicle kilometres driven in London, indexed annual totals, 2000-2021.



Source: Department for Transport.

- In line with trends previously reported in Travel in London reports, the total amount of traffic in London slowly declined over the last decade. This trend has been broadly similar across both major and minor roads. In 2020 and 2021 the impact of the pandemic is clearly visible.
- In 2021 it is estimated that there were 29.7 billion kilometres driven by motorised vehicles within Greater London. On a consistent basis this was nine per cent

higher than in 2020 and seven per cent lower than in 2019 (before the pandemic).

Table 6.1 shows the impact of these revisions to the historic estimates of total road traffic. Comparisons between the latest estimates and the estimates published prior to 2019 are provided for years where they apply.

Table 6.1 Road traffic (billion vehicle kilometres) in London by road type, all motor vehicles, 2000-2021.

Year	Major roads	Minor roads	All roads	Difference to estimates published in 2018
2000	20.7	12.0	32.7	0.7%
2001	20.6	12.1	32.7	1.4%
2002	20.3	12.6	32.9	2.2%
2003	20.2	12.7	32.9	3.0%
2004	20.0	12.7	32.8	3.7%
2005	20.0	12.9	32.9	4.8%
2006	20.5	12.8	33.3	5.7%
2007	20.0	13.2	33.2	6.6%
2008	19.5	13.1	32.6	7.6%
2009	19.5	12.9	32.4	7.6%
2010	19.4	12.5	31.9	7.6%
2011	18.8	12.6	31.4	7.8%
2012	18.5	12.6	31.1	7.7%
2013	18.6	12.4	31.1	7.9%
2014	18.9	12.8	31.7	8.0%
2015	18.9	12.8	31.6	8.2%
2016	19.0	13.3	32.3	9.5%
2017	19.2	13.0	32.3	9.3%
2018	19.8	12.4	32.2	8.9%
2019	19.7	12.9	32.0	n/a
2020	16.2	10.5	26.7	n/a
2021	17.4	12.3	29.7	n/a

Source: Department for Transport.

For much of the past decade, the revised estimates place total traffic in London of the order of seven to nine per cent higher than previously estimated. The difference wholly arises from the changes to the methodology for the minor road component of the total, and the estimates for 2020 and 2021 should therefore be seen in that context.

It is important to recognise that the revisions to the DfT's estimates are mostly due to methodological improvements in the calculation of benchmark estimates for 2009 and 2019, and not due to a change in observed year-on-year trends.

Nevertheless, the estimate of London's road traffic volume, expressed as vehicle kilometres, is higher than previously understood (from the estimates published prior to 2019). This has potential implications for several areas of our work, for example carbon dioxide emissions reduction targets, and TfL will be working through these over the coming months.

6.3 Road traffic trends by vehicle type and area

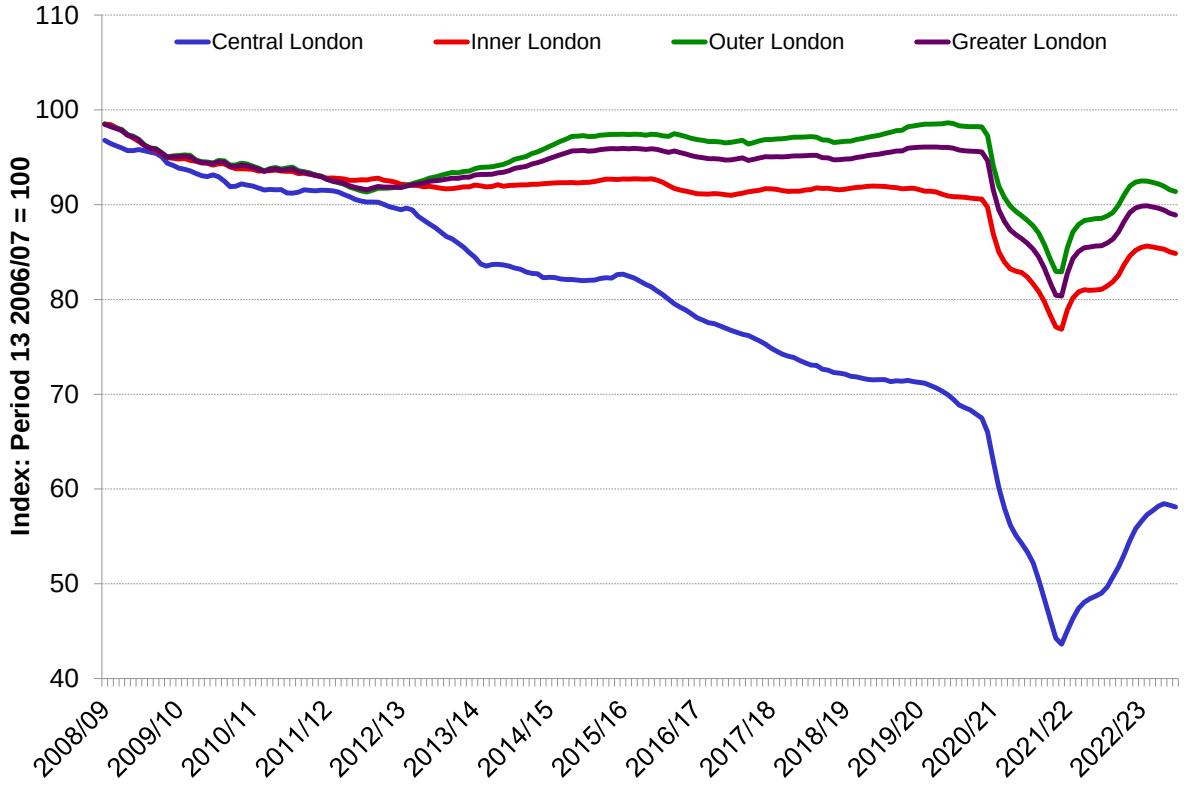
TfL's indicators of overall traffic trends in London

TfL's indicators of traffic in London provide robust trend-based estimates of traffic volumes. Between 2018 and 2019 they continued to show a relatively stable overall picture. In 2020, however, traffic volumes were significantly impacted by the coronavirus pandemic.

Figure 6.2 shows the effects of the pandemic restrictions in early 2020, with traffic levels dropping across all areas of London, although the decline was much sharper in central London. During 2021, traffic levels increased gradually before plateauing across all areas at a lower level than before the pandemic, about seven per cent below the 2019 traffic levels in the latest period.

Traffic flows in both inner and outer London in autumn 2022 are around six to seven per cent below pre-pandemic levels, while flows in central London are around 15 per cent lower than in 2019.

Figure 6.2 Traffic flows by area, all motor vehicles, 13-period moving average, 2008/09-2022/23.

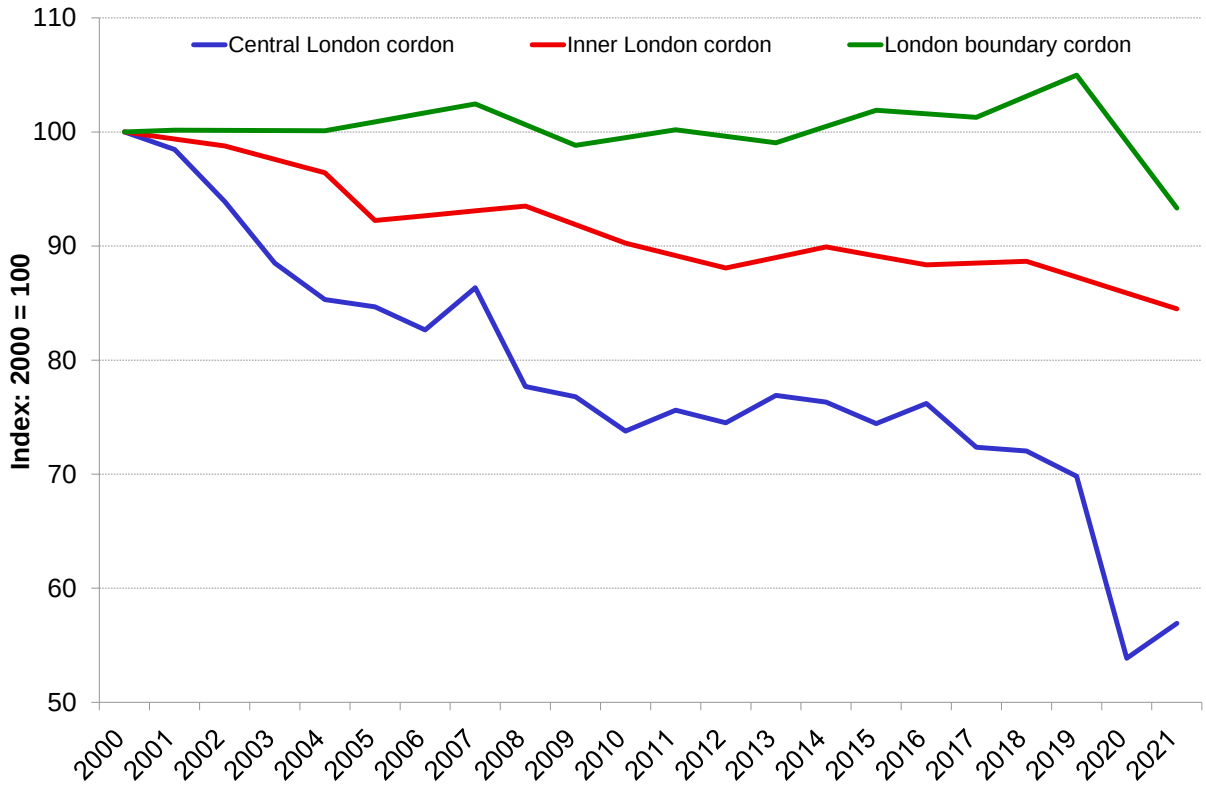


Source: TfL traffic data.

Traffic crossing TfL's strategic cordons

Trends in the number of motor vehicles crossing the three London strategic counting cordons provide another indicator of traffic volume, and they show a broadly similar pattern to other indicators (figure 6.3).

Figure 6.3 Daily motor vehicles crossing the strategic cordons, 2000-2021.



Source: TfL traffic data.

Between 2001 and 2019, and bearing in mind that not all cordons are surveyed every year (intermediate years are interpolated), the number of motor vehicles crossing the central cordon (enclosing a definition of central London which is neither aligned either with the Congestion Charge zone nor with the DfT definition) has fallen by 29.1 per cent.

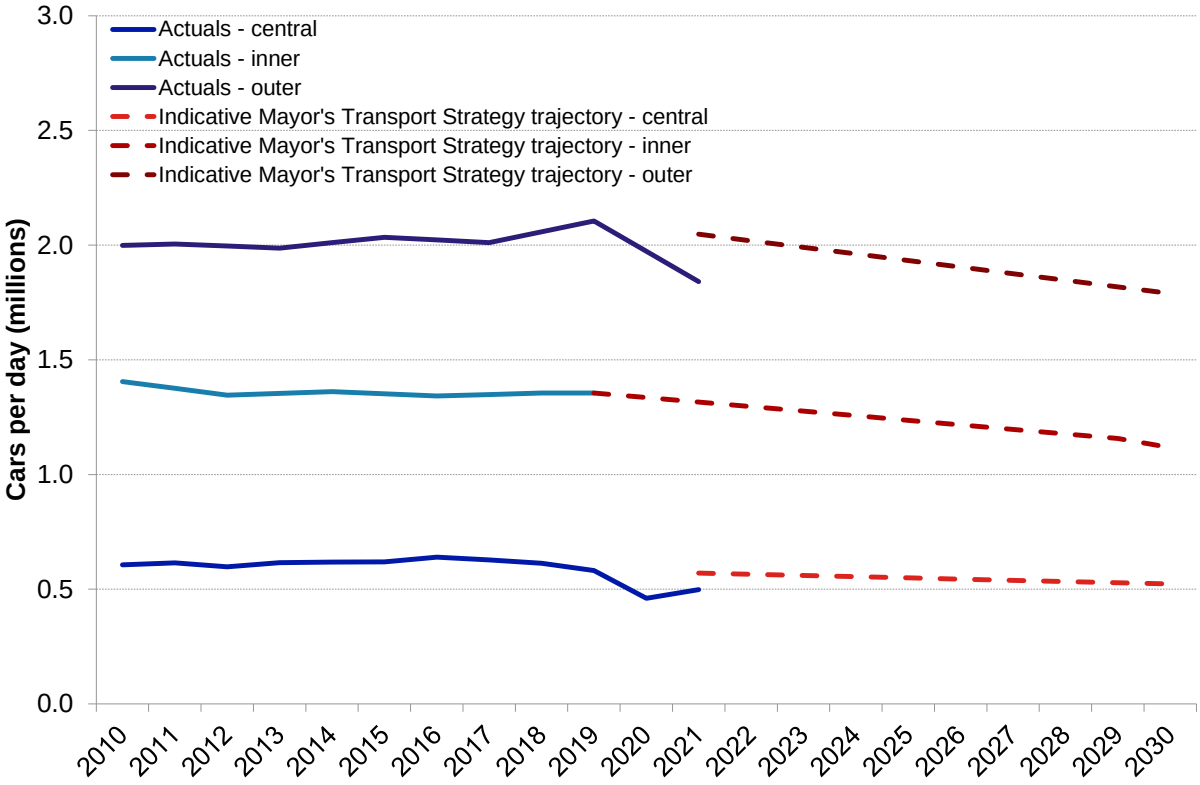
Across the inner cordon, the decline was 10.2 per cent between 2002 and 2018, while flows at the London boundary cordon have been relatively stable, with a net 4.8 per cent increase between 2001 and 2019.

The number of vehicles crossing the river Thames throughout Greater London has also declined, with 20.8 per cent fewer vehicles observed in 2018 than in 2000.

In considering cordon and screenline counts, however, it should be noted that there may be considerable variation locally from the trends quoted, as they include a wide range of locations with differing road network and traffic growth characteristics.

While 78 per cent of vehicles crossing the boundary cordon in 2019 were cars, growth has been strongest in light goods vehicles (LGVs). Since 2010, the number of cars crossing the boundary cordon increased by 5.3 per cent, while the number of LGVs increased by 13.0 per cent over the same period. Total flows across the three cordons were down by 0.6 per cent between 2009 and 2018.

Figure 6.4 Cars per day crossing the strategic cordons, 2010-2030.



Source: TfL traffic data.

This highlights the challenges in meeting the Mayor’s mode share target, with central and inner London showing a decline in traffic flows while flows across the London boundary cordon are increasing. This is particularly significant as more than 70 per cent of London’s traffic is in outer London.

Trends by vehicle type

These trends have not been the same across all vehicle types as shown in table 6.2.

The number of cars crossing the central and inner cordons declined over the decade, although car flows increased by five per cent at the London boundary cordon between 2011 and 2019.

In central London, the number of LGVs crossing the cordon has been relatively stable over the decade but has increased at both the inner and London boundary cordons, by seven per cent and 11.5 per cent respectively.

Trends in heavy goods vehicles (HGVs) crossing the cordons have been stable over the last 10 years, with virtually no change at both the inner London and London boundary cordons. However, HGV flows in central London have declined by almost 10 per cent.

Table 6.2 Daily number of motor vehicles (thousands) crossing the strategic cordons, by vehicle type, 2010-2022.

Cordon	Year	Cars	LGVs	HGVs	Total
Central	2010	606	179	51	1,133
	2015	619	181	52	1,143
	2019	581	178	46	1,072
	2020	460	153	35	827
	2021	498	147	30	874
Inner	2010	1,405	286	82	1,945
	2014	1,342	306	88	1,938
	2018	1,355	306	80	1,911
	2022	1,276	285	59	1,791
Boundary	2011	2,005	347	137	2,568
	2015	2,034	362	139	2,612
	2019	2,105	387	136	2,691
	2021	1,841	382	123	2,392

Source: TfL traffic data.

Traffic flows across all cordons are currently lower than before the pandemic.

Despite an increase in overall flows across the central cordon in 2021, goods vehicle flows continued to decline. Across the inner cordon, both LGV and HGV flows were down at a greater rate than that of cars. However, the opposite was true at the London boundary cordon between 2019 and 2021, with car flows down at a greater rate than goods vehicle flows.

This suggests that the return to normal from the pandemic has not been even across all areas of London and all vehicle types, with evidence showing that goods vehicle traffic is returning more slowly in central and inner London than car traffic.

6.4 Freight traffic entering the Congestion Charge zone in the morning peak

A specific aim of the Mayor's Transport Strategy is to reduce the number of goods vehicles (HGVs and LGVs) circulating in the central London Congestion Charge zone during the weekday morning peak by 10 per cent by 2026, from 2016 levels. This reflects pressures on the road network at this time and would help to reduce road danger.

Figure 6.5 shows the observed trend over recent years and sets this in the context of the nominal trajectory required to meet the target.

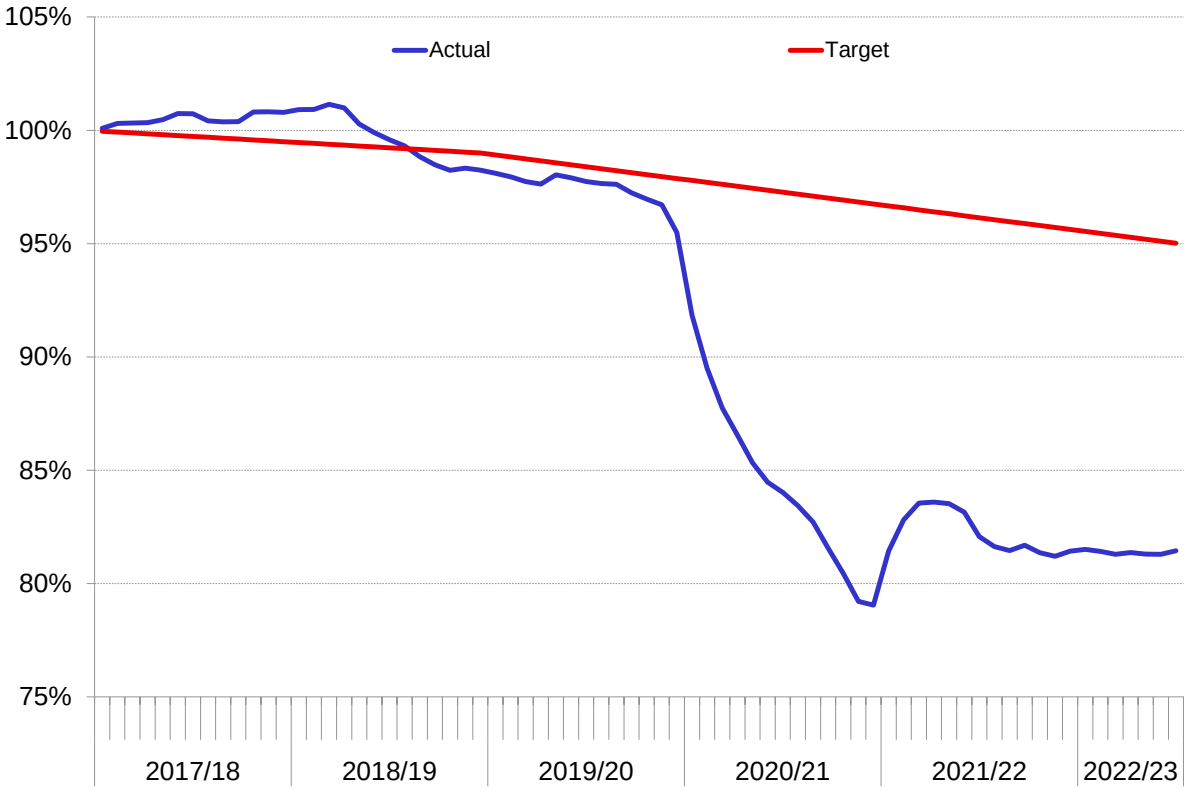
Although a degree of variability in the actual trajectory is to be expected, the overall trend was compatible with steady progress towards this aim throughout the latter half of 2018 and all of 2019.

During 2020, the impacts of the pandemic are apparent, with a reduction in freight vehicles entering the Congestion Charge zone throughout 2020.

By early 2021, the reduction in the number of freight vehicles was more than 20 per cent against the 2016 baseline. As restrictions were lifted the number of freight vehicles started to increase but has stabilised through 2022 at around 19 per cent below 2016 levels.

The current level remains well below the 2026 target, with little sign of an increase now that all pandemic-related restrictions have been lifted.

Figure 6.5 Freight vehicles entering the Congestion Charge zone compared to 2016, 13-period moving average, 2017/18-2022/23.



Source: TfL traffic data.

6.5 Focus on: fuel prices and traffic volumes

Trend in vehicle fuel prices

A particular aspect of the cost-of-living pressures emerging during 2022 has been rising energy prices.

Vehicle fuel prices were relatively stable at the start of 2022, with unleaded petrol prices increasing by around three per cent between the start of January and the end of February, from 144.8 pence per litre to 149.2 pence per litre.

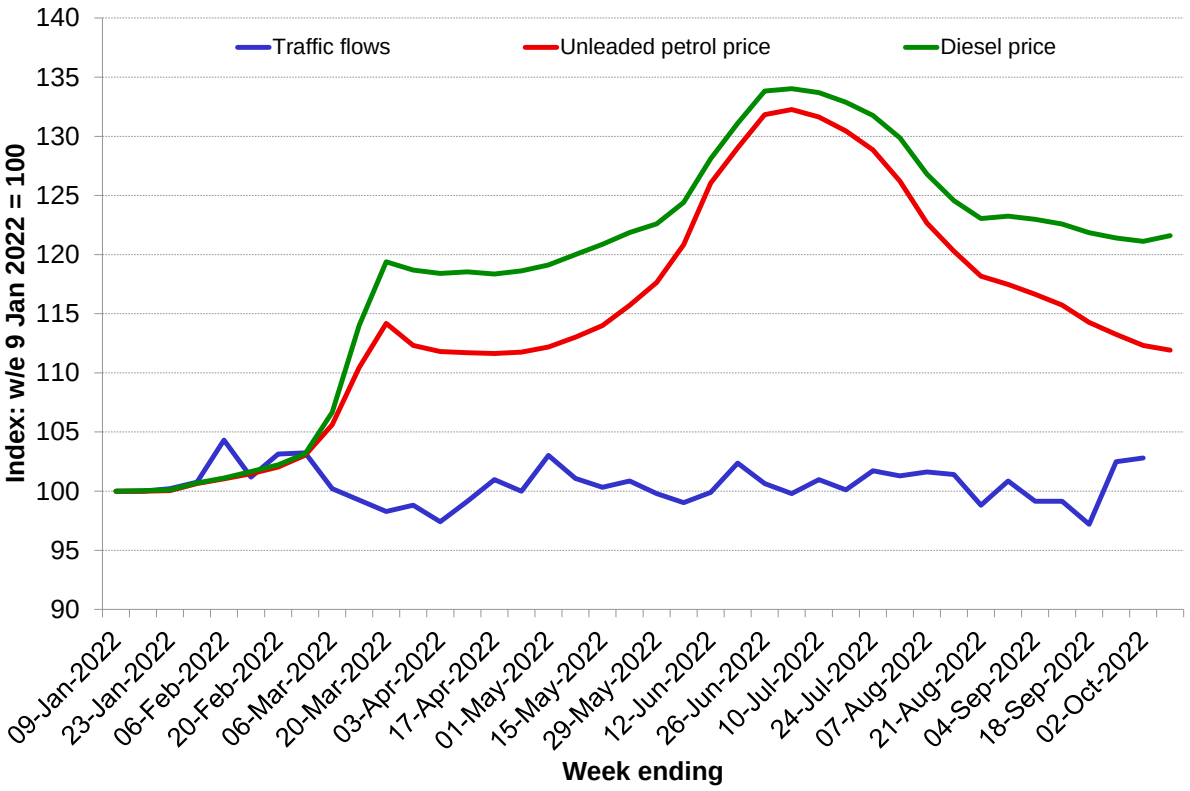
However, following the Russian invasion of Ukraine at the end of February, fuel prices have increased more rapidly, and reached a high of 165.4 pence per litre in mid-March.

Following the reduction in fuel duty by five pence per litre, fuel prices fell temporarily, but started increasing again in May. Fuel prices then peaked at the start of July, reaching almost £2 per litre, but have gradually decreased since then. Despite this, unleaded prices remain 12 per cent higher than in January, with diesel prices 22 per cent higher.

Impact of fuel price changes on traffic volumes in London

The increase in fuel prices appears to have had little effect on overall traffic flows in London, which were increasing until the end of February as a response to the easing of the pandemic restrictions (figure 6.6).

Figure 6.6 Change in fuel prices and traffic flows in London, Jan-Oct 2022.



Source: TfL traffic data.

Flows started to fall slightly during March but have since stabilised and by the start of October were higher than in January.

This suggests that changes in fuel prices have fairly little direct impact on traffic flows in London, perhaps reflecting the shorter distances driven.

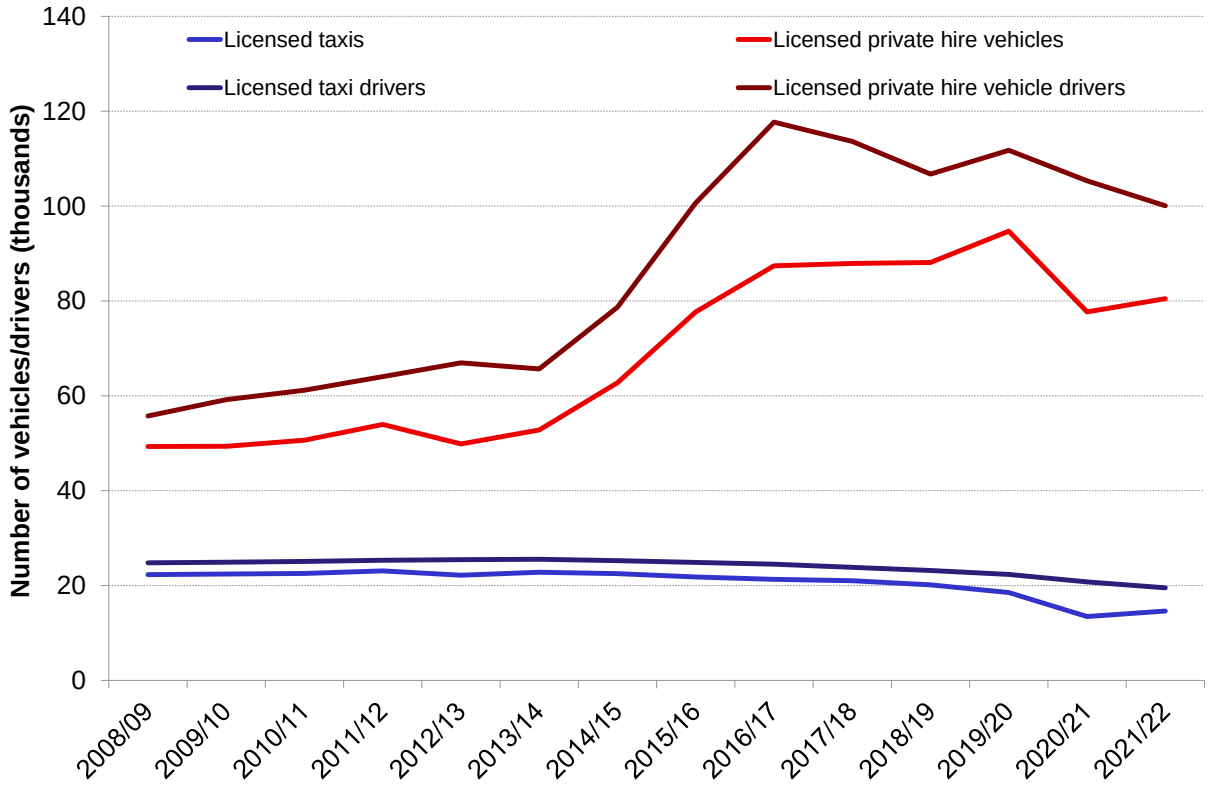
However, the background upwards trajectory that might have been expected as London recovered from the pandemic, and the large number of other disruptive events affecting the transport networks over this period are confounding factors in any attempt to establish a relationship.

6.6 Trends in licensed taxi and private hire vehicles and licences

Licensed taxis

Figure 6.7 shows the trend in the number of licensed taxis and private hire vehicles (PHVs) in London, along with their drivers, since 2008/09.

Figure 6.7 Licensed taxis, private hire vehicles and drivers, 2008/09-2021/22.



Source: TfL traffic data.

The number of licensed taxis in London has shown a gradual decline in recent years, decreasing by a further eight per cent in 2019/20 to 18,504. This declined even further in 2020/21 due to the effects of the pandemic, decreasing by 27 per cent to 13,461.

There was an increase in 2021/22, up by nine per cent to 14,625, but still well below pre-pandemic levels. The total number of licensed taxi drivers continued to decline by a further six per cent to 19,511 in 2021/22, 24 per cent below the high point in 2013/14.

Licensed private hire vehicles

The pandemic has also impacted the number of licensed PHVs in London, which had been increasing up to 2019/20.

In 2021/22, the number of private hire drivers declined by a further five per cent (figure 6.7), 15 per cent below the high point in 2016/17.

The number of private hire operators in London has continued to decline. In 2021/22, there were 1,715 operators in London, a decline of 12 per cent on the previous year and a decrease of 46 per cent since 2011/12, indicating consolidation in the industry.

6.7 Focus on: changes to the Congestion Charge scheme in central London

Several changes to London's Congestion Charge scheme have been made in recent years to address the transport challenges arising from the pandemic and to support London's recovery.

In June 2020, temporary changes were made to the Congestion Charge to address the transport challenges arising from the pandemic. The charge increased to £15 a day and the hours of operation were extended to 07:00 to 22:00, seven days a week. The impact of this on travel in the Congestion Charge zone up to October 2021 is summarised in Travel in London report 14.

This section focuses on changes to the scheme from December 2021 onwards.

Latest changes to the scheme

Following a public consultation between July and October 2021, a number of changes were made to the Congestion Charge scheme to support the long-term objectives of the Mayor's Transport Strategy. These changes were delivered in two phases.

Phase one, implemented on 20 December 2021, comprised:

- No charge between Christmas Day and New Year's Day (inclusive).
- Reopening of the 90 per cent residents' discount to all eligible residents (having been closed to new applicants during the pandemic).
- Charge level remaining at £15.
- No Auto Pay and Fleet Auto Pay discount.

Phase two, implemented on 21 February 2022, comprised the following change:

- Reducing the hours of operation from the temporary hours of 07:00 to 22:00 each day to between 07:00 and 18:00 Monday to Friday and between 12:00 and 18:00 at weekends and on bank holidays.

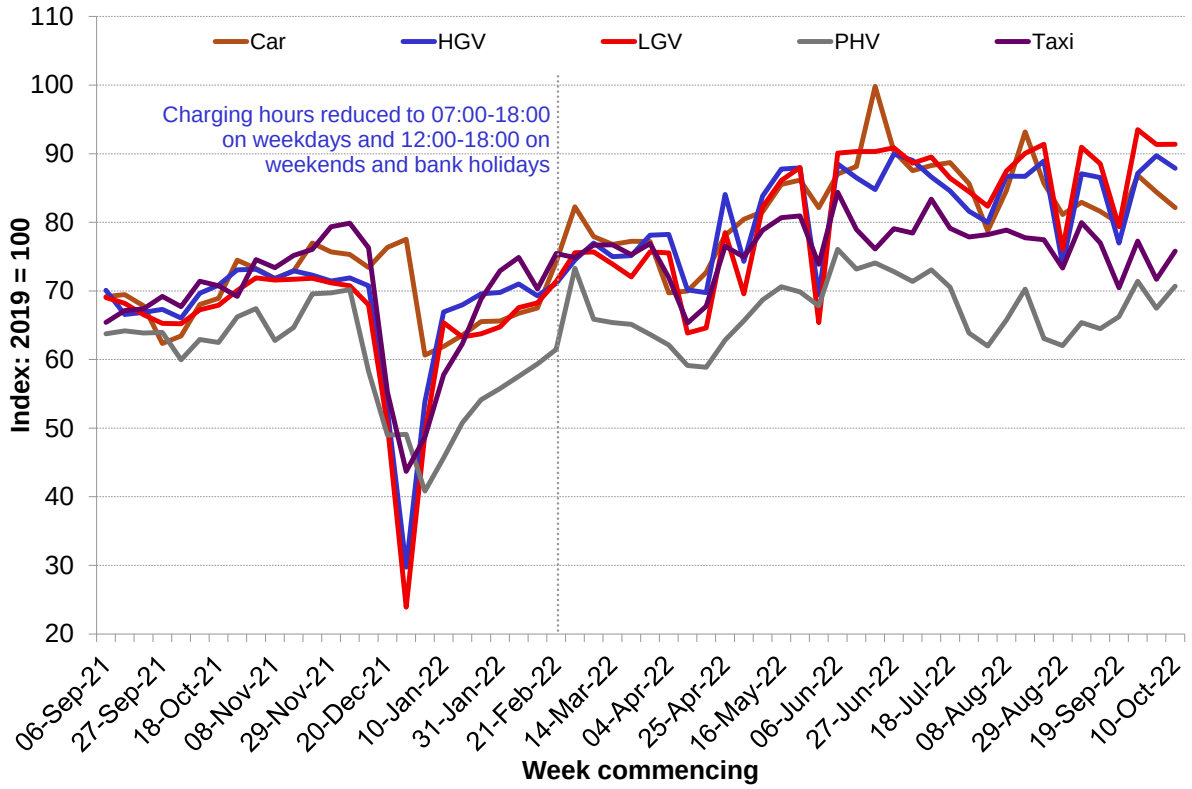
It is important to note, however, that changes to the Congestion Charge were implemented alongside changing travel demand as people returned to the transport network following the Omicron variant wave of the coronavirus pandemic as well as some return of international travel. More information about the recovery from the pandemic and the impact of this on travel demand is given in chapter 2 of this report.

Modal traffic trends in the Congestion Charge zone

At the start of September 2021 average weekly vehicle entries to the Congestion Charge zone ranged between 60 and 70 per cent of 2019 levels for all vehicle types (figure 6.8). Entries for cars and freight vehicles were around 70 per cent of the pre-pandemic levels, with entries for licensed taxis and PHVs slightly lower at 65 per cent and 64 per cent respectively.

There was an increase in entries for all vehicle types towards early December 2021, followed by a fall over the Christmas period for freight vehicles, taxis and PHVs. Entries for all vehicle types remained lower in early 2022, compared to autumn 2021, likely as a result of the Omicron variant wave.

Figure 6.8 Change in weekly entries (camera captures) to the Congestion Charge zone by mode, Sep 2021-Oct 2022 vs 2019.



Source: TfL traffic data.

In the week that the Congestion Charge hours of operation were reduced to 07:00 to 18:00 on weekdays and 12:00 to 18:00 on weekends (week commencing 21 February 2022) car entries increased by 10 per cent compared to the previous week. There was a small increase in freight vehicles, of three per cent and five per cent for HGVs and LGVs respectively.

In the week commencing 28 February 2022 there was a spike in car and PHV entries as a result of industrial action on the London Underground on 1 and 3 March.

Average weekly entries for all vehicle types increased through May, in line with the more general resumption of activity.

However, by September freight vehicle entries remained at a similar level to June, while entries for car, taxis and PHVs declined slightly.

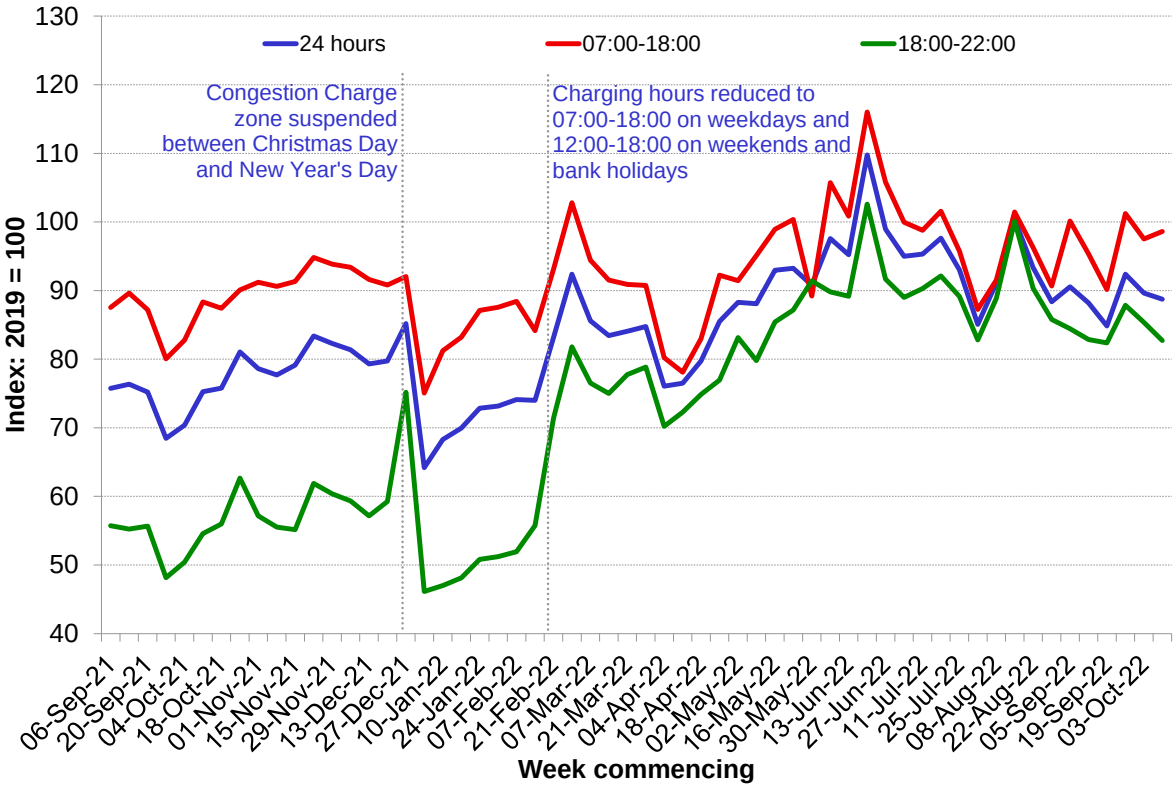
At the start of October 2022, LGV entries had returned to the greatest extent (91 per cent of 2019 levels), followed by HGVs (88 per cent) and cars (82 per cent). Taxis and PHVs have been slower to return. At the start of October taxi entries were 76 per cent of the pre-pandemic levels while PHVs were 71 per cent of the pre-pandemic levels.

Change in weekday traffic flows by time of day

Figure 6.9 shows weekday car entries to the Congestion Charge zone by time of day, compared to a 2019 baseline. It shows all-day car entries (24 hours), entries during current charging hours (07:00 to 18:00) and during the times previously

covered by the charging hours before the changes on 21 February 2022 (18:00 to 22:00).

Figure 6.9 Change in weekday car entries (camera captures) to the Congestion Charge zone by time of day, Sep 2021-Oct 2022 vs 2019.



Source: TfL traffic data.

The suspension of the Congestion Charge between Christmas Day and New Year's Day led to a seven per cent increase in weekday car entries compared to the previous week. The times between 18:00 and 22:00 had the greatest increase, 27 per cent compared to the previous week.

During January and February 2022 weekday car entries to the Congestion Charge zone remained lower than the autumn 2021 levels, likely as a result of the Omicron variant wave.

In the week that the Congestion Charge hours of operation were altered, weekday car entries to the Congestion Charge zone between 18:00 and 22:00 increased by 28 per cent. However, traffic during this time remained well below pre-pandemic levels (71 per cent).

Furthermore, there was also an increase in weekday car entries during the charging hours (07:00 to 18:00), indicating that the increase in weekday car entries during the previous charging hours was not as a result of vehicles travelling at a different time.

There was a further increase in weekday entries to the Congestion Charge zone in the week commencing 28 February 2022, as a result of industrial action on the London Underground on 1 and 3 March.

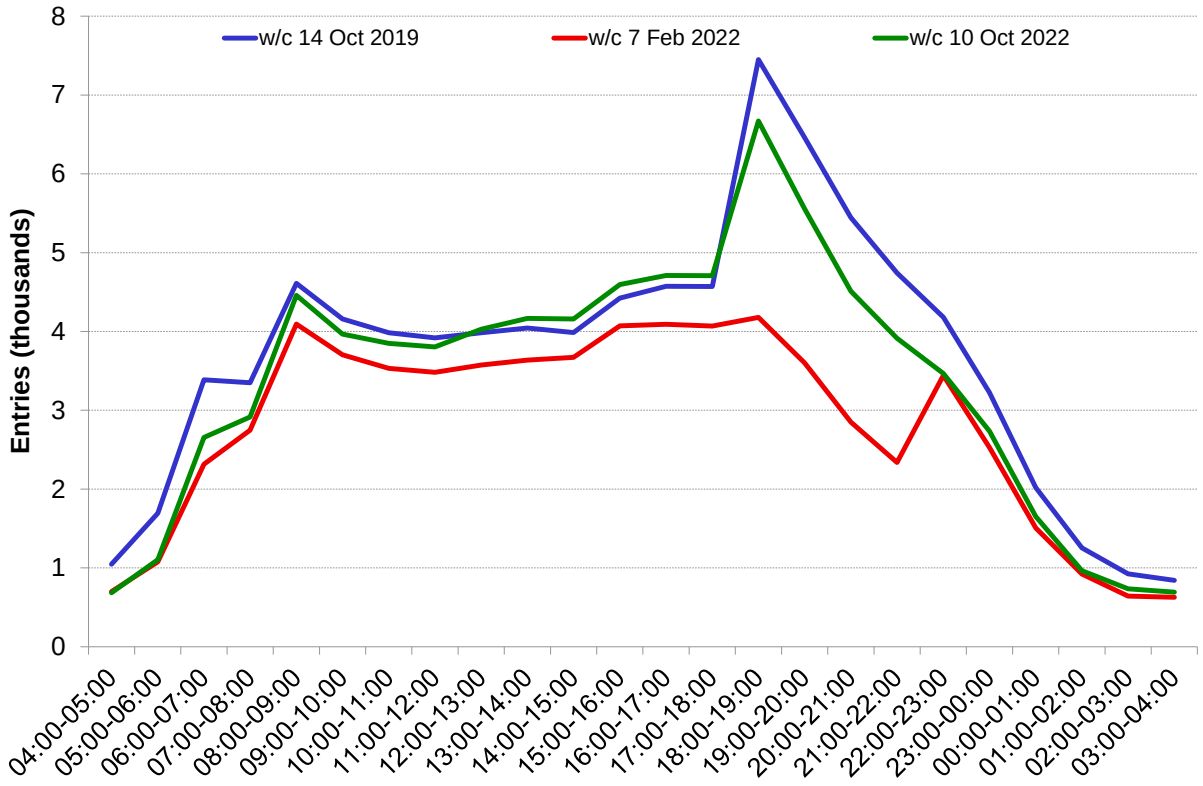
Following a dip over the Easter period, weekday car entries returned strongly, peaking in the week commencing 20 June 2022 due to further industrial action.

Weekday car entries at all times fell towards the summer period and have remained at a similar level since August.

At the start of October 2022, weekday car entries during the current charging hours (07:00 to 18:00) had returned to a greater extent than during other times, reaching 98 per cent of the pre-pandemic levels. Weekday car entries during the time no longer covered by the charge (18:00 to 22:00) were at 85 per cent.

The daily profile for weekday car entries to the charging zone is shown in figure 6.10 for three representative weeks: one before the pandemic, when the charge operated from 07:00 to 18:00 (week commencing 14 October 2019), one when the charge operated 07:00 to 22:00 (week commencing 7 February 2022) and the most recent week, when the charge returned to 07:00 to 18:00 (week commencing 10 October 2022).

Figure 6.10 Average weekday car entries (camera captures) to the Congestion Charge zone by hour, selected weeks in 2019 and 2022.



Source: TfL traffic data.

The graph shows that in February 2022 weekday car entries between 08:00 and 18:00 had returned to around 90 per cent of pre-pandemic levels, and by October 2022 entries during the same time had largely returned to pre-pandemic levels.

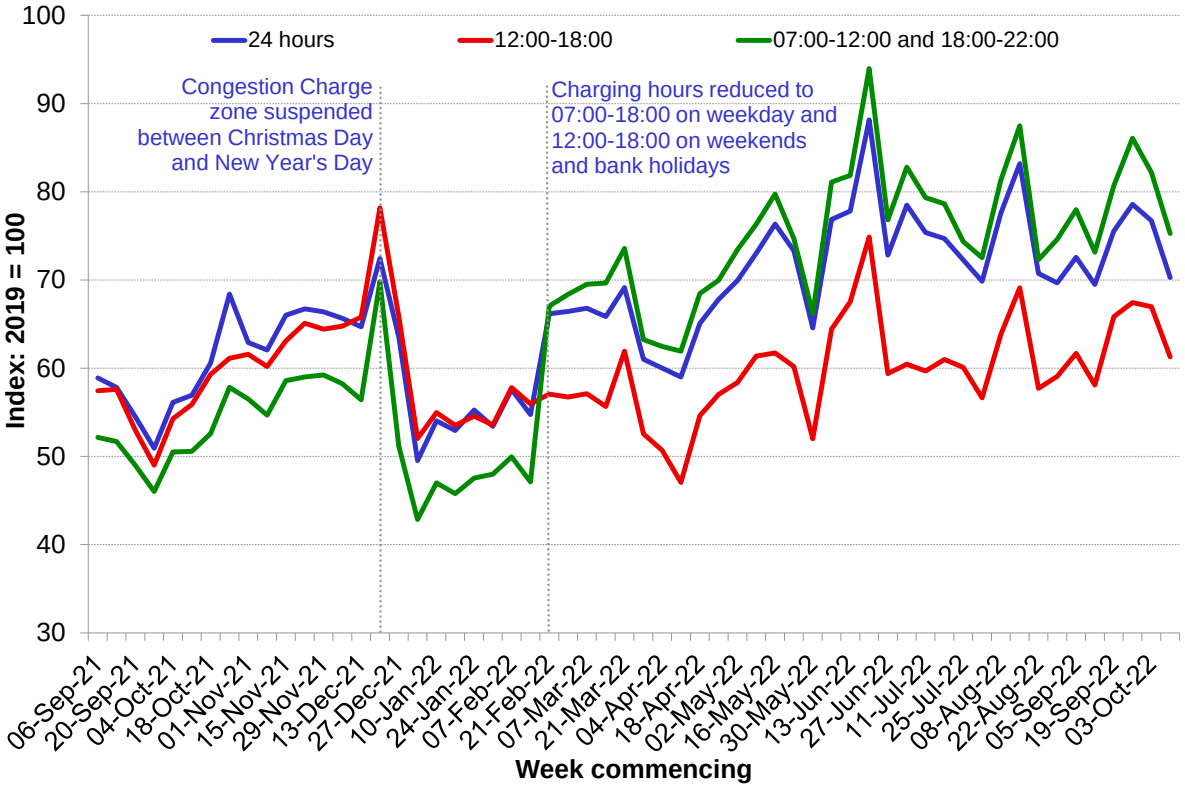
The impact of extending the charge from 18:00 to 22:00 is also apparent, with February 2022 data showing around 50 per cent fewer car entries during this time compared to before the pandemic. However, this is also likely to be impacted by subdued travel due to the Omicron variant wave.

By mid-October 2022, when the charge no longer operated between 18:00 and 22:00, weekday car entries between 18:00 and 19:00 had returned to 90 per cent of pre-pandemic levels.

Change in weekend traffic flows by time of day

Figure 6.11 shows the return of weekend car entries to the charging zone by time of day, compared to a 2019 baseline. It shows all-day car entries (24 hours), entries during current charging hours (12:00 to 18:00) and for the times previously covered by the charging hours prior to the changes on 21 February 2022 (07:00 to 12:00 and 18:00 to 22:00).

Figure 6.11 Change in weekend car entries (camera captures) to the Congestion Charge zone by time of day, Sep 2021-Oct 2022 vs 2019.



Source: TfL traffic data.

In September 2021, weekend car entries to the charging zone were between 50 and 60 per cent of the pre-pandemic levels. Weekend car entries rose toward the end of 2021, peaking in late December as the charge was suspended between Christmas Day and New Year's Day. Entries remained low in January and early February, likely as a result of the Omicron variant wave.

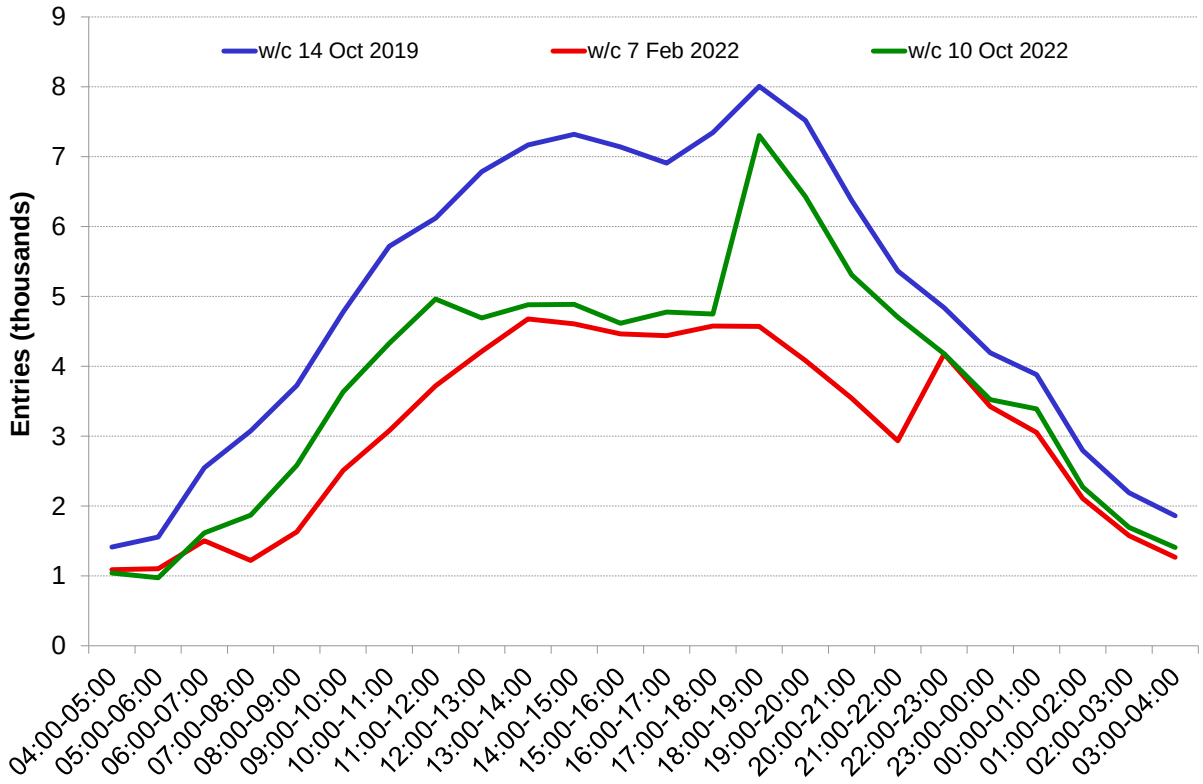
The shortening of the Congestion Charge hours of operation in the week commencing 21 February 2022 led to a large increase in weekend car entries. Average weekend car entries increased by 21 per cent, and entries during the times that were temporarily charged during the pandemic increased by 42 per cent. Nonetheless, average daily car entries remained well below the pre-pandemic levels, at 66 per cent.

Weekend car entries across all times increased to a peak in the week commencing 20 June 2022. However, traffic has been slower to return during current charging hours, likely as a result of a charge not applying on weekends prior to the pandemic.

In October 2022 weekend car entries at all times remained well below the pre-pandemic levels. Average weekend car entries were 70 per cent of the pre-pandemic levels and entries during the charging hours were at 61 per cent.

The daily profile for weekend car entries to the charging zone is shown in figure 6.12 for three representative weeks: one before the pandemic when the charge did not apply on weekends (week commencing 14 October 2019), one when the charge applied 07:00 to 22:00 (week commencing 7 February 2022) and the most recent, when the charge applied 12:00 to 18:00 (week commencing 10 October 2022).

Figure 6.12 Average weekend car entries (camera captures) to the Congestion Charge zone by hour, selected weeks in 2019 and 2022.



Source: TfL traffic data.

The graph shows that prior to the pandemic weekend car entries rose steadily through the day, peaking between 18:00 and 19:00.

Data for February 2022, when the charge operated 07:00 to 22:00, shows that car entries rose steadily until 14:00, then remained flat until 19:00. There was a dip in entries between 19:00 and 22:00, followed by a slight increase in the hour after the charging period ends.

Average weekend car entries for week commencing 10 October 2022 show how weekend traffic has changed as a result of the shortening of the Congestion Charge hours of operation and a return of travel demand following the pandemic.

Outside of the current charging hours (12:00 to 18:00) weekend car entries follow a similar pattern to pre-pandemic entries.

However, the impact of the charge is evident with weekend car entries 67 per cent lower than the pre-pandemic levels between 12:00 and 18:00, compared to 81 per cent outside of these hours.

Conclusion

It is clear that the changes to the Congestion Charge hours of operation have influenced the return of motorised traffic in central London.

It is however important to consider road traffic trends in central London over the last year in the wider context of the pandemic recovery as well as several days affected by industrial action on rail during the period of analysis. The data shows that:

- The return of traffic to central London varies by vehicle type. In October 2022, freight vehicles had returned to the greatest extent with LGVs and HGVs returning to 91 per cent and 88 per cent of 2019 levels respectively. PHVs and taxis had returned to a lower level, at 71 per cent and 76 per cent of the pre-pandemic levels.
- In October 2022, weekday car entries had returned to 89 per cent of 2019 demand, and entries during current charging hours (07:00 to 18:00) were broadly similar to pre-pandemic levels.
- Despite weekday car entries between 18:00 and 22:00 increasing by 28 per cent in the week the charging hours were reduced, car entries during this time remained at 71 per cent of the pre-pandemic levels.
- Car entries to the charging zone on weekends remain well below the pre-pandemic levels. This is likely due to the charge currently operating between 12:00 and 18:00, when a charge did not operate prior to the pandemic. Car entries during this time are 61 per cent of 2019 levels, compared to 70 per cent across the day.
- Weekend car entries to the charging zone increased by 21 per cent on the weekend that the charging hours were shortened, and by 42 per cent in the periods that were temporarily charged during the pandemic (07:00 to 12:00 and 18:00 to 22:00). However, car entries on weekends during this time remained well below the pre-pandemic levels and weekend car entries in October 2022 were around 70 per cent of the pre-pandemic levels.

Changes to traffic as a result of changes to the scheme are broadly in line with expectation, when also accounting for pandemic-related travel demand changes in central London.

6.8 Congestion and delay

Trends in average vehicle speed and delay on London’s roads were described in Travel in London report 14, covering the period up to the end of 2020.

During 2021, the DfT (originator of this data) changed its supplier. This resulted in a significant discontinuity to the long-term time series such that absolute values for 2021 are not readily comparable with earlier data and trends (see also the Impact of Changing Local 'A' Roads Data Source website). Data is also not yet available for 2022.

TfL is currently working to understand these revised measurements.

6.9 TfL’s e-scooter trial

There is increasing interest in innovative and shared forms of transport and the extent to which they may be able to contribute to the Mayor’s transport aims. This includes micromobility (typically hire-based or lightweight forms of transport, such as scooters or cycles) and other forms of shared transport, notably car clubs. TfL is investigating the potential of these forms of transport and the following section gives an update on some aspects of this work.

London’s e-scooter trial

London's e-scooter trial launched in June 2021 as part of a national trial authorised by the DfT and has expanded significantly since, with 10 boroughs, more than 500 designated parking locations and 4,425 e-scooters now involved. Up to October 2022, 1.9 million journeys were made across the three operators taking part in London's trial (Dott, Lime and TIER). Table 6.3 shows headline statistics from the trial over the trial period.

Table 6.3 London e-scooter rental trial headline metrics.

Trial period	Permitted fleet size	Total trips (thousands)	Average trip distance (km)	Average trip duration (min)	Serious injuries reported
7 Jun-4 Jul 2021	600	35	2.9	24	1
5 Jul-1 Aug 2021	1,200	50	2.7	22	2
2 Aug-29 Aug 2021	2,700	80	2.8	21	2
30 Aug-26 Sep 2021	2,835	95	2.8	22	1
27 Sep-24 Oct 2021	3,480	100	2.5	18	3
25 Oct-21 Nov 2021	3,585	90	2.5	18	0
22 Nov-19 Dec 2021	3,585	70	2.4	17	4
20 Dec-2021-16 Jan 2022	3,585	60	2.5	18	1
17 Jan-13 Feb 2022	3,585	75	2.4	16	1
14 Feb-13 Mar 2022	3,585	80	2.4	16	0
14 Mar-10 Apr 2022	4,010	95	2.5	16	1
11 Apr-8 May 2022	4,010	130	2.6	17	0
9 May-5 Jun 2022	4,100	145	2.6	17	2
6 Jun-3 Jul 2022	4,125	180	2.8	18	2
4 Jul-31 Jul 2022	4,125	180	2.7	17	1
1 Aug-28 Aug 2022	4,365	170	2.7	17	0
29 Aug-25 Sep 2022	4,425	140	2.5	16	1
26 Sep-23 Oct 2022	4,425	125	2.4	15	0
Total/average		**1,900**	**2.6**	**18**	**22**

Source: TfL e-scooter rental trial.
Note: Trip numbers exclude trips with a distance less than 50 metres or with a duration of zero minutes and are rounded to the nearest 5,000 at period level, therefore the rounded total may differ from the sum of the rounded period subtotals. The number of participating boroughs changed over time: Ealing, Hammersmith & Fulham, Kensington & Chelsea, Richmond upon Thames and Tower Hamlets participated from the beginning; City of London, Lambeth and Southwark joined in the second trial period, Westminster on the third trial period and Camden in the fifth period.

The following are some notable features emerging from the data:

- Demand is seasonal: it peaks in the summer and drops in the winter.
- Equally, travel behaviour changes with the seasons: longer trips (distance/duration) in summer, shorter in winter.
- Despite increasing trip numbers, the number of serious injuries has been falling over time, as the trial matures.
- New boroughs joining the trial has led to increased capacity and allowed larger fleet sizes, contributing to higher trip numbers.

6.10 TfL's position on car clubs

Car clubs for residents, when paired with a reduction in the availability of private parking, can allow more Londoners to forgo car ownership while allowing for infrequent car travel in inner and outer London, thus potentially contributing towards the Mayor's active, efficient and sustainable mode share aims. The car club fleet size in London was 3,582 vehicles in 2021.

Policies on residential parking are set out in the London Plan, which also states that car clubs count towards the maximum parking permitted because they share many of the impacts of privately owned cars. However, in some areas, car club spaces can help support lower parking provision and 'car-lite' lifestyles by allowing multiple households to make infrequent trips by car.

TfL has conducted a review of its policy on car clubs to set out how it can work with car clubs to take the Mayor's aims forward and help deliver the benefits of reduced car ownership.

The result of this review is a set of commitments that TfL, working closely with London Councils, the boroughs, car club operators and the wider sector will take forward. In summary, these commitments are:

- To work with London Councils, the boroughs and the industry to encourage data sharing and visualisation to help inform strategic planning and policy development.
- To ensure that car clubs are included in policies and public messages that reference alternatives to car ownership, particularly when targeted at areas with high car ownership.
- To support operators and provide opportunities to promote third-party offers as part of scrappage schemes to people who want to reduce their private car use.
- To consider the role of car clubs in any potential future form of integrated road charging schemes.
- To support the electrification of car clubs through the rollout of electric vehicle charging in London and to work with the operators to assess the needs of car clubs when implementing charging on TfL/Greater London Authority land.
- To provide quarterly updates setting out progress with these commitments.

The latest trends relating to car clubs in London are summarised in CoMoUK's London Car Club Report 2021.

6.11 The potential for cargo bikes in London

The use of cargo bikes in London has been increasing in recent years, although cargo bikes still represent less than one per cent of all cycle flows in London.

However, given their potential to operate more efficiently and sustainably than vans or cars in certain contexts, TfL is keen to explore how they can support the Mayor’s aims and contribute to reduce congestion and improve air quality.

Cargo bikes can come in many shapes and sizes. While some of them may look much like conventional two-wheel cycles with a trailer on the back or a rack on the front, others may look almost like a small van, with four wheels, electric assistance for pedalling and a roof (see figure 6.13).

Cargo bikes can also serve a variety of purposes and users. Some can be used to transport goods, others to move passengers (for example children), and either can be used both commercially (for example to deliver goods or services) or for personal travel (such as shopping, escort or leisure).

While TfL is interested in the growing use of both commercial and private cargo bikes, it is the former (so called cycle freight) that has been identified as having the higher potential for mode shift, particularly from vans, and therefore the higher potential to reduce congestion and improve air quality in London.

Figure 6.13 Examples of cargo bikes.

Source: TfL Image Library.

The potential for cycle freight in London

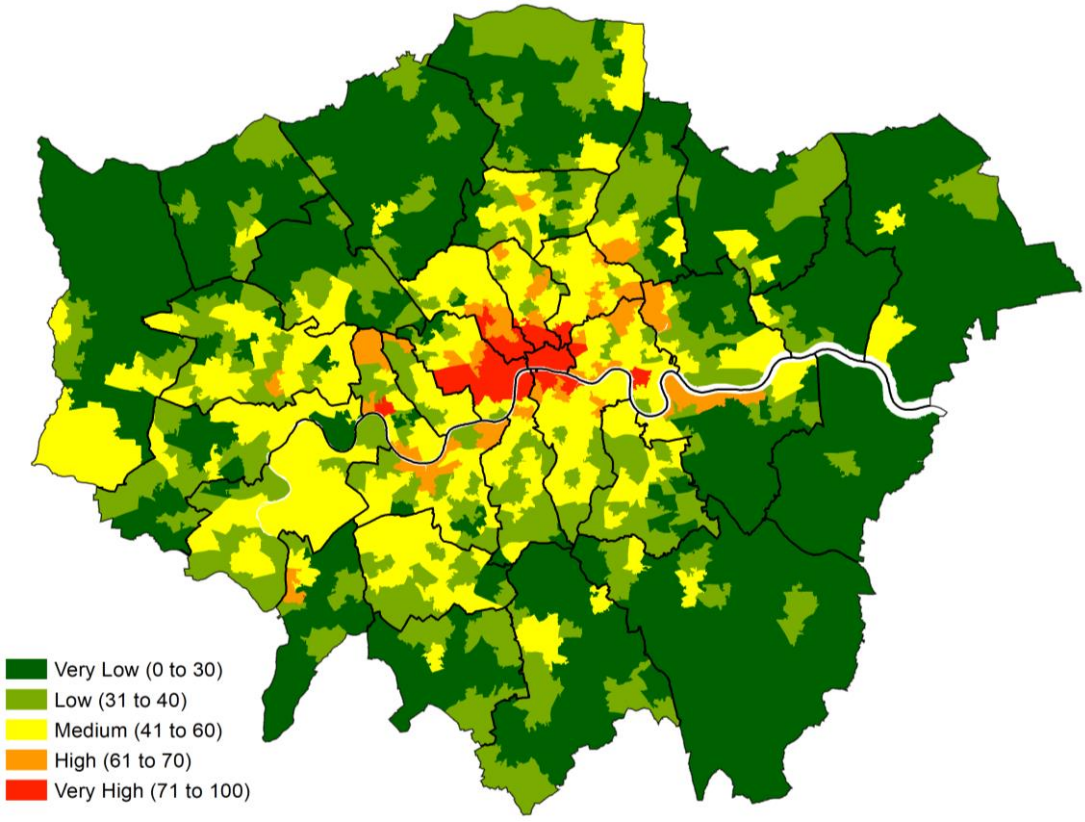
In 2018 TfL commissioned Element Energy to conduct independent research on the capability and viability of cargo bikes specifically used for freight and servicing. This Cycle Freight Study set out the challenges and opportunities associated with substituting motorised vehicles with cycle freight and a methodology to assess cycle freight potential at a local level.

In early 2023, TfL is set to publish a cycle freight strategy which aims to promote and enable the use of cargo bikes by ensuring that they are an attractive, safe, clean, efficient, and viable alternative to vans, specifically for last-mile freight and servicing.

To support this strategy there was a need to understand the potential of cycle freight across London, so that specific areas could be targeted for prioritisation. To do this, TfL adapted the methodology set out in the Cycle Freight Study and used a range of datasets and geospatial techniques to estimate the potential for cycle freight at a Middle layer Super Output Area level, using existing case studies to calibrate and validate the results.

For each output area, a score representing cycle freight potential was calculated using a set of seven factors identified through stakeholder engagement, which included: employment and retail density, microconsolidation potential, comparative cycling and vehicle permeability, cycling infrastructure and mode share, congestion, supportive boroughs and policies, and presence of Business Improvement Districts and suitable businesses. The results of this exercise are shown by figure 6.14.

Figure 6.14 Potential for cycle freight in London.



Source: TfL City Planning.

It is clear that, in general, central London has the highest potential for cycle freight, which is not surprising given that it scores high against all factors, particularly office and retail density, cycling permeability, congestion, and supportive measures.

However, most of inner London also scores medium to high, with Hammersmith town centre and Canary Wharf scoring highest in this area. Even parts of outer London, such as Kingston town centre and Ealing, score relatively well due to high scores for cycle permeability, presence of suitable businesses and cycling levels.

Estimated growth of cycle freight in London

To calculate the potential benefits of the strategy and identify areas where there might be operational or capacity constraints, there was a need to understand the likely growth in cycle freight in terms of cargo bike kilometres displacing van kilometres. This was done adapting the existing methodology from the Cycle Freight Study and using various DfT estimates and the latest TfL forecasts.

The results suggest that, depending on the measures put in place, by 2025 up to two per cent of van kilometres across London could be replaced by cargo bikes. The uptake, however, would vary across London, with central London seeing between three and nine per cent of van kilometres displaced and some areas potentially seeing even higher uptakes.

Section 3: A good public transport experience

7. Trends in public transport demand, service provision and operational performance

7.1 Introduction

The Mayor's Transport Strategy aims to provide a good public transport experience in London; one that is efficient, affordable and attractive for journeys that cannot be made by walking or cycling.

Building on the aggregate public transport demand and mode share trends described in chapter 2, this chapter considers individual modes in more detail.

- The first part of the chapter considers travel demand trends on the various public transport networks up to the end of financial year 2021/22 and into mid-2022, where data is available, showing the current position in the recovery from the coronavirus pandemic in the context of longer-term trends.
- The second part looks at trends in service provision (particularly capacity) and provides a review of selected indicators of operational performance for each of the main modes over a similar timescale.

Other aspects of the customer experience on public transport such as accessibility and safety are discussed in chapter 8. The early impacts of the new Elizabeth line are addressed in detail in chapter 9, while other recent major public transport projects such as the London Overground extension to Barking Riverside and the Northern Line Extension feature in chapter 10 of this report.

7.2 Demand on public transport: pandemic recovery in the longer-term context

Previous Travel in London reports described the strong growth in public transport demand over the last two decades and the slowdown since the mid-2010s following changes to factors such as population, economic growth and disposable incomes.

Furthermore, Travel in London reports 13 and 14 detailed the short-term impacts of the coronavirus pandemic on public transport demand.

With the last restrictions to economic activity and travel in England lifted by July 2021, the second half of 2021 and most of 2022 (save for a small hiatus with the Omicron variant in winter 2021/22) can be described as a period of consolidation and early recovery.

Given the relatively short period of elapsed time and the disruptive effect of various non-pandemic events affecting travel demand during 2022 (for example industrial action affecting the rail networks), it is still too early to discern a settled position for post-pandemic demand. And while the impacts of the pandemic are clearly persisting in some areas, the general upwards trajectory throughout 2022 is encouraging.

This section therefore focuses on the latest available evidence of the public transport demand recovery in the context of recent pre-pandemic trends.

Tables 7.1 (journeys) and 7.2 (passenger kilometres) show annual public transport patronage across all TfL-operated modes over the last decade.

Table 7.1 Demand (million journeys) on TfL's modes, 2011/11-2021/22.

Year	Buses	LU	DLR	LO	TfL Rail[1]	Trams	Total[2]	River Services	IFS Cloud Cable Car
2011/12	2,320	1,171	86	103	-	29	**3,708**	6.6	-
2012/13	2,311	1,229	100	125	-	30	**3,795**	6.3	2.0
2013/14	2,382	1,265	102	136	-	31	**3,916**	8.4	1.5
2014/15	2,385	1,305	110	140	-	31	**3,972**	10.0	1.5
2015/16	2,314	1,349	117	183	37	27	**4,028**	10.2	1.5
2016/17	2,262	1,378	122	189	45	30	**4,025**	10.4	1.5
2017/18	2,247	1,357	120	190	42	29	**3,985**	10.0	1.4
2018/19	2,220	1,385	122	188	51	29	**3,995**	9.8	1.4
2019/20	2,112	1,337	117	186	56	27	**3,835**	9.6	1.2
2020/21	865	296	40	59	18	12	**1,290**	1.6	0.4
2021/22	1,491	748	77	127	37	19	**2,499**	5.3	1.4
Change in 2021/22 from 2019/20 (best pre-pandemic baseline)									
	-29%	*-44%*	*-34%*	*-32%*	*-33%*	*-30%*	*-35%*	*-45%*	*15%*

Source: TfL service performance data.
1: The Elizabeth line opened in May 2022 and as such the results up to 2021/22 refer only to the previous TfL Rail services.
2: This total is calculated for the main modes only for easier comparison of the overall change with table 7.2 below, given that passenger kilometres values are only available for a subset of modes.

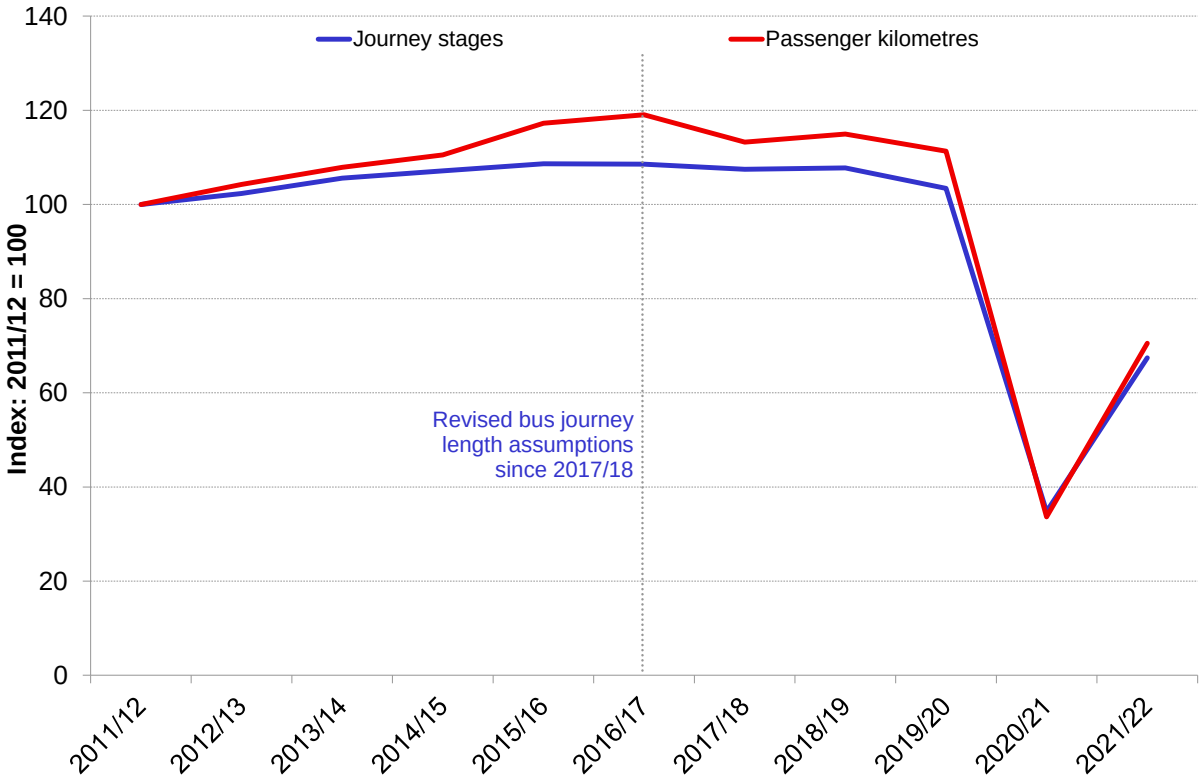
Table 7.2 Demand (million passenger kilometres) on the main public transport modes, 2011/12-2021/22.

Year	Buses	LU	DLR	LO	TfL Rail[1]	Trams	Total
2011/12	8,121	9,519	455	645	-	150	**18,890**
2012/13	8,148	10,099	510	780	-	156	**19,694**
2013/14	8,420	10,423	537	840	-	162	**20,383**
2014/15	8,418	10,847	590	863	-	160	**20,878**
2015/16	8,188	11,458	623	1,237	505	140	**22,150**
2016/17	8,016	11,797	657	1,294	569	154	**22,487**
2017/18	6,899[2]	11,869	644	1,296	534	151	**21,393**
2018/19	6,836	12,150	654	1,288	643	149	**21,719**
2019/20	6,538	11,746	621	1,273	706	141[3]	**21,025**
2020/21	2,754	2,707	207	402	222	60	**6,352**
2021/22	4,774	6,726	398	864	460	98	**13,319**
Change in 2021/22 from 2019/20 (best pre-pandemic baseline)							
	-27%	*-43%*	*-36%*	*-32%*	*-35%*	*-30%*	*-37%*

Source: TfL service performance data.
1: See note 1 on table 7.1.
2: Methodological changes created a break in the time series for passenger kilometres after 2017/18.
3: Trams passenger kilometres estimates rely on assumptions about average trip length derived from a survey that has not been repeated since 2018/19 so the values after that are using the latest available average trip length.

Figure 7.1 illustrates the change in total journeys and passenger kilometres on TfL-operated public transport modes as an index.

Figure 7.1 Patronage on the main TfL public transport modes (excluding IFS Cloud Cable Car and London River Services), 2011/12-2021/22.



Source: TfL service performance data.
Note: This graph does not include National Rail in London, which is not a TfL-operated mode.

The overall picture is of slow growth in demand in the early 2010s up to a high point around the middle of the decade and a slight decrease between then and the outbreak of the coronavirus pandemic in early 2020.

The pandemic triggered a large drop in demand that reached a low point in 2020/21, from which it bounced back to some 65 per cent of the pre-pandemic number of journeys in 2021/22.

By early October 2022, recovery across all TfL-operated public transport modes was at 85 per cent (see also figure 2.1 in chapter 2). Looking at each mode in detail:

- On **buses**, for the 2021/22 financial year the number of journeys had recovered to about 70 per cent of the pre-pandemic baseline but remained 38 per cent lower than the high point in 2014/15. By early October 2022, journeys were some 84 per cent of the pre-pandemic baseline.
- On **London Underground**, both journeys and passenger kilometres in 2021/22 were about 56 per cent of the pre-pandemic baseline and some 46 per cent below their high point in 2018/19. In early October 2022, journeys were 82 per cent of the pre-pandemic level.
- By 2021/22, the **other TfL rail** networks (DLR, London Overground, TfL Rail and London Trams), albeit with minor differences among them, generally showed a slightly higher recovery than London Underground, with London Trams having recovered fastest and standing at 70 per cent, followed closely by London

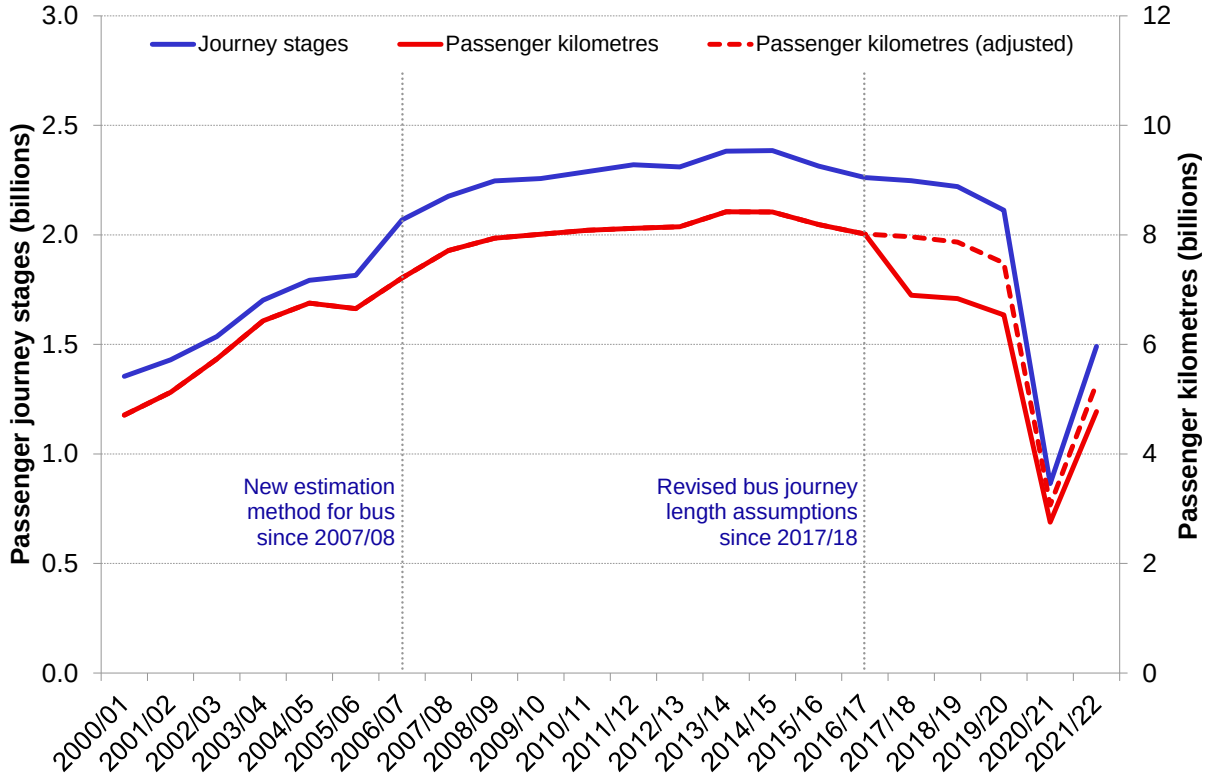
Overground at 68 per cent, TfL Rail at 67 per cent and finally DLR at 66 per cent. As of early October 2022, London Trams journeys had recovered to 76 per cent, London Overground to 78 per cent and DLR to 80 per cent.

- Finally, demand on **London River Services** recovered to 55 per cent of the pre-pandemic baseline by 2021/22, while the **IFS Cloud Cable Car** saw a full recovery and even reached higher demand levels last seen in 2017/18.

Buses: demand recovery position in the longer-term context

Figure 7.2 looks more closely at demand trends on buses, which are the most used public transport mode in London.

Figure 7.2 Passenger kilometres and journey stages by bus, 2000/01-2021/22.



Source: TfL service performance data.
Note: Methodological changes created a break in the time series for passenger kilometres after 2017/18. To allow like-for-like comparisons across this break, an adjusted series (dashed) has been added which uses the old assumptions.

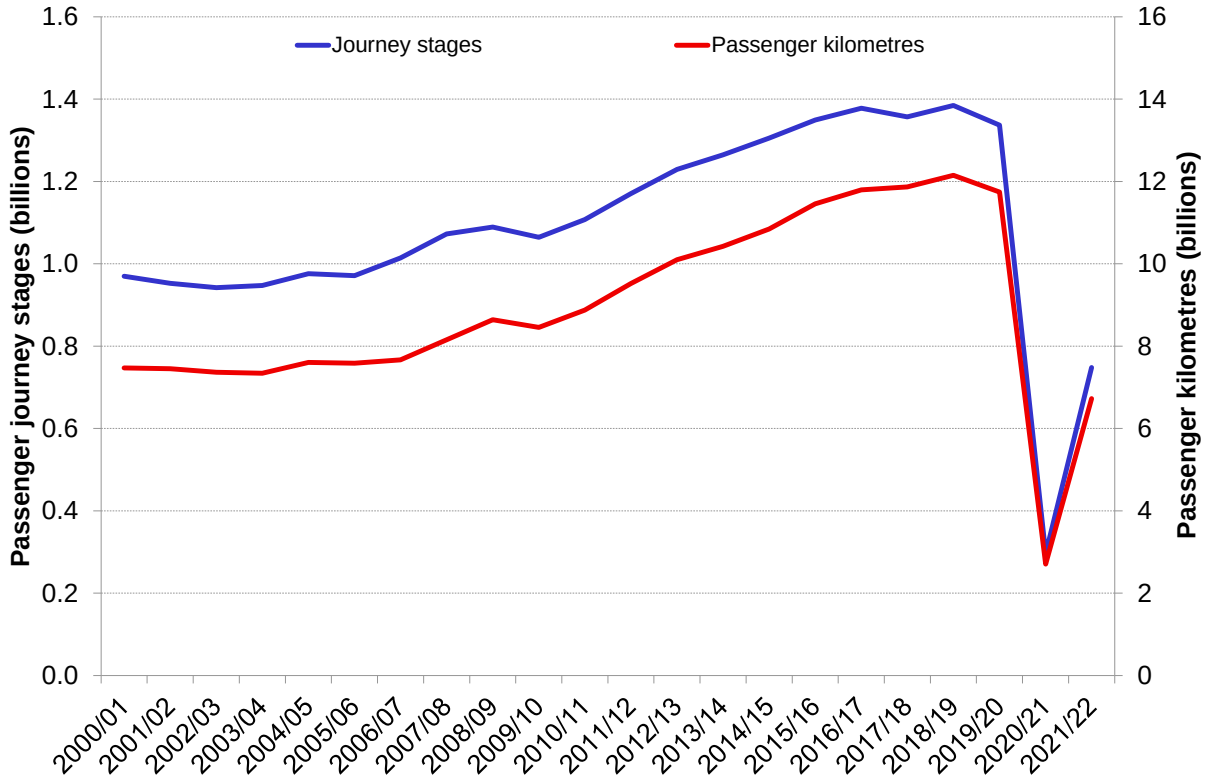
The main features are:

- The long-term trend over the last two decades was of sustained growth in demand (very strong in the first decade of the millennium and slower afterwards) up to a high point in the mid-2010s, followed by a slow decline.
- When the coronavirus pandemic hit, demand dropped to a historic minimum and progressively recovered in a trajectory interrupted several times by changes to travel restrictions throughout most of 2020 and 2021.
- For the 2021/22 financial year, annual demand had recovered to some 71 per cent of pre-pandemic journeys and 73 per cent in terms of passenger kilometres.
- By autumn 2022, bus demand had recovered to some 84 per cent of the pre-pandemic baseline, after having been at some 80 per cent since early summer 2022 (see figure 2.1 in chapter 2).

London Underground: demand recovery position in the longer-term context

Figure 7.3 gives an overview of London Underground demand trends.

Figure 7.3 Passenger kilometres and journey stages by London Underground, 2000/01-2021/22.



Source: TfL service performance data.

The main features are:

- Steady growth over the last two decades (slower in the first decade of the millennium and faster afterwards, reflecting network upgrades) up to a high point immediately before the pandemic.
- During the pandemic, demand dropped to the lowest level on record in 2020 and progressively recovered in stages following changes to the economic activity and travel restrictions throughout 2020 and 2021, albeit at a slower pace than other modes, notably buses.
- In the 2021/22 financial year, annual demand had recovered to some 56 per cent of the pre-pandemic level for journeys and 57 per cent in terms of passenger kilometres.
- By autumn 2022, London Underground aggregate demand was at around 82 per cent of the pre-pandemic level, having largely closed the gap in recovery with buses (see also figure 2.1 in chapter 2).

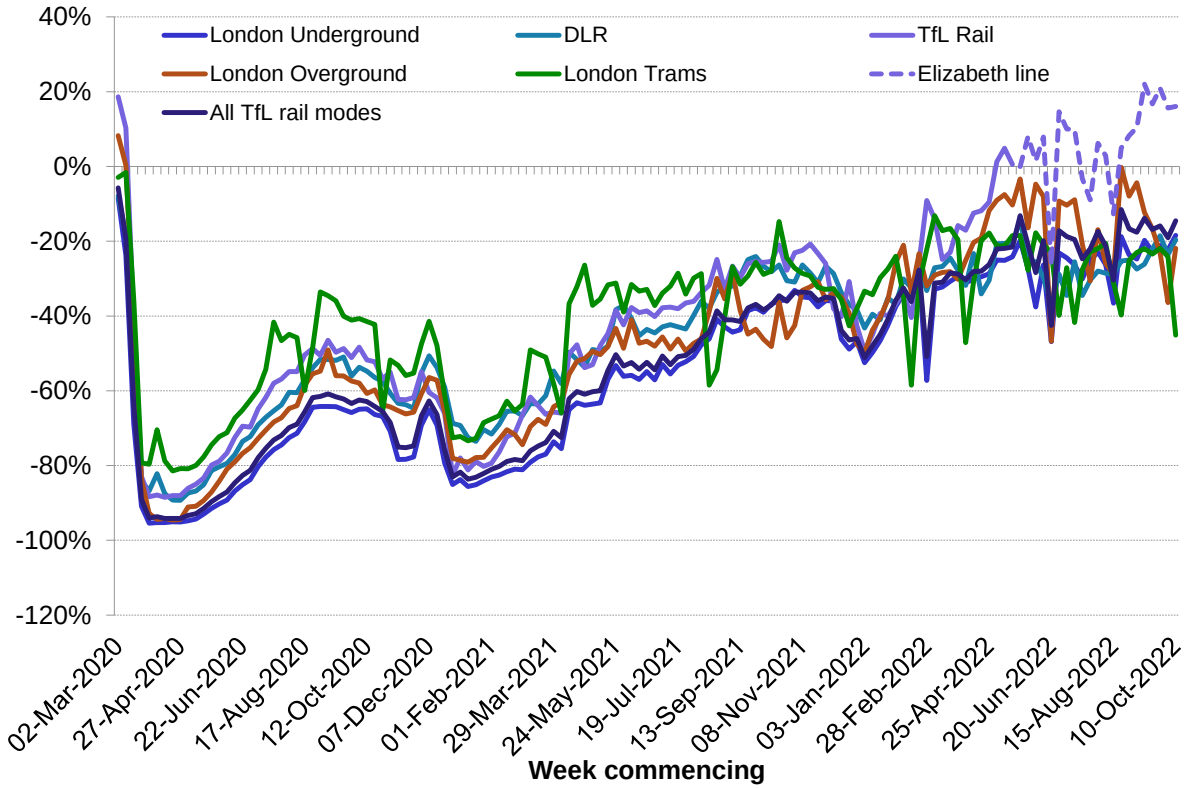
Other TfL rail modes (DLR, London Overground, TfL Rail and London Trams): demand recovery position in the longer-term context

Tables 7.1 and 7.2 above showed that, over the last decade, TfL's rail modes saw substantial increases in patronage due among other things to the continuous expansion of their services.

Looking in more detail at the recent position in the pandemic recovery (figure 7.4), it is clear that:

- The demand fluctuations over the last couple of years have been consistent across all modes, albeit that demand largely remained at lower levels on London Underground. In addition, the differences in recovery levels for each mode have been fading over time.
- As of mid-October 2022, patronage on the DLR was around 80 per cent of the pre-pandemic baseline, with London Overground at about 78 per cent and London Trams at about 76 per cent. This compares to 82 per cent on London Underground and an all-TfL rail modes average of 86 per cent.

Figure 7.4 Average weekly demand on TfL's rail networks compared to the equivalent week before the pandemic, Mar 2020-Oct 2022.

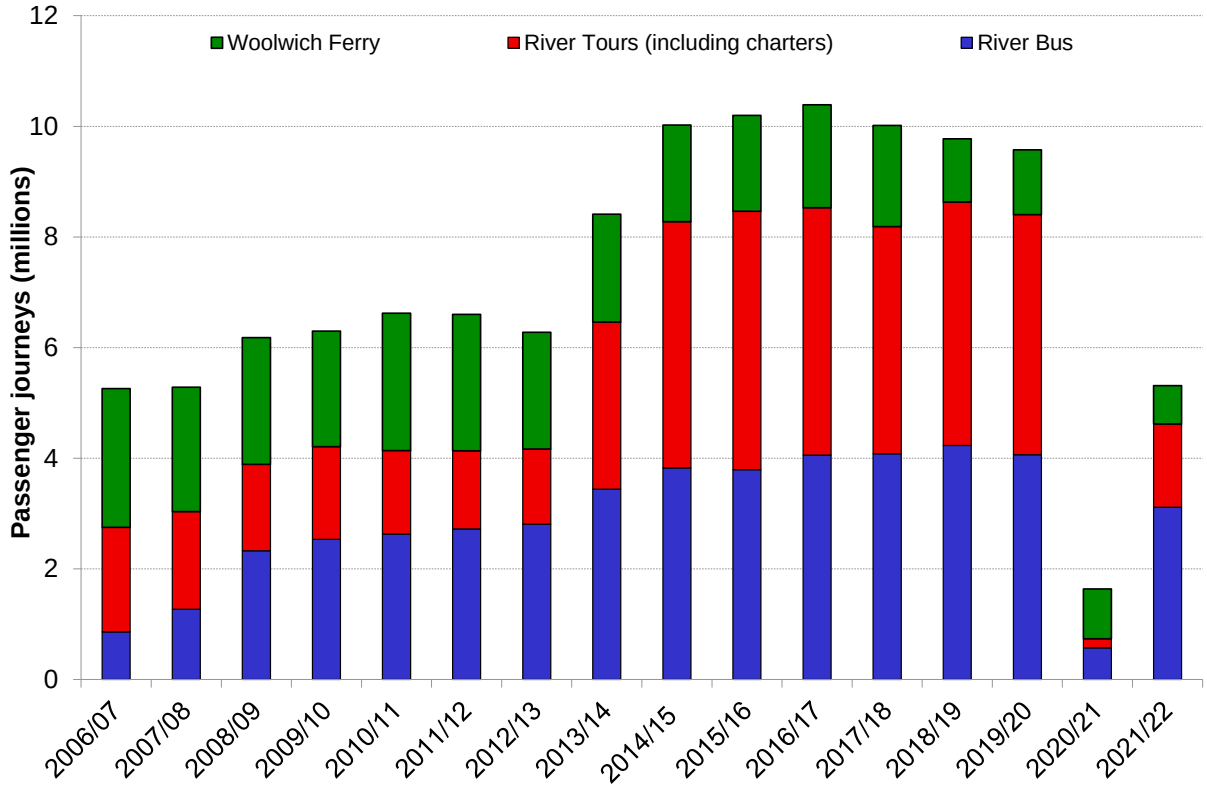


Source: TfL service performance data.
Note: The TfL Rail trend is provided until 23 May 2022 because on 24 May 2022 the Elizabeth line entered service and the comparison with a pre-pandemic baseline is no longer relevant. The Elizabeth line trend is compared to its first week of operation. Elizabeth line demand is covered in more detail in chapter 9.

Other TfL modes (London River Services and IFS Cloud Cable Car): demand recovery position in the longer-term context

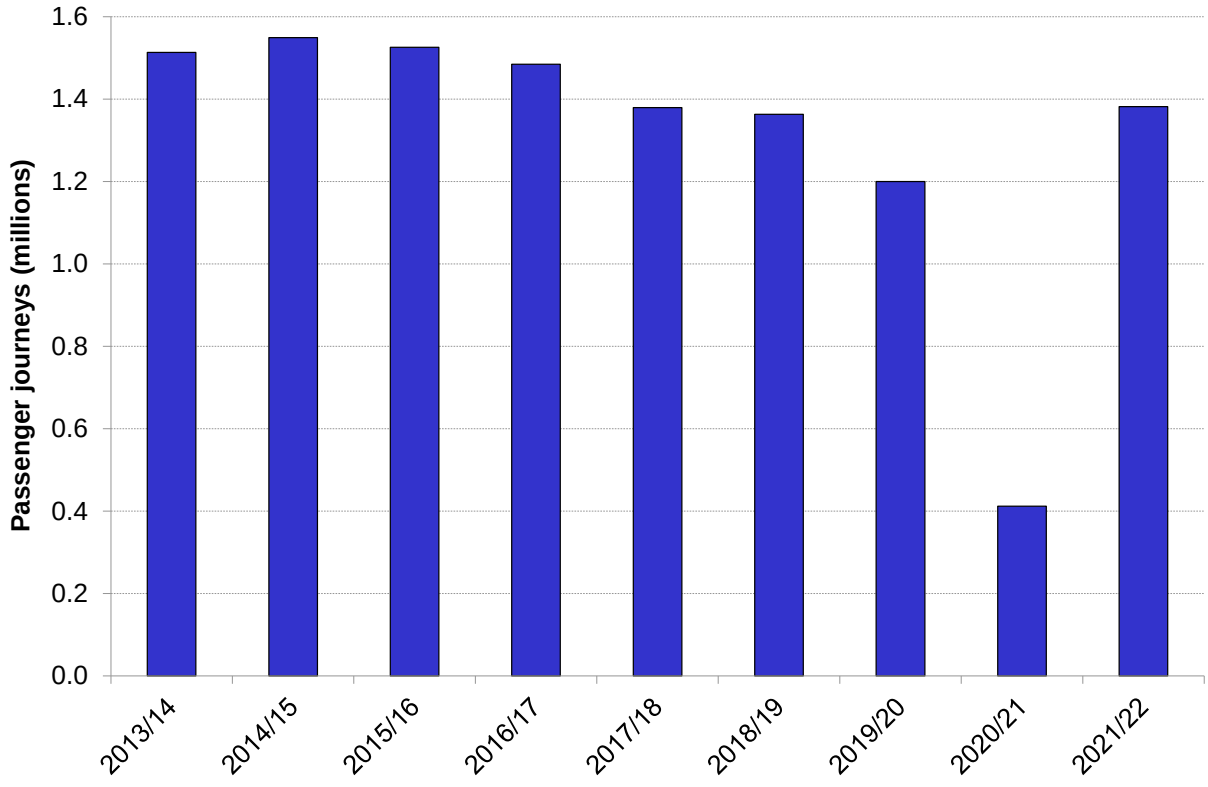
Figure 7.5 shows the latest trends in London River Services by service type. As of 2021/22, overall demand was still 45 per cent lower than before the pandemic.

Figure 7.5 Demand on London River Services, 2006/07-2021/22.



Source: TfL London River Services.

Figure 7.6 Demand on the IFS Cloud Cable Car, 2013/14-2021/22.



Source: TfL service performance data.

However, looking at specific services, the Woolwich Ferry has recovered more rapidly than any of the other services (despite having been affected by industrial action at the beginning of 2022), perhaps due to its strategic nature as a river crossing in the east. The other services, by contrast, receive a much larger share of patronage from international tourism, which was still much subdued in 2021/22.

Figure 7.6, on the other hand, shows how, after years of declining patronage later exacerbated by the pandemic, in 2021/22 the **IFS Cloud Cable Car**, which connects the Greenwich Peninsula to the Royal Docks across the river Thames, saw levels of demand not previously seen since 2017/18.

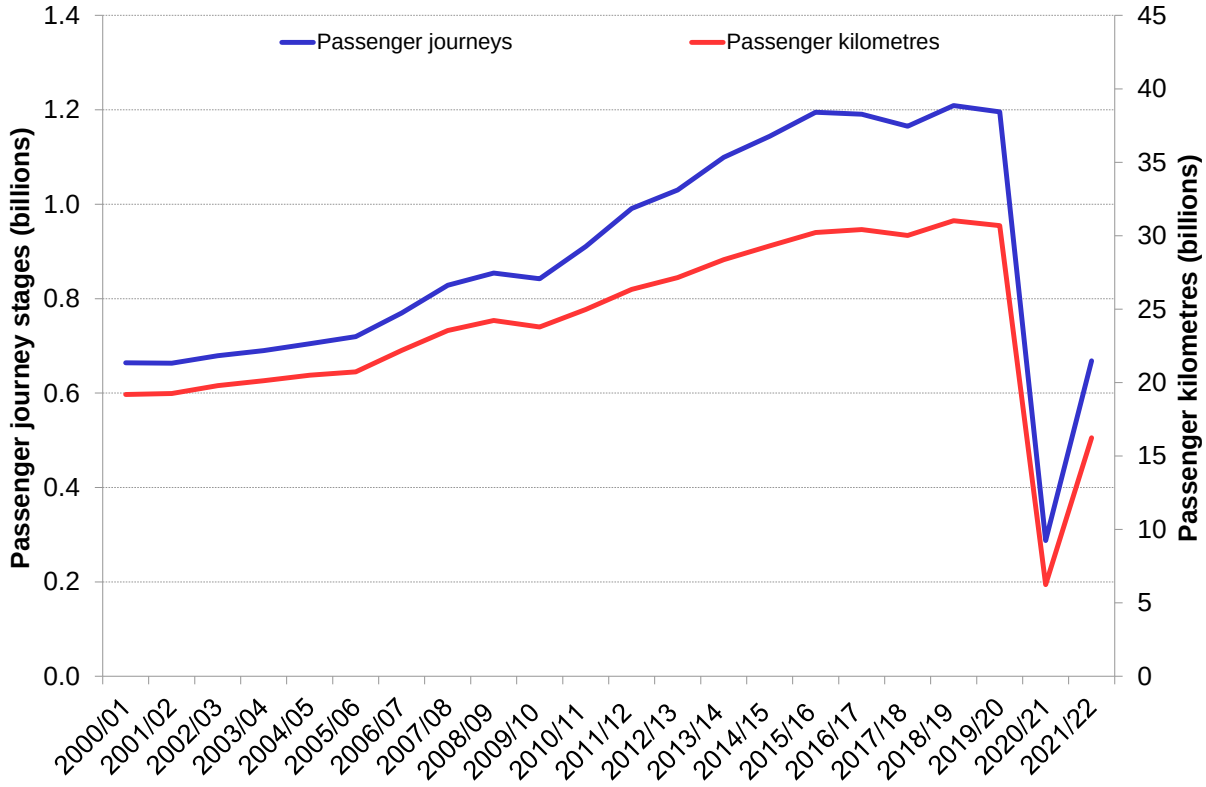
This boost may be partially explained by the efforts to promote the cable car as a domestic tourist attraction in the second half of 2021. In addition, the relocation of London's City Hall and the Greater London Authority's offices to a new home in the Royal Docks, only a few steps away from the cable car terminal, may have also generated new kinds of trips for this service.

National Rail in London: demand recovery position in the longer-term context

This section looks at passenger demand on National Rail services in the London area, using aggregate demand for operators that the Office of Rail and Road (ORR) classifies as franchised in London and the South East as a proxy. As such, this includes a small proportion of travel that does not strictly take place within or across the London boundary.

Figure 7.7 shows the long-term trend in annual passenger journeys and passenger kilometres on National Rail in London and the South East.

Figure 7.7 Passenger kilometres and journeys on National Rail London and South East franchised operators, 2000/01-2021/22.

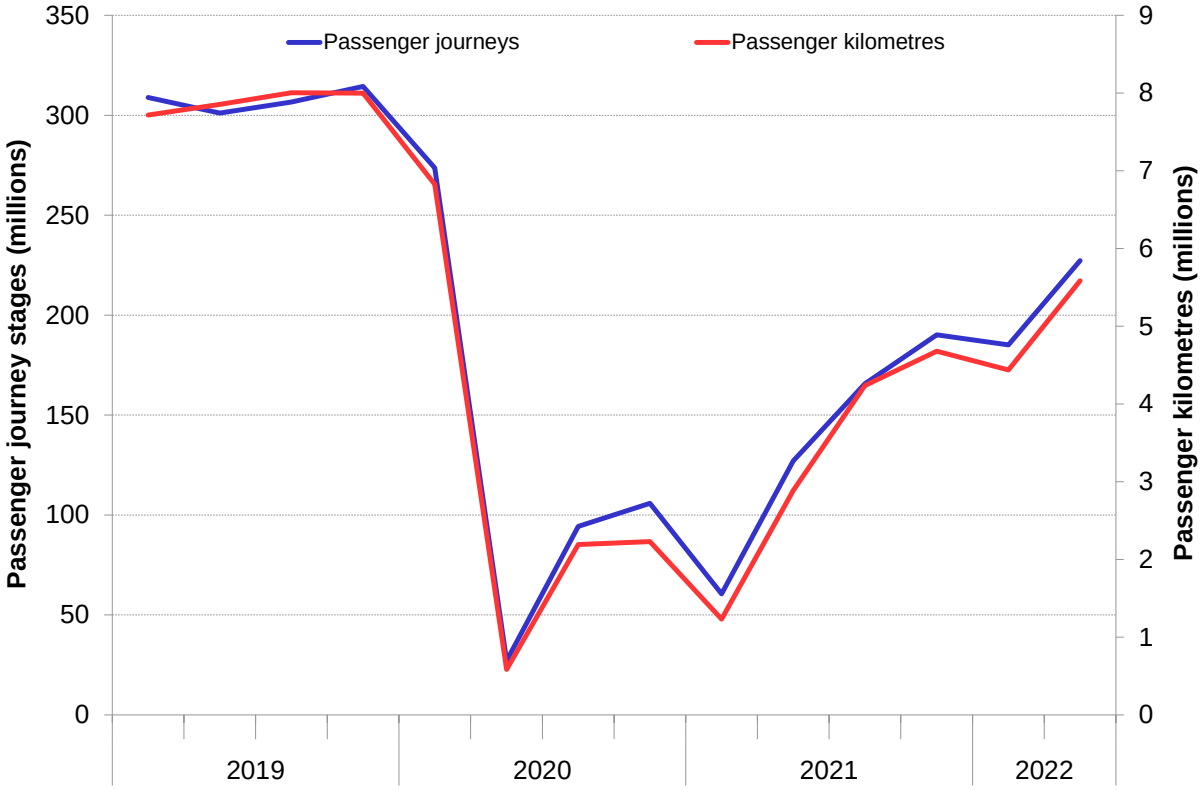


Source: Office of Rail and Road.

The main feature is continuous growth over the first two decades of the millennium (albeit with a slowdown in the late 2010s) followed by a steep drop caused by the coronavirus pandemic, from which demand in 2021/22 had only recovered to 56 per cent in terms of journey stages and 53 per cent in passenger kilometres.

Figure 7.8 shows more recent quarterly demand data for London and South East franchised operators.

Figure 7.8 Recent demand on National Rail London and South East franchised operators, 2019-2022.



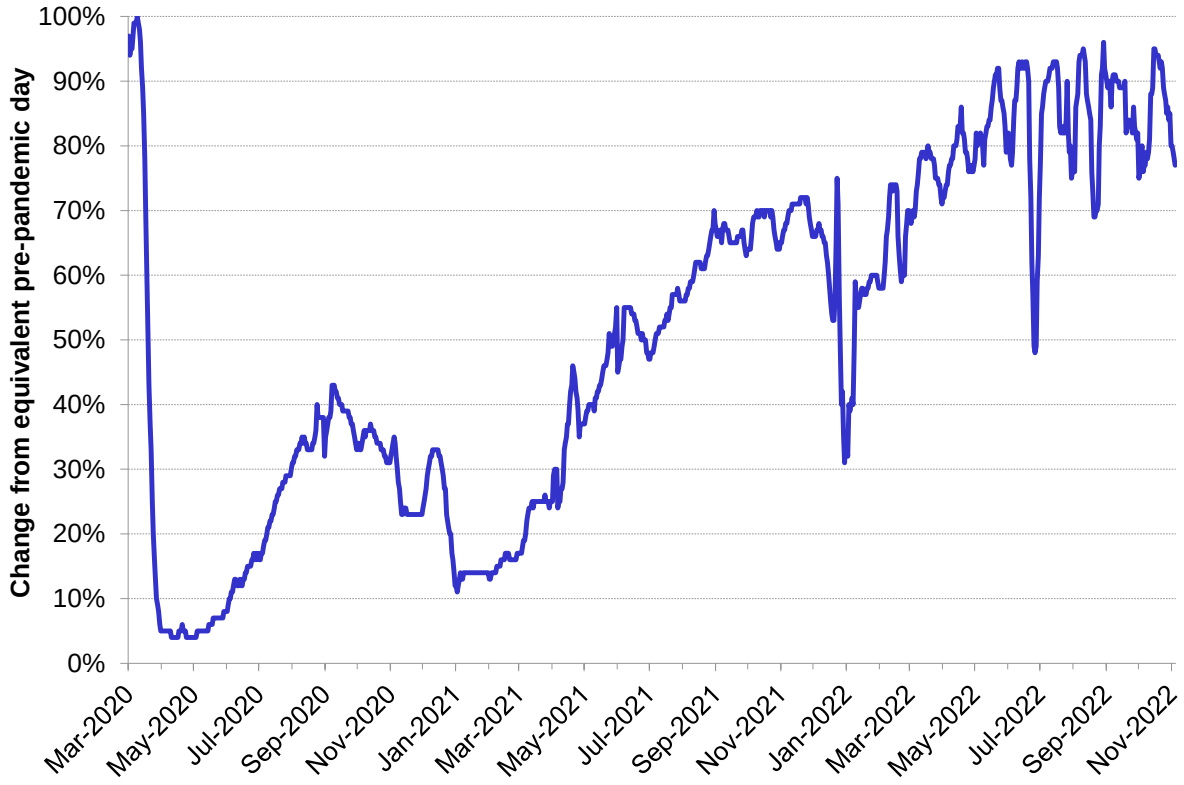
Source: Office of Rail and Road.

The impact of the two major lockdowns in 2020 and 2021 and the one in late 2021 and early 2022 (due to the Omicron variant) are evident. However, more recent quarters seem to point to a healthy return to growth.

By summer 2022 demand on National Rail in London was at some 74 per cent of the pre-pandemic level, on par with other rail modes, notably the London Underground.

While more recent data is not available at the regional level, figure 7.9 illustrates the recovery trend on National Rail across the whole of Great Britain and suggests that, despite the volatility in recent months (at least partly reflecting recent industrial action), recovery at the national level is currently at an average of around 85 per cent of the pre-pandemic demand, which compares to 82 per cent for London Underground and some 80 per cent on other TfL rail modes, suggesting that National Rail recovery may be slightly slower in London than elsewhere in Great Britain.

Figure 7.9 Daily demand on National Rail in Great Britain compared to the equivalent day before the pandemic, Mar 2020-Nov 2022.



Source: Department for Transport.

7.3 Demand on public transport: post-pandemic characteristics

The previous section provided an overview of overall public transport patronage and demand by mode at the aggregate level. However, those aggregated statistics conceal much variation, notably spatially and temporally (days of the week, times of day).

While, historically, changes at these scales tended to be slow and progressive, the coronavirus pandemic accelerated the pace of change of some existing trends and generated new behaviours.

Therefore, although the recovery still has some way to run in terms of establishing settled post-pandemic conditions, it is important to understand which features of pandemic-related travel are persisting into the medium term and the implications that these may have for future public transport policy and for the Mayor's transport aims.

Temporal distribution of demand throughout the week

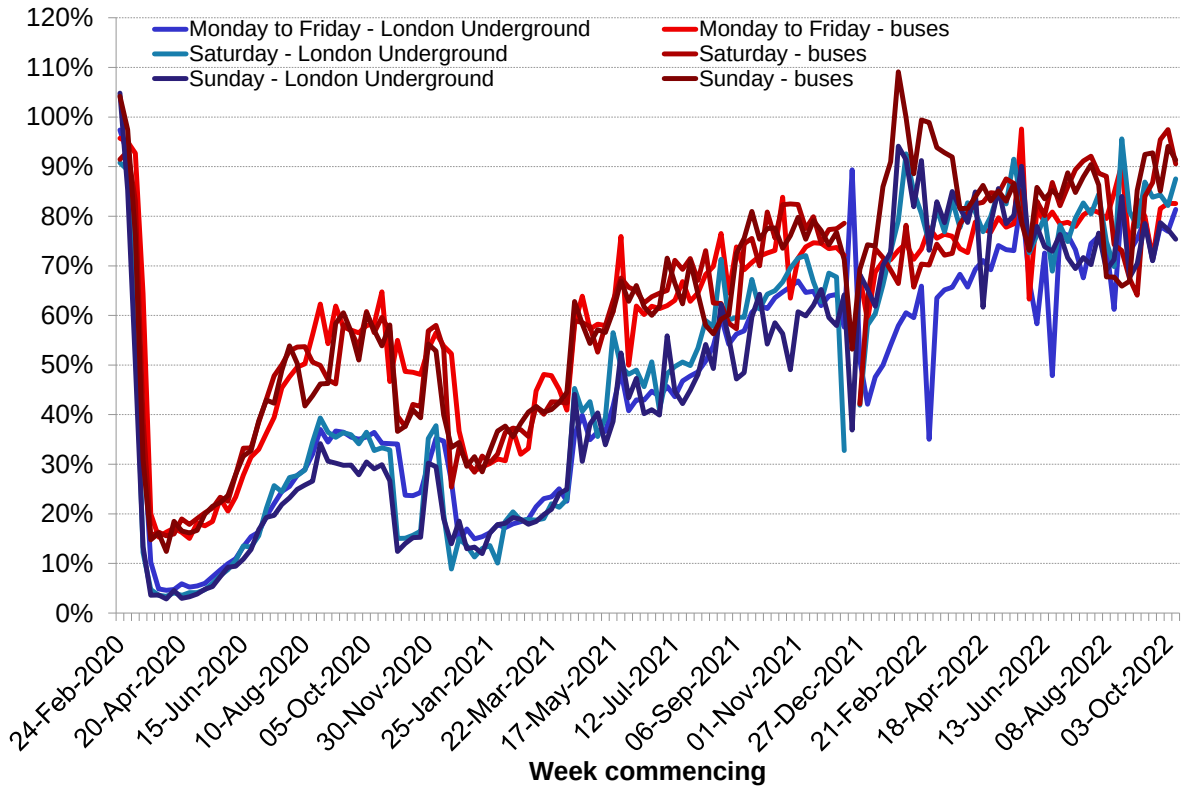
A first feature of interest for public transport demand is the day-to-day variation of demand throughout the week, and whether this is substantially different to what was observed before the pandemic.

Travel in London reports 13 and 14 discussed the early evidence of a 'leisure-led' recovery from the pandemic, where off-peak travel (particularly at weekends) was

returning to pre-pandemic levels at a faster pace than demand during the working week (Monday to Friday).

As shown in figure 7.10, this has continued to be the case throughout 2022. On the London Underground, the difference between the weekday and weekend recovery at the end of September 2022 was 19 percentage points: 92 per cent on Saturdays and Sundays vs 73 per cent on weekdays. On buses this difference was smaller, between 8 and 13 percentage points on Saturday and Sunday respectively compared to a weekday recovery of 81 per cent.

Figure 7.10 Bus and London Underground average daily demand compared to the equivalent week before the pandemic, by day of week, Feb 2020-Oct 2022.



Source: TfL service performance data.

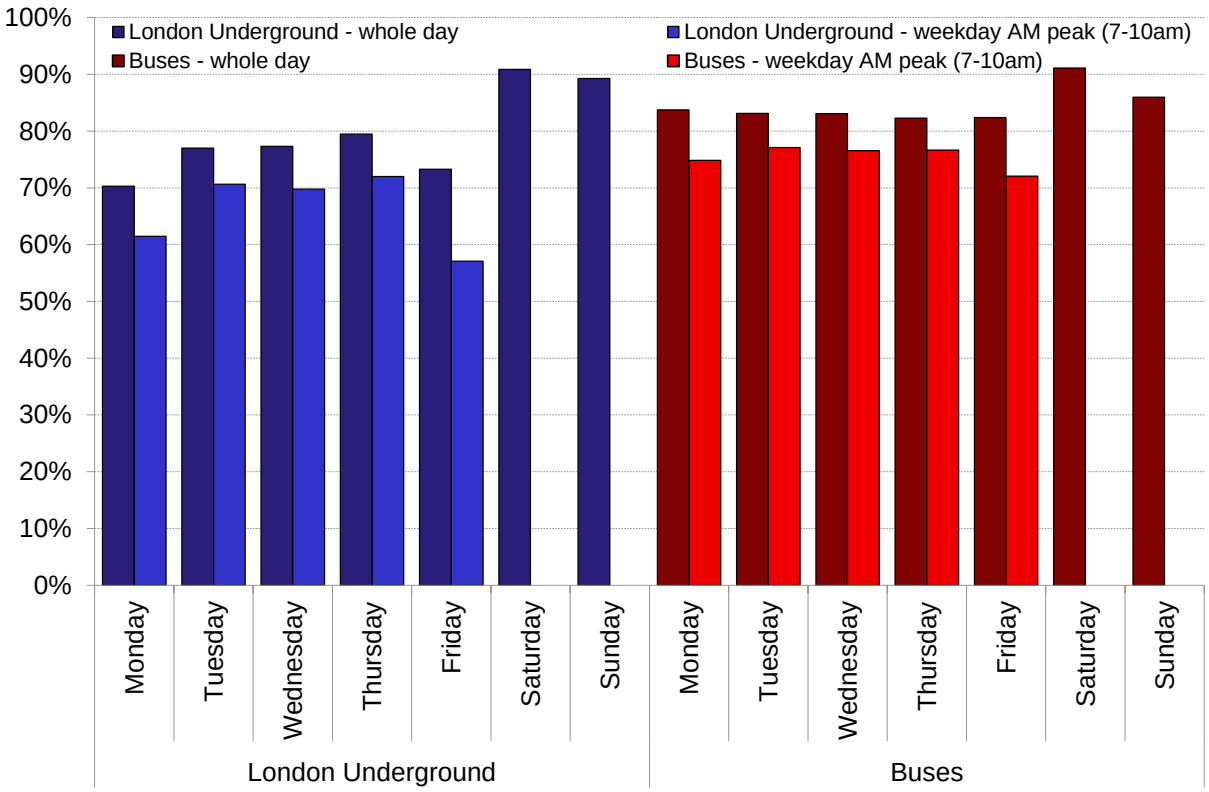
It is worth noting that this difference is in the relative recovery but does not necessarily mean that absolute levels of demand on buses or London Underground are higher on weekends than on weekdays. In fact, this is not and has never been the case at any point during the pandemic, although certainly the absolute level of demand on Saturdays in 2022 has been close to the Monday to Friday average on buses and almost reached it on the London Underground.

Also of interest are the differences in demand across the five days of the traditional working week, hitherto considered to be roughly equivalent in terms of demand and hence service provision.

In 2019, before the coronavirus pandemic, Fridays tended to see the highest level of demand on both buses and London Underground. And since the introduction of Night Tube and Night Overground services on weekends, they were considered a different day type from the Monday to Thursday average for planning purposes, particularly on rail modes.

As is clear from figure 7.11, which shows the relative recovery of each day of the week for a representative week in October 2022 compared to the equivalent week in 2019, the pandemic changed this and there are now reasons to argue for a further disaggregation of the Monday to Thursday grouping into perhaps Mondays on one hand and the Tuesday to Thursday average on the other.

Figure 7.11 London Underground and bus demand recovery, whole day and morning peak, by day of week, week commencing 17 Oct 2022 vs week commencing 14 Oct 2019.



Source: TfL Technology & Data.

The graph shows an important difference between London Underground and buses.

While there were clear differences by weekday on London Underground absolute demand before the pandemic, the uneven recovery trend shown in figure 7.11 suggests that these have exacerbated.

On the other hand, the more even recovery seen on buses, together with the fact that absolute bus demand was also much more stable across the working week before the pandemic, with only minor fluctuations, suggests that these differences among weekdays are a lot less prevalent on buses.

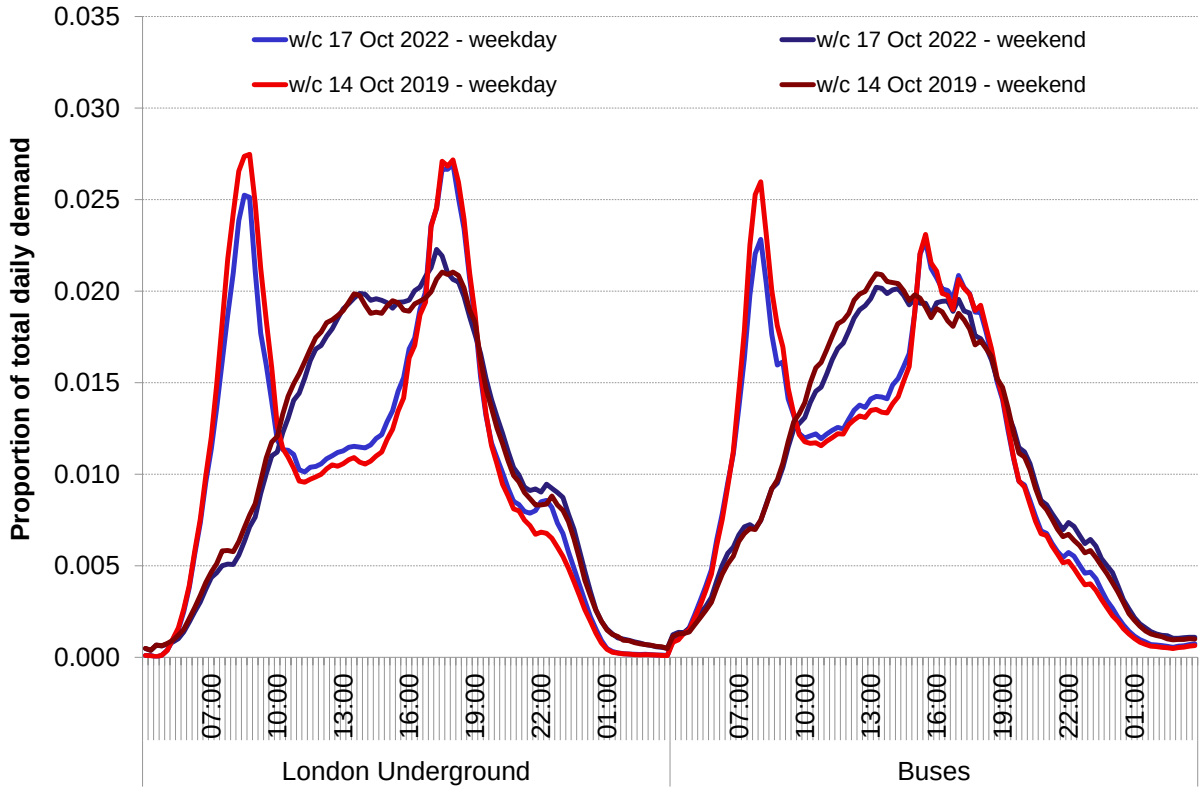
Furthermore, while Fridays used to be the busiest day (in absolute terms) on London Underground before the pandemic, after the pandemic the busiest day is Thursday, and Fridays are typically the second or third quietest after Mondays, which remain the quietest overall. This points to a redistribution of travel during the working week away from the weekdays adjacent to weekends, most likely motivated to take advantage of now well-established remote working practices.

Temporal distribution of demand throughout the day

The distribution of demand across the hours of the day also saw noticeable changes in 2020 and 2021 at the height of the coronavirus pandemic.

Figure 7.12 shows the position at the end of September 2022 for both London Underground and buses and for both weekdays and weekends.

Figure 7.12 Relative London Underground and buses entries/boardings profile by day type and time of day, week commencing 17 Oct 2022 vs week commencing 14 Sep 2019.



Source: TfL Technology & Data.
Note: The daily total represents 100 per cent of the demand.

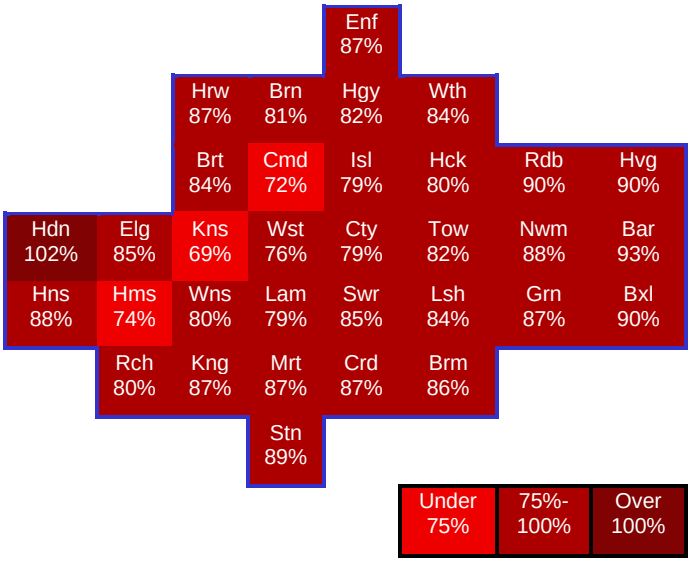
It is clear from the graph that the demand profile has largely returned to what it was before the pandemic for both modes and all days of the week. Note however that the lines represent relative demand normalised to the daily total and not absolute levels of demand.

Spatial distribution of demand

Previous Travel in London reports explored the uneven spatial recovery from the coronavirus pandemic on the main public transport modes and identified noticeable differences between central London (which was recovering slower) and the inner and outer suburbs.

The latest available evidence (figures 7.13 and 7.14) suggests that, to a large extent, the spatial differences in recovery by borough have narrowed.

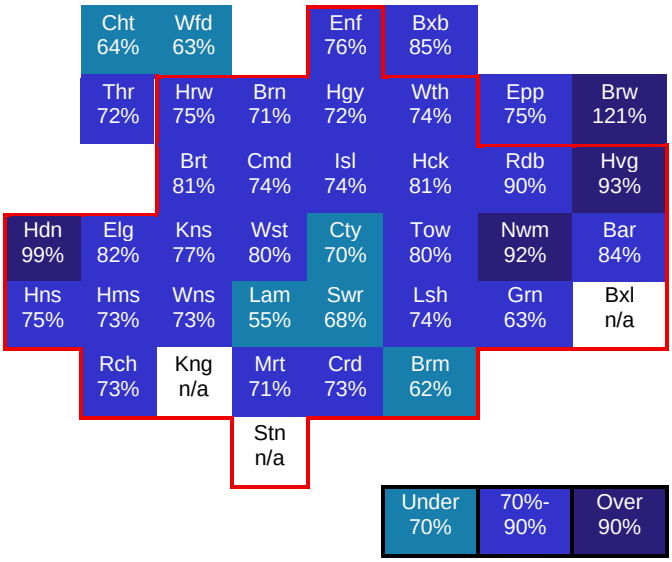
Figure 7.13 Recovery of weekday bus demand by borough, week commencing 26 Sep 2022 vs week commencing 23 Sep 2019.



Bar: Barking & Dagenham
Brn: Barnet
Brm: Bromley
Brt: Brent
Bxl: Bexley
Cmd: Camden
Crd: Croydon
Cty: City of London
Elg: Ealing
Enf: Enfield
Grn: Greenwich
Hck: Hackney
Hdn: Hillingdon
Hgy: Haringey
Hms: Hammersmith & Fulham
Hns: Hounslow
Hrw: Harrow
Hvg: Havering
Isl: Islington
Kng: Kingston upon Thames
Kns: Kensington & Chelsea
Lam: Lambeth
Lsh: Lewisham
Mrt: Merton
Nwm: Newham
Rdb: Redbridge
Rch: Richmond upon Thames
Stn: Sutton
Swr: Southwark
Tow: Tower Hamlets
Wns: Wandsworth
Wst: Westminster
Wth: Waltham Forest

Source: TfL Public Transport Service Planning.

Figure 7.14 London Underground, London Overground and DLR weekday station entries by local authority, week commencing 27 Sep 2022 vs autumn 2019 baseline.



Bar: Barking & Dagenham
Brn: Barnet
Brm: Bromley
Brt: Brent
Brw: Brentwood
Bxb: Broxbourne
Bxl: Bexley
Cht: Chiltern
Cmd: Camden
Crd: Croydon
Cty: City of London
Elg: Ealing
Enf: Enfield
Epp: Epping Forest
Grn: Greenwich
Hck: Hackney
Hdn: Hillingdon
Hgy: Haringey
Hms: Hammersmith & Fulham
Hns: Hounslow
Hrw: Harrow
Hvg: Havering
Isl: Islington
Kng: Kingston upon Thames
Kns: Kensington & Chelsea
Lam: Lambeth
Lsh: Lewisham
Mrt: Merton
Nwm: Newham
Rdb: Redbridge
Rch: Richmond upon Thames
Stn: Sutton
Swr: Southwark
Thr: Three Rivers
Tow: Tower Hamlets
Wfd: Watford
Wns: Wandsworth
Wst: Westminster
Wth: Waltham Forest

Source: TfL Public Transport Service Planning.
Note: Boroughs in the Greater London Authority (GLA) are enclosed within a red line. Some boroughs do not have any London Underground, London Overground or DLR stations and therefore there is no data for them. Conversely, other local authorities outside the GLA with London Underground or London Overground services have been included in the diagram.

This is particularly true for buses, where by late September 2022 all boroughs had recovered to about 70 per cent of the pre-pandemic demand and most of them showed recovery rates of around 80 to 90 per cent (figure 7.13)

On TfL rail modes the recovery has also evened out spatially, but some differences were still noticeable in late September 2022:

- In the City of London, Lambeth and Southwark demand recovery was relatively lower, which can be partly explained by a continued suppression of medium- and

long-distance rail commuting into the main London terminals, located mostly in these central boroughs (such as Liverpool Street, Fenchurch Street and Cannon Street in the City of London; London Bridge in Southwark; and Waterloo, Waterloo East and Vauxhall in Lambeth).
- Conversely, in some outer London boroughs in the east and west demand recovery was slightly higher, which is thought to be related to the opening of the Elizabeth line and an increase in demand at feeder stations that serve it.

It is important to note that these relative metrics conceal absolute levels of demand, and thus a smaller relative recovery in a typically busy borough could represent many more journeys than a higher recovery in another borough with lower-than-average pre-pandemic demand.

Frequency and intensity of travel: smartcard payments analysis

By analysing the transactions made by smart payment methods (such as Oyster or contactless payment methods) it is possible to break down the overall public transport recovery value into three fundamental components:

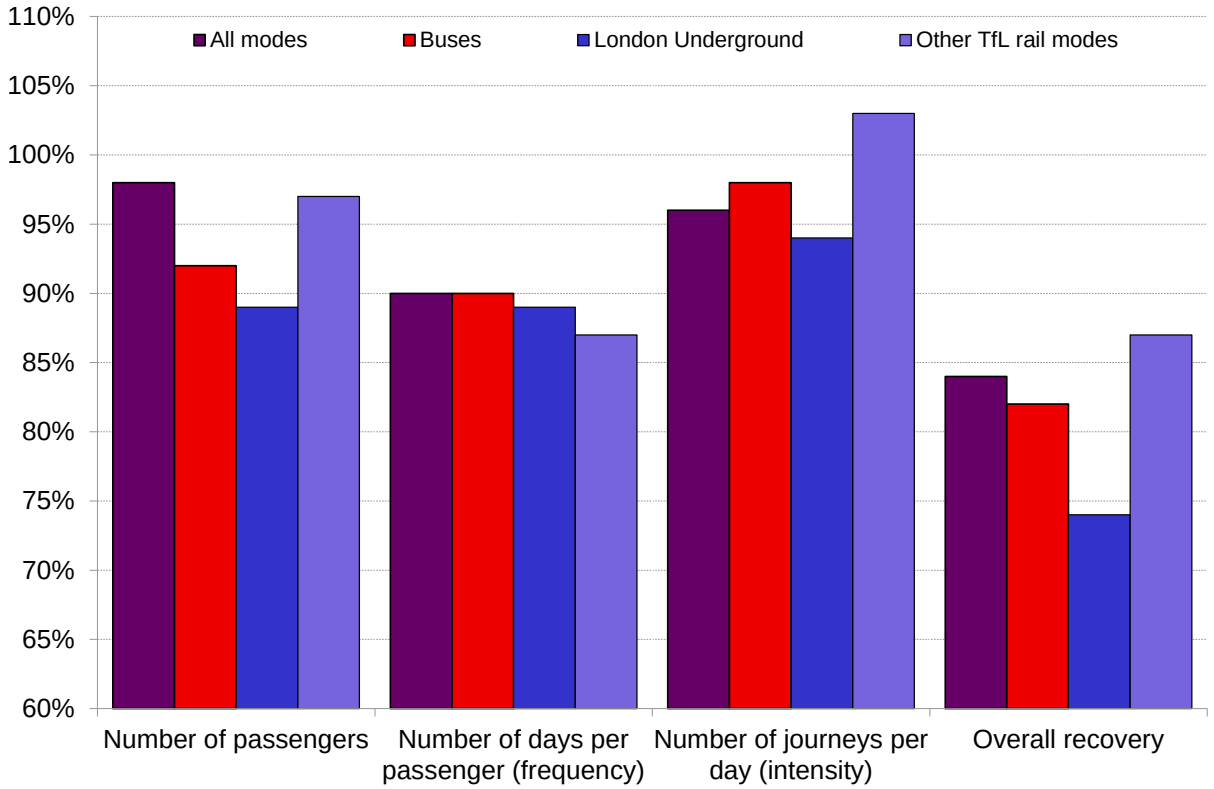
- Recovery of the number of **'individual passengers'** travelling: while this cannot be known exactly since the same person may use more than one payment method, the number of individual payment IDs detected on the network within a given period is a good proxy for the number of individual passengers travelling over that period and responds to the question of 'how many people are travelling relative to before the pandemic'.
- Recovery of the number of **'travelling days per passenger'**: once individual payment IDs ('passengers') are identified for a given period, it is possible to calculate on how many days each of those 'passengers' travelled within that period, which is a proxy for frequency of travel and responds to the question 'how often is each person travelling on average compared to before the pandemic'.
- Recovery of the number of **'journeys (per passenger) per day'**: finally, for each individual payment ID ('passenger') and travel day, it is possible to calculate the number of journeys made on that day, which is an indicator of 'intensity of travel' and responds to the question of 'how many journeys is each person making on average on the days they travel compared to before the pandemic'.

Figure 7.15 shows this analysis broken down by main TfL public transport mode for the last week of September 2022 compared to an equivalent week before the pandemic.

The breakdown of the nominal 84 per cent overall recovery on figure 7.15 across all modes shows that the biggest component of the 'missing demand' is a relatively larger reduction in the number of days travelled per person (at 90 per cent) as opposed to a reduction in the number of people travelling at all (at 98 per cent of the pre-pandemic level) or substantial changes in the number of journeys made on each of the travel days (at 96 per cent).

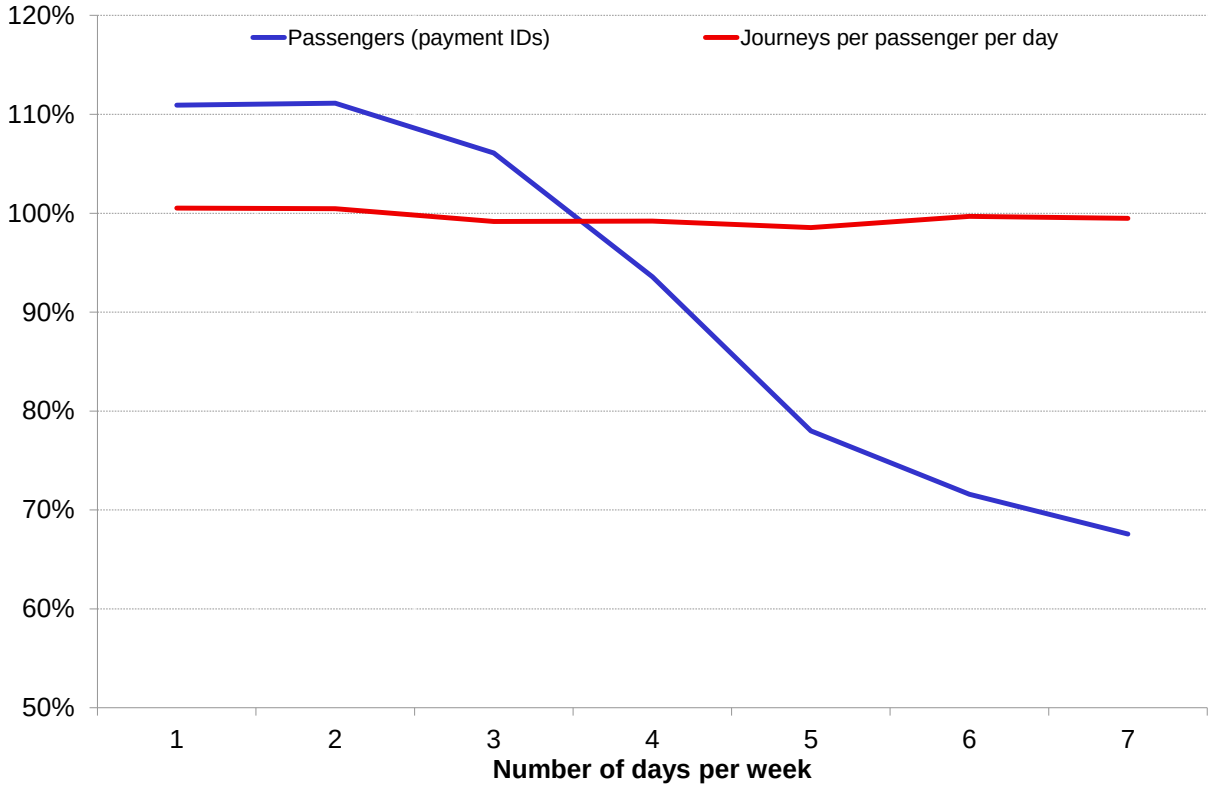
This is consistent with other observations and agrees with the hypothesis that hybrid working practices, which have become more established since the pandemic, are primarily responsible for a reduction in the frequency of commuting and much of the missing patronage on public transport.

Figure 7.15 Indicative components of public transport recovery by main mode, week ending 1 Oct 2022 vs week ending 28 Sep 2019.



Source: TfL Technology & Data.

Figure 7.16 Recovery of 'passengers' and 'journeys per day' by weekly frequency of travel, week ending 1 Oct 2022 vs week ending 28 Sep 2019.



Source: TfL Technology & Data.

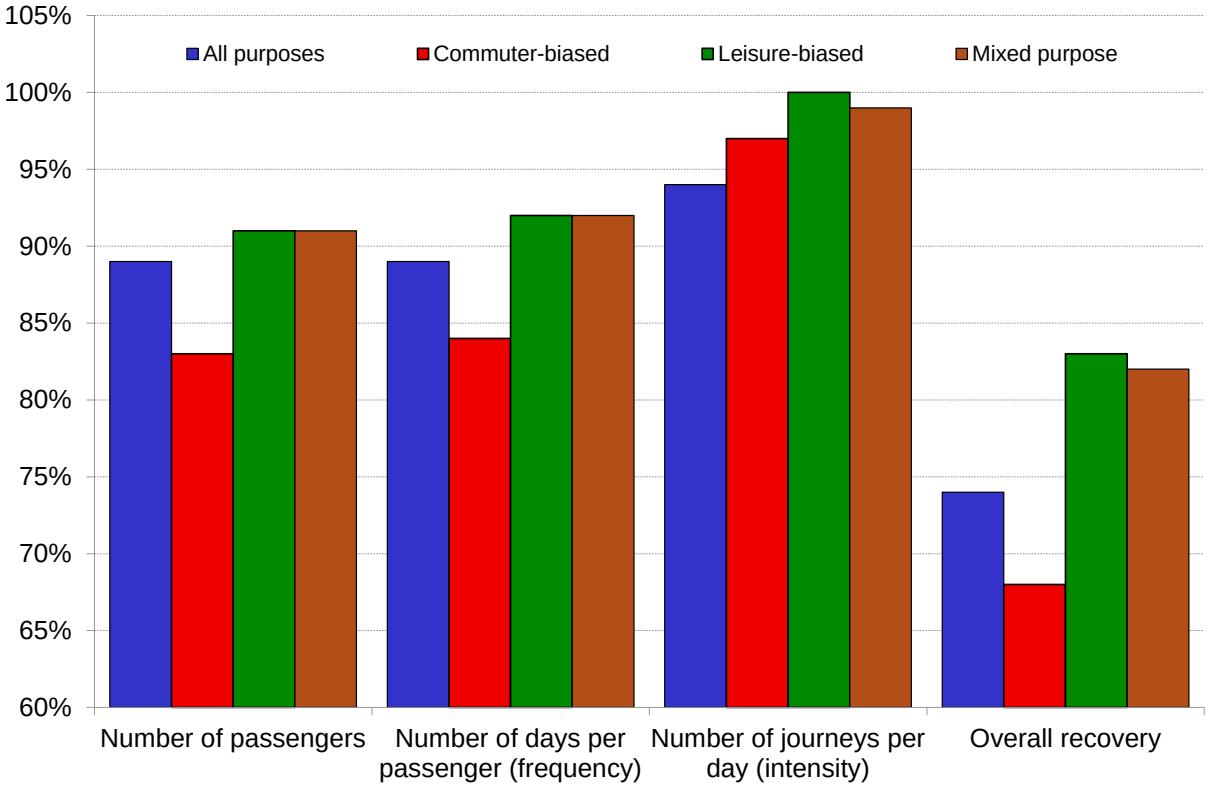
Interestingly, however, this consolidation of travel into fewer days during the week does not seem to lead to more journeys on those travel days ('intensity of travel'), which are almost on par with the level before the pandemic (at 96 per cent).

Figure 7.16 clearly illustrates this point and further shows that the recovery in the number of 'passengers' who travel on one, two, three, and so on days per week compared to before the pandemic drops substantially after three days, suggesting that at this point a segment of the London population seems to have settled into a two- or three-day commuting week with maybe one day of travel on public transport over the weekend, with relatively fewer people travelling on five or more days a week.

These trends are largely consistent across the main modes (bus, London Underground and other TfL rail – see figure 7.15), although London Underground seems to be seeing relatively fewer 'individual passengers' travelling than other modes while the results for other TfL rail modes reflect new generated demand after the opening of the Elizabeth line, affecting particularly the intensity metric.

Finally, figure 7.17 shows tentative trends for London Underground by broad journey purpose (inferred from the origin and destination station types), suggesting that 'commuter-biased' journeys are recovering relatively more slowly than 'leisure-biased' and 'mixed-purpose' journeys, largely due to relatively fewer people travelling and a relatively higher reduction in the number of days travelled per week.

Figure 7.17 Indicative components by inferred purpose of London Underground recovery by indicative purpose, week ending 1 Oct 2022 vs week ending 28 Sep 2019.



Source: TfL Technology & Data.

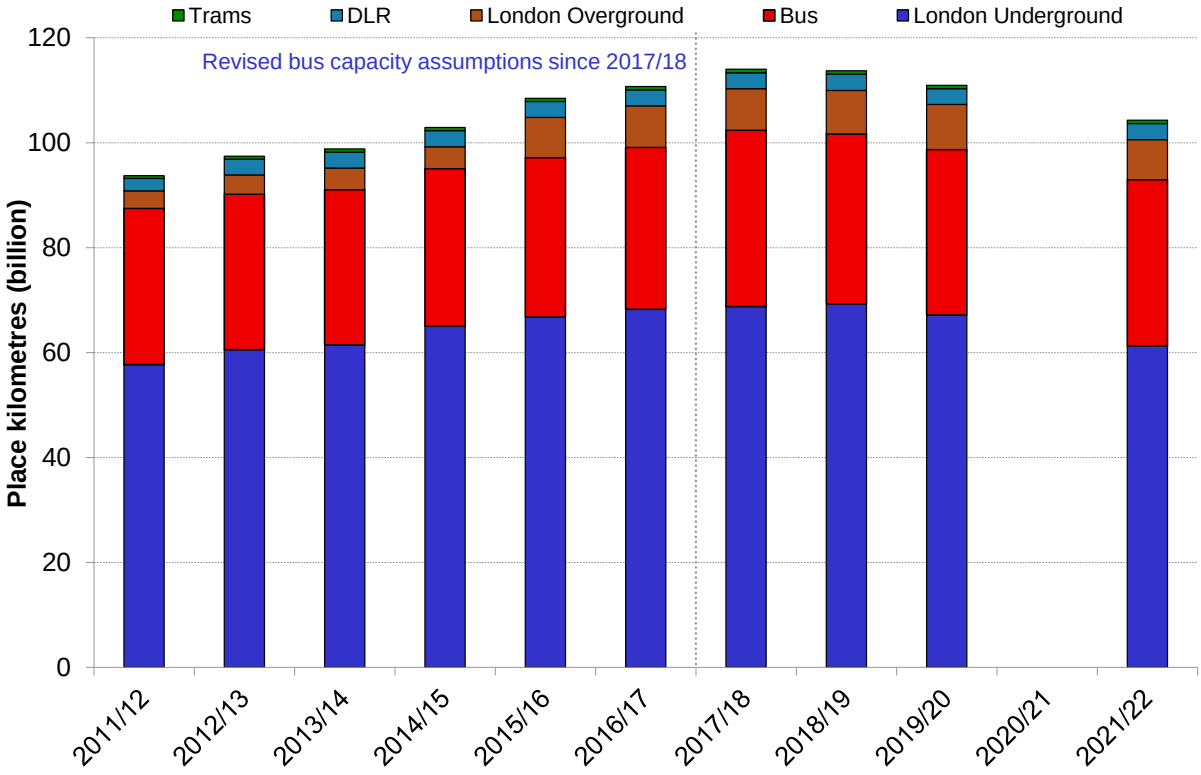
7.4 Service provision and operational performance on public transport modes

This section provides an overview of service provision and operational performance on public transport at an aggregate and modal level, focusing on the current position in the long-term context.

Overall trends in TfL's public transport provision

After two decades of continuous increase in capacity on the main public transport modes, following upgrades and extensions to the various networks, the years just before the pandemic saw a small decrease in overall capacity. This was mostly due to planned service reductions on buses and trams (figure 7.18).

Figure 7.18 Capacity (million place kilometres) provided by the main public transport modes, 2011/12-2021/22.



Source: TfL City Planning.
Note: Values for rail modes represent capacity using a standing density assumption of four people per square metre. Also, due to unavailability of the bus figure for 2020/21 it is not possible to show the total capacity for that year.

Operational exigencies during the pandemic caused further capacity reductions on most modes (particularly on London Overground, London Underground and buses). Within and despite this, however, TfL continued to provide good levels of service to support essential activities during the pandemic as part of the wider national effort.

For the 2021/22 financial year, and despite some pandemic restrictions lasting well into 2021, overall capacity had recovered to 94 per cent of the 2019/20 baseline.

Table 7.3 provides more detail on these trends, while table 7.4 puts these in the context of aggregate demand for the same modes, comparing the relative changes in place kilometres to the changes in passenger kilometres.

Table 7.3 Capacity (million place kilometres) provided by the main public transport modes, 2011/12-2021/22.

Year	Bus	LU	DLR	LO	Trams	Total	Year-on-year change
2011/12	29,804	57,694	2,371	3,317	536	**93,722**	**6.3%**
2012/13	29,626	60,572	2,980	3,686	574	**97,439**	**4.0%**
2013/14	29,605	61,461	3,061	4,106	599	**98,832**	**1.4%**
2014/15	30,057	65,010	3,083	4,153	596	**102,899**	**4.1%**
2015/16	30,386	66,793	3,029	7,653	601	**108,550**	**5.5%**
2016/17	30,903	68,239	3,065	7,884	634	**110,711**	**2.0%**
2017/18	33,602	68,789	3,060	7,905	653	**114,066**[1]	**n/a**[1]
2018/19	32,360	69,310	3,095	8,312	640	**113,718**	**-0.3%**
2019/20	31,529[2]	67,171	3,029	8,587	632	**110,948**	**-2.4%**
2020/21	n/a[3]	59,263	3,068	6,441	598	**n/a**	**n/a**
2021/22	31,755[4]	61,226	3,085	7,594	625	**104,286**	**n/a**
Change in 2021/22 from 2019/20 (best pre-pandemic baseline)							
	0.7%	*-8.9%*	*1.8%*	*-11.6%*	*-1.0%*	*-6%*	

Source: TfL City Planning.
Note: Values for rail modes represent capacity using a standing density assumption of four people per square metre.
1: A new methodology to calculate bus capacity was introduced in 2017/18, so values before this break are not comparable.
2: This value is subject to minor issues with the definition of some bus route capacities but is broadly accurate.
3: Various changes to capacity restrictions on buses, alongside the introduction of extra school services outside the contracted network mean that this figure cannot be accurately calculated for this financial year.
4: This value does not include the extra school services operated during the pandemic in 2021.

Table 7.4 Demand and supply indexed change on the main TfL modes (buses, London Underground, DLR, London Overground and London Trams), 2011/12-2021/22.

	Index: 2011/12 = 100		**Index: 2017/18 = 100**	
Year	**Demand**	**Supply**	**Demand**	**Supply**
2011/12	100	100	-	-
2012/13	104	104	-	-
2013/14	108	105	-	-
2014/15	111	110	-	-
2015/16	117	116	-	-
2016/17	119	118	-	-
2017/18	-	-	100	100
2018/19	-	-	102	100
2019/20	-	-	98	97
2020/21	-	-	30	n/a
2021/22	-	-	62	91

Source: TfL City Planning.

Buses: service provision and operational performance

In the 2021/22 financial year, bus service provision (in terms of scheduled kilometres) returned to the 2019/20 level but remained below the high point reached in the mid-2010s (table 7.5).

Table 7.5 Bus service provision and reliability, 2011/12-2021/22.

		Scheduled kilometres...			
Year	Scheduled kilometres (millions)	...operated	...lost due to congestion[1]	...lost due to other causes[2]	Average speed (mph)
2011/12	502	97.6%	1.9%	0.5%	
2012/13	503	97.6%	1.7%	0.7%	
2013/14	502	97.7%	1.9%	0.4%	9.6
2014/15	504	97.1%	2.0%	0.9%	9.5
2015/16	507	97.2%	2.3%	0.5%	9.3
2016/17	508	97.4%	2.0%	0.6%	9.2
2017/18	500	98.1%	1.4%	0.5%	9.3
2018/19	491	98.1%	1.3%	0.5%	9.3
2019/20	486	97.8%	1.5%	0.7%	9.3
2020/21	471	98.7%	1.5%	0.5%	10.3
2021/22	486	97.9%	1.2%	0.9%	9.6

Source: London Buses.
1: Includes other lost kilometres outside the control of the operator.
2: Includes all lost kilometres within the control of the operator.

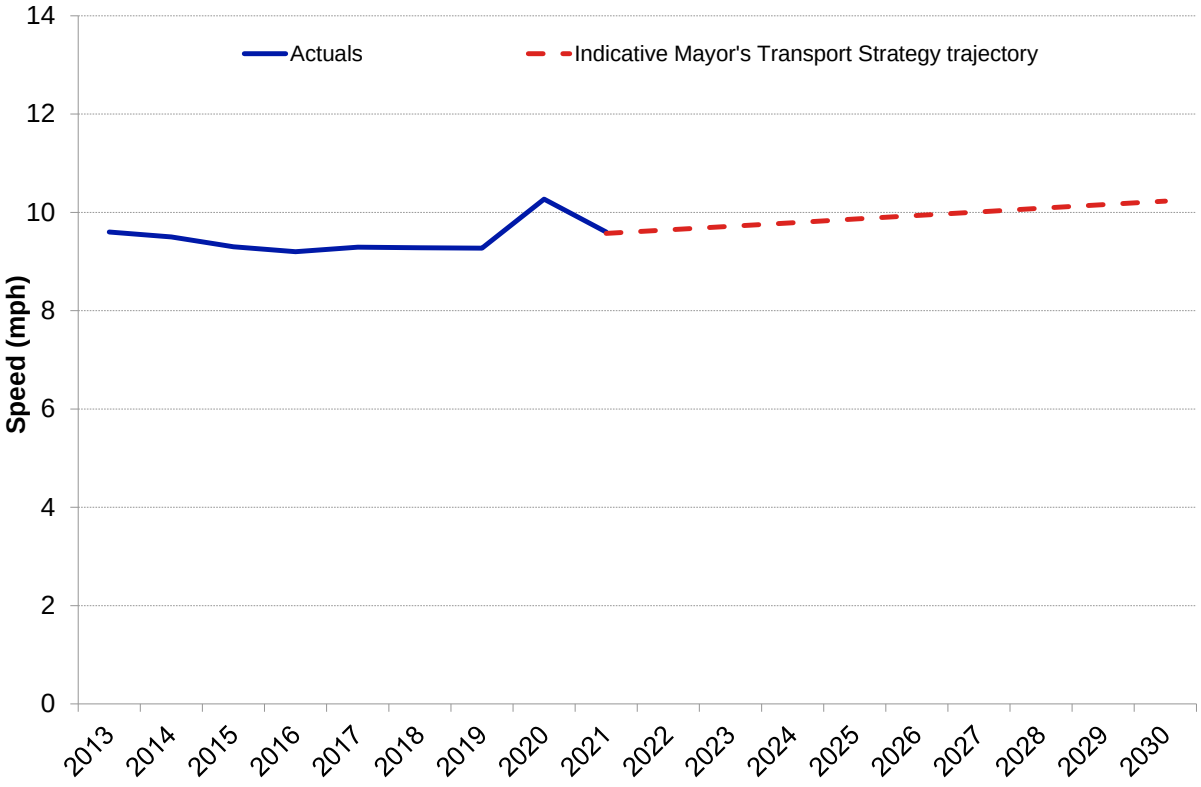
Similar return-to-normal trends were observed for the service reliability indicators, particularly for the proportion of scheduled kilometres operated, which dropped slightly from 2020 albeit with a lower share of lost kilometres due to congestion and a slightly larger share due to other reasons.

Bus speeds also saw a small decline from the high point during the pandemic year (where general traffic demand was subdued) but remained higher than in 2019/20, perhaps reflecting a combination of lasting impacts of restrictions in 2021/22, slightly reduced demand for car travel since the pandemic, and continuing investment in bus priority.

Network-wide average bus speed is a strategic outcome of the Mayor's Transport Strategy. An overview of historic performance in the context of the Mayor's ambition is provided in figure 7.19.

Finally, table 7.6 gathers other reliability indicators for high- and low-frequency bus services and shows that in 2021/22 some of the gains from the years of the pandemic started to reverse, but still with net gains compared to before the pandemic in 2019/20, although it is not possible to draw definitive conclusions until more data is available because the earlier part of the 2021/22 financial year was still affected by some pandemic restrictions.

Figure 7.19 Average bus network speed, 2013-2030.



Source: London Buses.
Note: Actuals are calculated on a financial year basis. For example, 2013 on the graph refers to 2013/14.

Table 7.6 Bus punctuality and reliability by service type, 2011/12-2021/22.

	High-frequency services[1]			Low-frequency services[1]
	Average wait time (min)		Customer journey time (min)	
Year	Actual	Excess		Timetabled services on time[2]
2011/12	5.4	1.0	-	83.2%
2012/13	5.9	1.0	-	83.6%
2013/14	5.9	1.0	-	82.5%
2014/15	6.0	1.1	-	81.8%
2015/16	6.1	1.2	-	80.6%
2016/17	6.1	1.1	-	80.1%
2017/18	6.0	1.0	32.4	82.3%
2018/19	6.1	1.0	32.5	82.3%
2019/20	6.2	1.0	32.2	83.3%
2020/21	6.1	0.6	30.5	89.5%
2021/22	6.1	0.9	31.8	84.4%

Source: London Buses.
Note: In 2012/13 (high-frequency) and 2013/14 (low-frequency) there was a methodology change.
1. High/low frequency: operating with a scheduled frequency of five or more/less than five buses per hour.
2. Buses are defined as 'on time' if departing between 2.5 and five minutes after their scheduled departure times.

London Underground: service provision and operational performance

Table 7.7 shows selected indicators of service provision and operational performance for the London Underground.

Table 7.7 London Underground service performance, 2011/12-2021/22.

Year	Scheduled kilometres (millions)	Operated kilometres (millions)	Scheduled kilometres operated	Average generalised journey time (min)	Excess journey time[1] (min)	Share of excess in generalised journey time
2011/12	74.6	72.4	97.0%	45.1	5.8	12.9%
2012/13	77.5	75.6	97.6%	43.6	5.3	12.1%
2013/14	78.2	76.2	97.5%	43.4	5.2	12.0%
2014/15	82.3	80.3	97.6%	42.3	4.6	11.0%
2015/16	84.5	82.4	97.5%	41.7	4.6	11.0%
2016/17	86.3	83.7	96.9%	41.7	4.7	11.0%
2017/18	87.3	84.3	96.6%	41.6	4.6	11.2%
2018/19	87.8	85.0	96.8%	41.6	4.6	11.0%
2019/20	87.7	82.4	94.0%	41.9[2]	5.0[2]	11.8%[2]
2020/21	83.3	72.6	87.2%	n/a	n/a[3]	n/a[3]
2021/22	84.9	74.9	88.2%	n/a	n/a[3]	n/a[3]

Source: London Underground.
1: Difference between actual journey time and time if services run to time, weighted to reflect how customers value time.
2: Average from financial periods 1 to 12. Period 13 was excluded because it was impacted by the coronavirus pandemic.
3: While demand remains subdued due to the coronavirus pandemic, it is not possible to compute excess journey time.

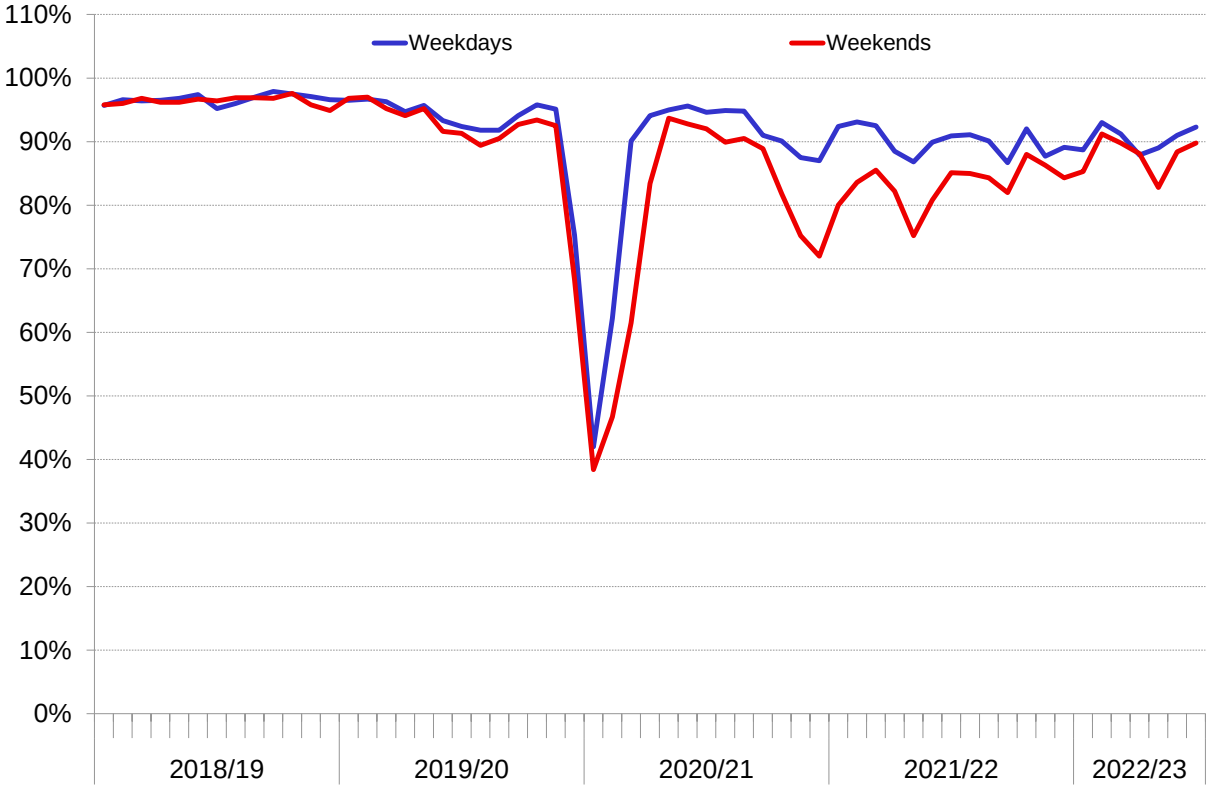
In 2021/22, scheduled kilometres started to bounce back after the pandemic, albeit to a level below 2019/20, possibly owing to the continued closure of the Waterloo & City line (which reopened in stages from June 2021) and of Night Tube services (many of which only resumed in 2022/23).

Similarly, the proportion of scheduled kilometres operated also increased but remained below the excellent levels seen for much of the previous decade.

It is also possible to explore more recent trends in London Underground operational performance by looking at the service operated metric (figure 7.20). This metric compares the actual number of train trips against those scheduled using a predefined set of measuring points. The schedule includes adjustments for planned closures, weekend engineering works, and timetable notices.

The results from this graph show that despite a very quick recovery in the service operated following the first lockdown, throughout 2020/21 and 2021/22 the service operated did not quite reach the level and consistency seen before the pandemic. There were persisting differences between weekdays and weekends well into late 2021/22 (with the latter showing noticeably lower levels of service). However, indicators from the first half of 2022/23 show positive signs of further recovery.

Figure 7.20 Service operated metric on London Underground by financial period, 2018/19-2022/23.



Source: London Underground.

DLR: service provision and operational performance

A slightly slower return to normal service was observed on DLR services (table 7.8).

Table 7.8 DLR service provision and reliability, 2011/12-2021/22.

Year	Operated kilometres (millions)	Scheduled services operated	Excess wait time (min)	Network availability measure
2011/12	4.9	97.7%	0.23	94.7%
2012/13	5.7	98.5%	0.14	97.8%
2013/14	5.8	99.2%	0.08	98.6%
2014/15	5.8	99.3%	0.07	99.1%
2015/16	5.9	98.5%	0.09	99.2%
2016/17	6.0	99.0%	0.10	99.1%
2017/18	6.1	98.4%	0.11	98.0%
2018/19	6.1	99.0%	0.09	99.1%
2019/20	6.1	99.0%	0.11	99.1%
2020/21	5.1	99.3%	0.08	99.0%
2021/22	5.2	98.5%	0.11	98.4%

Source: DLR.
Note: The network availability metric accounts for the geographical extent and the duration of planned closures and, with appropriate weightings, provides an estimate of how much of the network is available for customers (100 per cent represents the whole DLR network open for all service hours).

The number of operated kilometres increased slightly in 2021/22 due to the restoration of some services from autumn 2020, but this did not compensate for the larger reductions in provision that took place earlier on in the pandemic.

In terms of reliability, the slight deterioration in the proportion of scheduled services operated and excess wait time is thought to be mostly due to three major incidents (two power supply failures and an industrial action day) in the first quarter of 2022.

On the other hand, the small reduction in network availability reflects various other causes such as regular maintenance scheduling (involving track and station closures sometimes during service hours), closures to facilitate works by third parties (for example in relation to the Bank station upgrade or Network Rail works) and closures for preparatory works related to the DLR Rolling Stock Replacement Programme.

A new timetable for the DLR was introduced in late September 2022, which is expected to reduce waiting times, crowding and improve connectivity. However, its impacts will not be apparent on these annualised metrics until at least 2022/23.

London Overground and TfL Rail: service provision and operational performance

London Overground and TfL Rail both saw a net increase in service provision in 2021/22 compared to before the pandemic, and indeed to the highest levels on record (table 7.9).

Table 7.9 London Overground and TfL Rail service provision and reliability (annual average of the Public Performance Measure), 2011/12-2021/22.

	Operated train kilometres (millions)		Public Performance Measure (PPM)	
Year	London Overground	TfL Rail	London Overground	TfL Rail
2011/12	5.6	-	95.7%	-
2012/13	6.1	-	96.1%	-
2013/14	6.0	-	95.8%	-
2014/15	6.0	-	95.0%	-
2015/16	8.1	2.3	94.4%	91.4%
2016/17	7.9	2.7	94.5%	91.8%
2017/18	8.2	2.8	94.4%	89.8%
2018/19	8.7	3.8	93.8%	93.8%
2019/20	8.7	4.7	92.6%	95.2%
2020/21	7.9	5.9	96.2%	96.0%
2021/22	9.1	6.6	95.2%	94.2%

Source: Office of Rail and Road.
Note: The Public Performance Measure (PPM) is a metric that combines punctuality and reliability to represent the proportion of all scheduled trains that are 'on time', which for operators in the London and South East region means arriving at the destination no later than five minutes after the scheduled arrival time.

On London Overground, this is explained by some service frequency enhancements that were introduced in late 2019, which would have been partially obscured by severe disruptions to the Gospel Oak to Barking line in the first half of 2019/20, and

which also would not have fully come through in the annualised statistics until 2021/22, the first full year in which they were operational following the severe disruptions and service reductions caused by the pandemic in 2020/21.

For TfL Rail, the increase in train kilometres is a direct consequence of the ramp-up of services ahead of the opening of the central section of the Elizabeth line, which will be reflected in the 2022/23 annualised statistics.

However, in terms of operational performance (measured as the annual average of the ORR's Public Performance Measure, PPM) both modes saw a slight decline in 2021/22 from the high point during the pandemic in 2020/21, albeit at levels well above 2019/20 and indicative of excellent service in absolute terms.

London Trams: service provision and operational performance

On London Trams, service provision in 2021/22 almost reached the pre-pandemic level seen in 2018/19 and 2019/20 and performance (as proportion of scheduled kilometres operated) went up to the level before the pandemic (table 7.10).

Table 7.10 London Trams service provision and reliability, 2011/12-2021/22.

Year	Scheduled kilometres (millions)	Operated kilometres (millions)[1]	Scheduled services operated
2011/12	2.74	2.71	98.9%
2012/13	2.98	2.90	97.3%
2013/14	3.06	3.03	98.9%
2014/15	3.03	3.01	97.9%
2015/16	3.07	3.04	99.0%
2016/17	3.30	3.20	97.1%
2017/18	3.35	3.30	98.5%
2018/19	3.28	3.23	98.5%
2019/20	3.25	3.19	98.2%
2020/21	3.07	3.02	98.3%
2021/22	3.21	3.16	98.5%

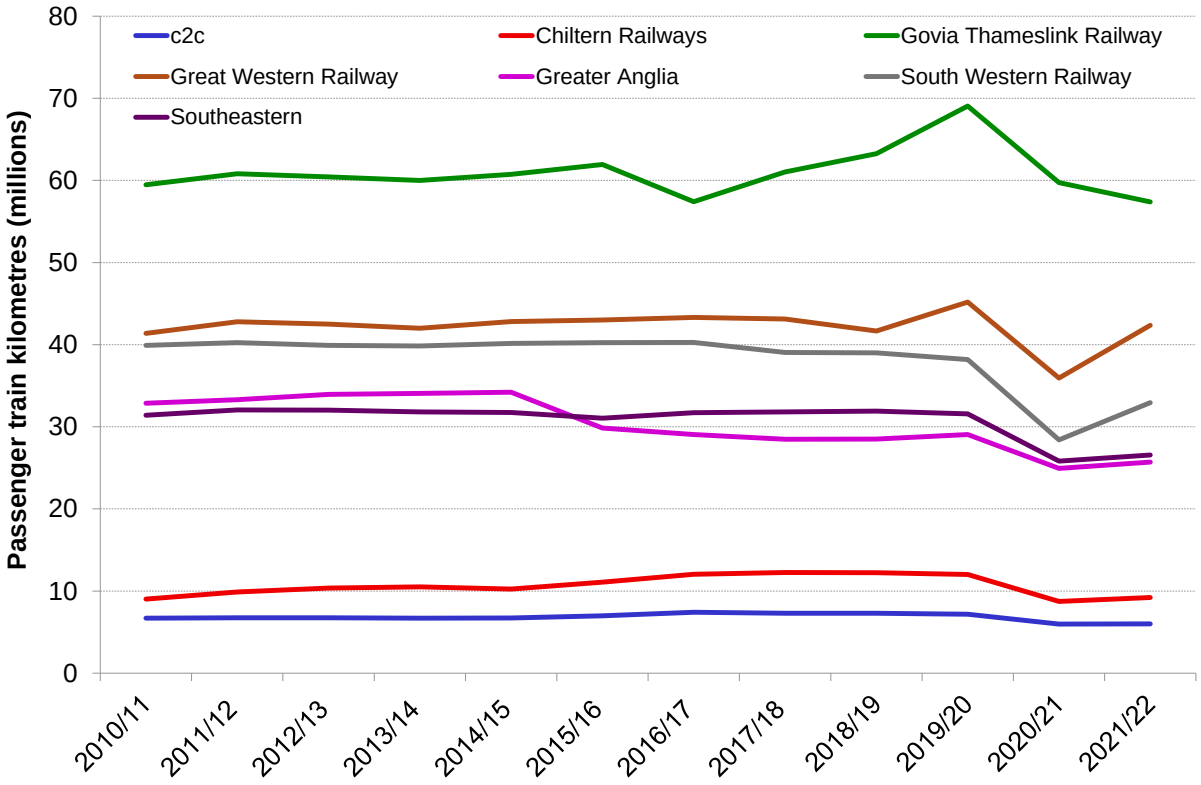
Source: London Trams.
Note: Operated kilometres exclude replacement bus services operated during periods of track repair works. Values for 2016/17 were affected by the tragic Sandilands incident.

National Rail in London: service provision and operational performance

On National Rail franchised operators in the London area (which also includes some travel outside the London boundary), service provision in 2021/22 (as passenger train kilometres) generally remained noticeably below the pre-pandemic levels, although with small improvements since 2020/21 for all but one operator (figure 7.21).

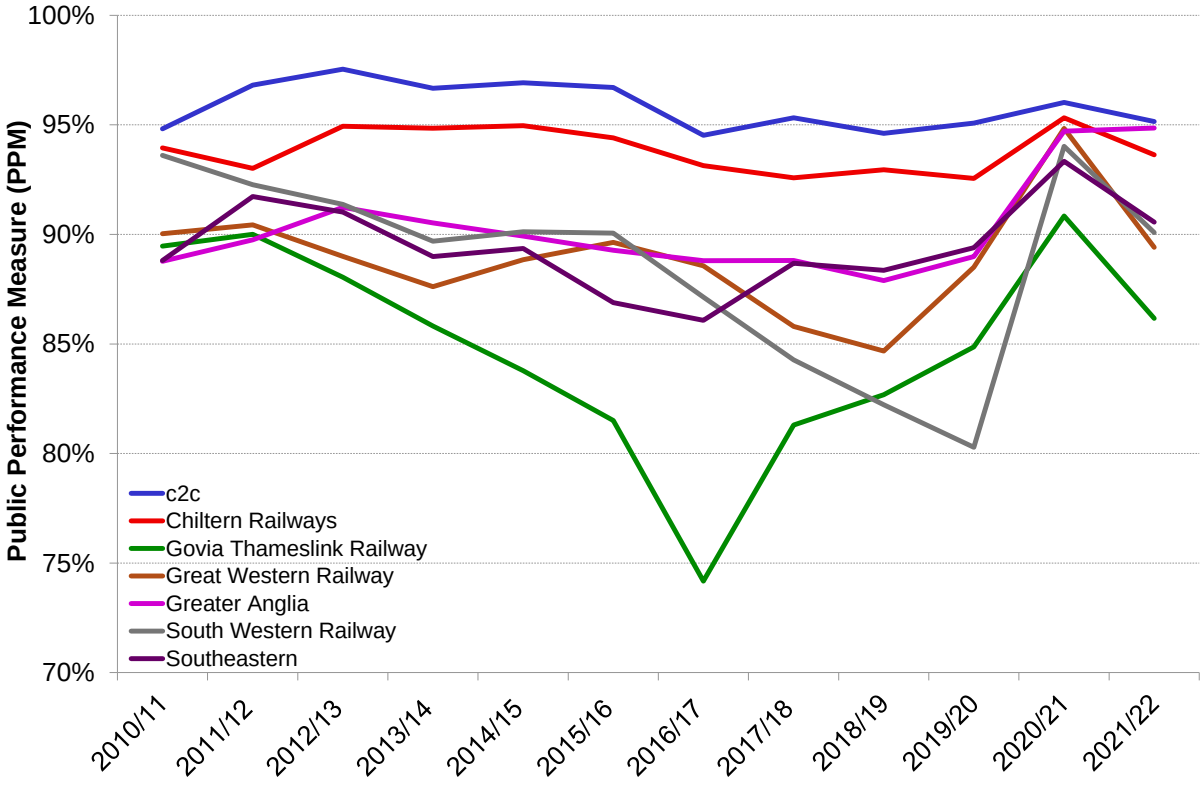
In terms of service performance (measured with the annual average of the PPM, figure 7.22), in 2021/22 most operators saw a partial if not complete loss of the net reliability gains achieved at the height of the coronavirus pandemic in 2020/21, with only one operator achieving an improvement in PPM since the previous year.

Figure 7.21 Service provision on London and South East operators, 2010/11-2021/22.



Source: Office of Rail and Road.

Figure 7.22 Performance (annual average of the Public Performance Measure) on London and South East operators, 2010/11-2021/22.



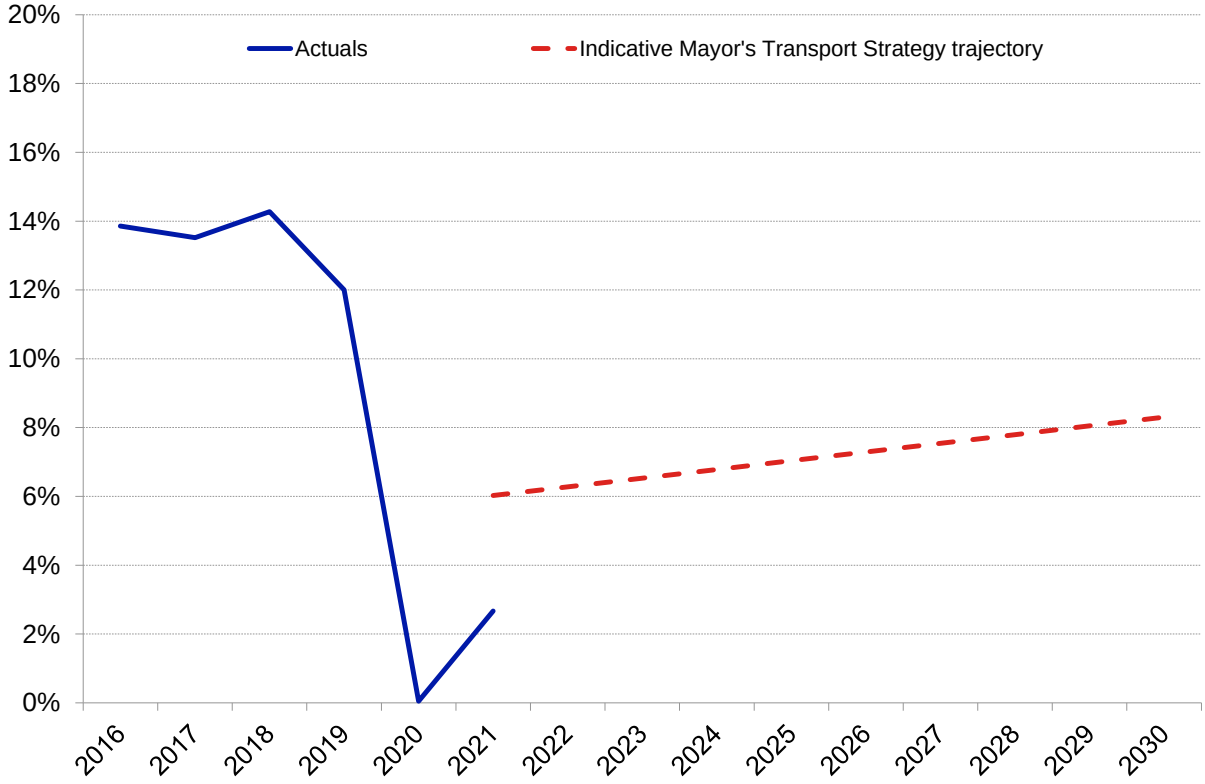
Source: Office of Rail and Road.

Utilisation and crowding on TfL's rail networks

Travel in London report 14 gave a detailed overview of occupancy levels and crowding on all TfL rail modes before the pandemic and introduced a new metric to monitor progress in this area.

Figure 7.23 provides an update of this metric in the context of the Mayor's aims ahead of a more detailed review of crowding and occupancy in a future Travel in London report. This will take place once public transport demand has settled after the pandemic and following the opening of various recently completed infrastructure projects, notably the Elizabeth line, the London Overground extension to Barking Riverside and the Northern Line Extension.

Figure 7.23 Proportion of passenger kilometres travelled on TfL rail services in standing densities above two people per square metre, 2016-2030.



Source: TfL Public Transport Service Planning.

8. Customer experience on public transport

8.1 Introduction

This chapter looks at selected aspects of the customer experience on public transport, including safety, crime, physical accessibility, customer satisfaction and Care, and public transport fares.

8.2 Customer safety

With fewer customers travelling during the coronavirus pandemic there was a corresponding fall in the number of customer and workforce injuries on the public transport network.

In 2021/22 there were 6,957 injuries of all severities across all public transport modes (table 8.1). This compares to 3,389 injuries during 2020/21, which was more severely affected by pandemic restrictions. It also compares to representative pre-pandemic values of more than 9,000 such injuries per year.

Table 8.1 Customers injured on London's public transport, 2017/18-2021/22.

Year	2017/18	2018/19	2019/20	2020/21	2021/22
Number of injuries	9,791	9,544	9,344	3,389	6,957

Source: TfL Safety, Health and Environment.

A rate-based examination suggests, however, that there may be some adverse trends emerging as we recover from the pandemic and as people return to public transport.

The customer injury rate has increased in 2021/22, up by seven per cent, compared to 2017/18. This is a worrying trend and suggests that some customer behaviours seen during the pandemic, such as not wanting to hold on to handrails, may be persisting, despite our much-publicised cleaning efforts. The upward trend could also be explained by customers returning to the network after an 18-month gap and needing to readjust to stations and routes.

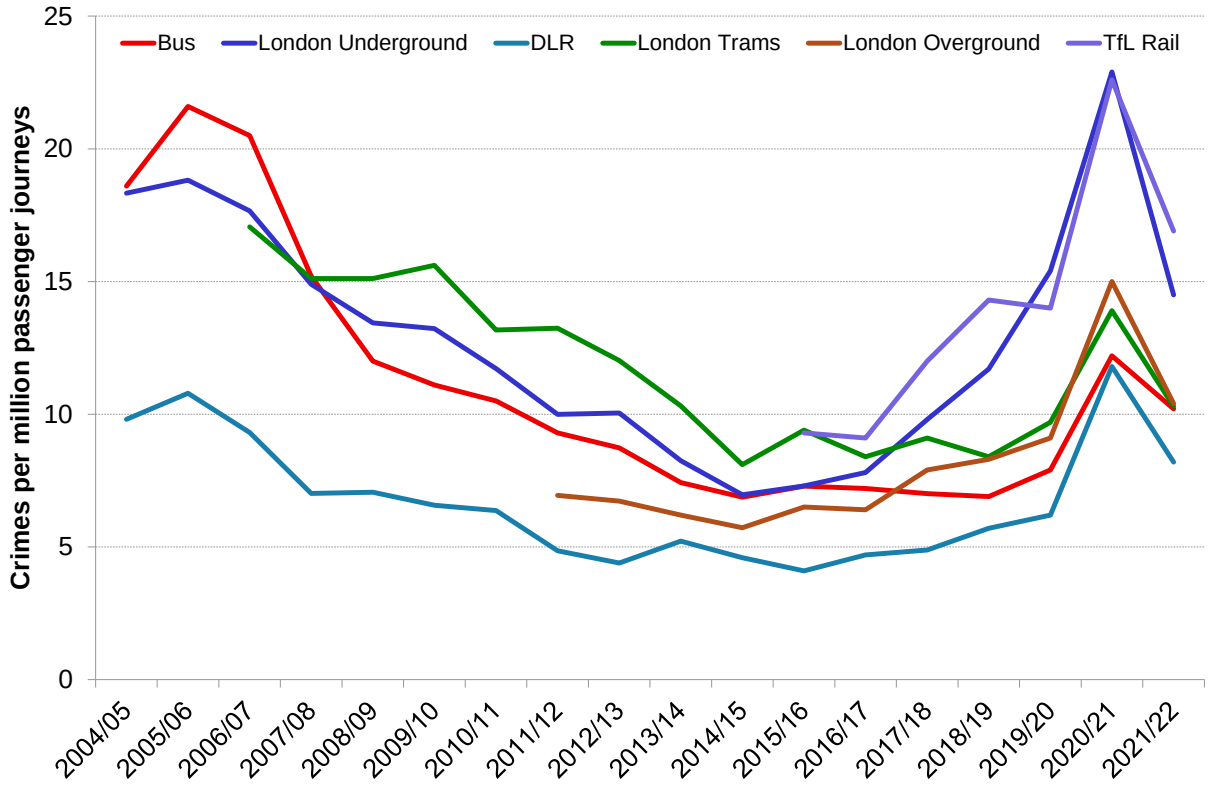
TfL will be looking at this closely over the coming year, making sure to evolve our customer marketing campaigns accordingly and to provide advice on travelling safely.

8.3 Crime and antisocial behaviour

Public transport in London continues to offer a low-crime environment and a safe way to travel. These low levels of crime have been driven by a range of initiatives undertaken by TfL in partnership with the police.

Although absolute reported crimes fell across all networks in 2020/21, the reported crime rate increased due to the dramatic fall in public transport volumes caused by the pandemic (figure 8.1).

Figure 8.1 Reported crime on TfL's public transport networks, 2004/05-2021/22.



Source: TfL Compliance Policing Operations Security.

In 2021/22 the crime rate decreased on all modes compared to 2020/21 as passengers returned to the network. Although the absolute number of reported crimes increased, the proportional increase in passenger volumes on public transport as demand returned from the pandemic was greater.

8.4 Physical accessibility of the public transport networks

Improving the accessibility of London's public transport services is fundamental to supporting and enhancing the quality of life of Londoners. Making travel more accessible and inclusive for Londoners is one of our top priorities.

By working to deliver an equitable, accessible and inclusive public transport system that works for everyone, TfL can make people's lives easier and increase the appeal of sustainable public transport over the use of private cars.

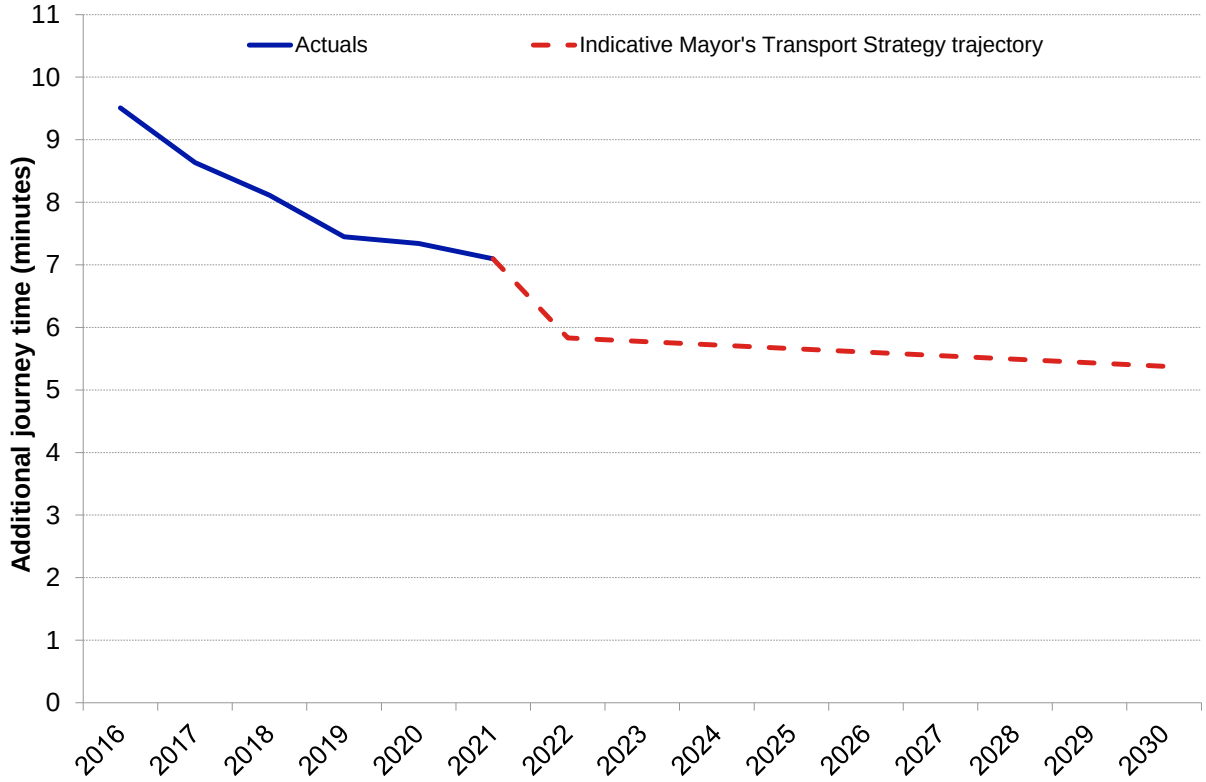
TfL measures progress against this aim by tracking the relative additional journey time that is incurred using only the step-free network against the time required if the whole network was used, for the average of all possible journey combinations in London. Figure 8.2 shows progress on this metric over recent years.

In 2021/22, Nine Elms and Battersea Power Station opened with step-free access as part of the Northern Line Extension. Other London Underground stations that were

made step free were Debden, Ealing Broadway, Harrow-on-the-Hill, Ickenham, Osterley, Sudbury Hill, Whitechapel and Wimbledon Park.

The opening of the Elizabeth line further provides 41 step-free stations. While some of these have been delivered over recent years on National Rail networks, the opening of the central section has made the heart of the West End more accessible and inclusive for Londoners than ever before.

Figure 8.2 Additional journey time using the step-free network, 2016-2030.



Source: TfL City Planning.

All these recent improvements will translate into a reduction of about 32 per cent in the additional journey time using the step-free network, from 9.5 minutes in 2016/17 to 6.4 minutes in 2022/23. This is in addition to the transformational journey time savings brought about by the Elizabeth line (see chapter 9 of this report).

Table 8.2 summarises the step-free access position on TfL's public transport networks as of autumn 2022. Note that the entirety of the bus network is assumed to be step free because all London buses have ramps and other step-free features.

Table 8.2 Step-free stations on TfL's public transport networks, autumn 2022.

Mode/network	Step-free stations	Total stations	Proportion of step-free stations
London Underground	92	272	34%
DLR	45	45	100%
London Overground	62	112	55%
Elizabeth line	41	41	100%
London Trams	39	39	100%

Source: TfL City Planning.
Note: Stations that are served by more than one mode are counted for each mode separately.

8.5 Public transport customer satisfaction and Care

Care and customer satisfaction are our primary measures for understanding the quality of the customer experience that TfL delivers, from a customer perspective. They are complementary elements in determining how TfL is working for its customers, providing a rounded picture of our performance.

Definition of 'Care'

'TfL cares about its customers' is the measure used to understand whether TfL is meeting expectations and making Every Journey Matter for our customers.

Care measures Londoners' overall perceptions of TfL and is the best reflection of how it meets expectations in every interaction with customers (for example all journeys, interactions with the Contact Centre and communications such as email updates), not just the last journey.

TfL tracks Care through an online survey that asks a representative sample of Londoners about their opinions of TfL every period. A continuing focus on Care helps TfL understand, in the short term, how TfL works for our customers, and in the longer term, how to encourage greater use of active, efficient and sustainable modes.

The key influences on the Care score

Understanding the key influencers (or drivers) of the Care score allows us to prioritise actions to improve the customer experience. These are:

- TfL is an organisation I can trust
- TfL is communicating openly and honestly
- TfL is supporting customers when things go wrong

Being an organisation customers trust is the greatest driver of Care. Our performance in this area is already strong, but TfL continues to aim to deliver a consistently good customer experience as it is known that this builds customer trust. In other words, when customers trust us, they will travel with us.

Supporting customers when things go wrong is a key priority area to improving Care. When things go wrong on the network, our response and how well supported customers feel is crucial. Key aspects of demonstrating support include providing accurate live information to customers, empathising with their needs and rectifying mistakes.

Supporting customers also means taking preventative measures, such as providing advance information about forthcoming engineering works or about how customers can receive best value for money, for example through fare capping.

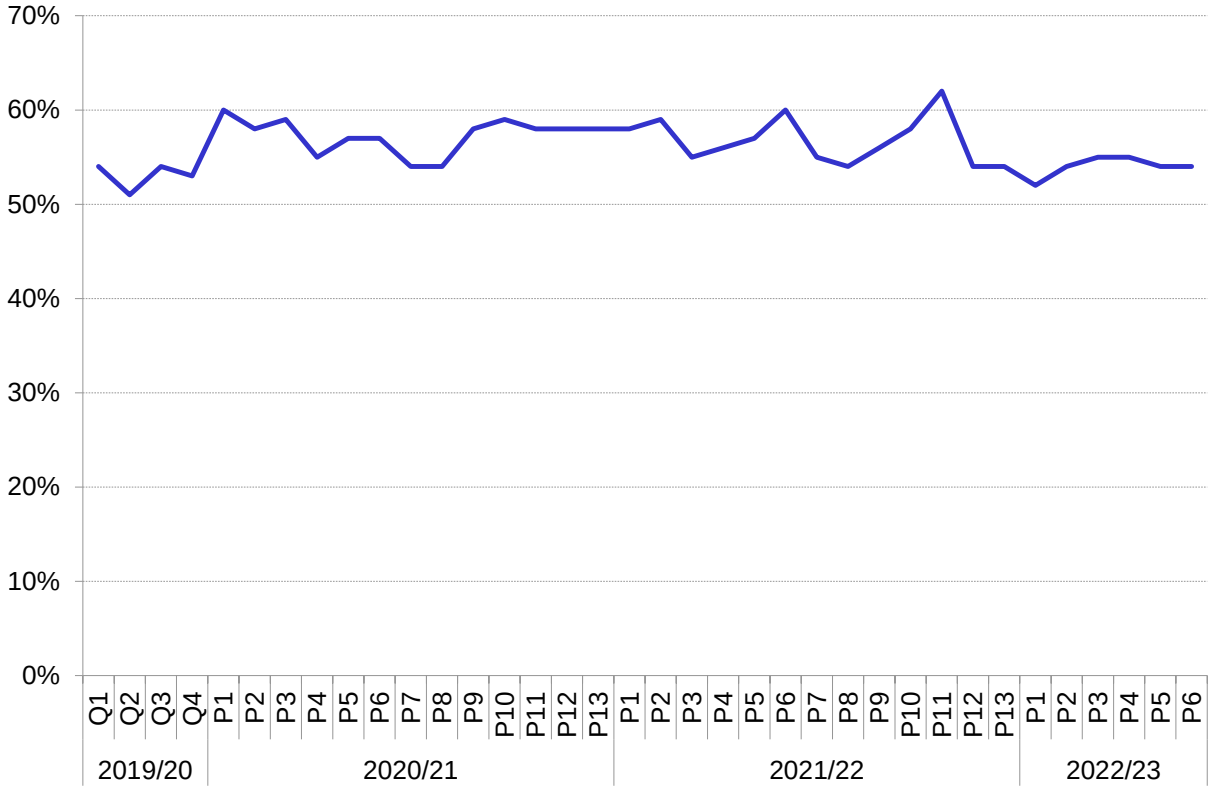
Trend in Care scores

Historically, the Care metric showed strong improvement from the beginning of 2012 until mid-2014 (from 35 to 50 per cent). This is thought to reflect a focus on customer service improvements such as the introduction of contactless payments.

From mid-2014 until late 2018 the Care metric stabilised at a level just below 50 per cent and increased gradually through 2019/20 reaching a high point of 60 per cent in Period 1 of 2020/21 at the start of the pandemic.

Figure 8.3 shows the trend in the Care score in recent years, remaining high between 50 and 60 per cent.

Figure 8.3 Agreement with 'TfL cares about its customers', 2019/20-2022/23.



Source: TfL Customer Insight, Strategy & Experience.

Throughout 2020/21 and 2021/22, the Care metric remained resilient to the challenges of the pandemic and slight dips in scores have generally been at points when there was increased pressure on the network as customers returned for the first time.

The pandemic-affected 2020/21 financial year also saw annual highs for trust, open and honest communication, supporting customers when things go wrong, and friendly and helpful staff.

The trend for 2022/23 so far suggests a stabilisation of the Care score at around 54 to 55 per cent.

8.6 Public transport fares

The average yield per passenger journey for all modes was £1.20 in 2021/22, an increase of 3.2 per cent compared with 2017/18. The average fare paid on public transport differs across all modes.

Table 8.3 shows the average yield per passenger journey each year, adjusted for inflation.

Table 8.3 Average yield per journey, by mode, 2017/18-2021/22.

Year	London Underground	Bus	London Overground	TfL Rail	DLR	Tram	Total
2017/18	£1.98	£0.65	£1.18	£1.79	£1.41	£0.83	£1.16
2018/19	£2.01	£0.66	£1.23	£1.78	£1.41	£0.82	£1.19
2019/20	£2.04	£0.68	£1.22	£1.95	£1.44	£0.84	£1.22
2020/21	£2.19	£0.82	£1.24	£2.03	£1.37	£1.00	£1.19
2021/22	£2.02	£0.74	£1.37	£2.32	£1.36	£0.88	£1.20

Source: TfL Finance.

London Underground has the highest yield, at just more than £2.00 per journey. This has increased slightly from £1.98 in 2017/18 to £2.02 in 2021/22, although the latest two years of data are affected by changes in travel patterns due to the pandemic.

In contrast, the lowest yield is on buses, at 74 pence per journey. The impact of concessionary fares means that the income per journey is lower than the average fare per mode.

Section 4: Supporting London's growth

9. The Elizabeth line

9.1 Introduction

On 24 May 2022 a historic milestone in London's transport was reached when the central section of the new Elizabeth line successfully opened to services between Paddington and Abbey Wood through the heart of central London and the London Docklands.

This opening marked the pivotal step on what has been an incremental process of service enhancement (formerly under the TfL Rail brand with services between Reading/Heathrow airport and Paddington and between Shenfield and Liverpool Street) which will culminate in May 2023 when direct services are provided to and from all destinations on the eastern and western branches of the line and full levels of service operate across the whole railway.

This chapter provides initial insights on the transport impacts of the Elizabeth line since the opening of the central section between Paddington and Abbey Wood, reflecting about five months of operation between May and October 2022. As such, it does not consider the impacts of more recent milestones like the opening of Bond Street station on 24 October 2022 or the introduction of direct services between Reading/Heathrow airport and Abbey Wood and between Shenfield and Paddington on 6 November 2022.

The analysis in this chapter draws from TfL's day-to-day monitoring tools for the Elizabeth line and further considers some of the emerging secondary impacts on other parts of the transport network. However, it is by necessity limited in scope since the full impacts of this transformational project will take years to materialise as subsequent milestones are reached, travel patterns settle and the wider impacts on homes, jobs, and people's lives are fully realised.

For this reason, over the coming years TfL and the Department for Transport (DfT), as co-sponsors of the Crossrail Project which gave rise to the Elizabeth line, will be jointly undertaking a full impact assessment and evaluation looking not only at the transport impacts of the new railway but also more widely at how it has contributed to London's growth and prosperity, the Mayor's aims for transport in the Capital, and the changes to the local areas around the stations served by the new line.

For more details about this longer-term monitoring and evaluation strategy see the Elizabeth line benefits framework page on TfL's website.

9.2 The Elizabeth line: London's new railway

Conceived in its current form in 2001 and given Parliamentary Assent in 2008, the Elizabeth line (formerly Crossrail Project) draws together existing National Rail services to the west and east of London via a new tunnel through central London and the London Docklands. Details of the history and rationale for the project are provided on the Elizabeth line pages on TfL's website.

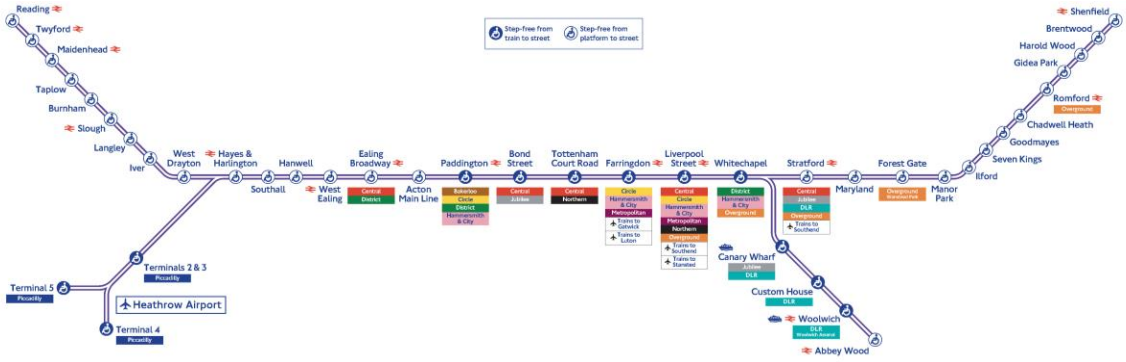
Following a ceremonial launch on 17 May 2022, where Queen Elizabeth II officially inaugurated the railway that bears her name (see figure 9.1), the central section of the Elizabeth line started passenger service on 24 May 2022.

Figure 9.1 Photographs from the Elizabeth line's launch event, 17 May 2022.

Source: TfL Press Office.
Left: Queen Elizabeth II with His Royal Highness the Earl of Wessex and Andy Byford, former TfL Commissioner.
Right: Mayor of London Sadiq Khan with former TfL Commissioner Andy Byford.

When fully operational in May 2023 the central section of the Elizabeth line will be joined, in the west, by existing services from Reading and Heathrow airport to London Paddington and, in the east, by services between Shenfield and Liverpool Street, providing direct services to and from all destinations on all branches (see figure 9.2) with maximum weekday peak service frequencies through central London of 24 trains per hour (one train every 2.5 minutes).

Figure 9.2 The Elizabeth line.



Source: TfL.

The Elizabeth line, however, is much more than a new, high-frequency train service. The new railway, which is the largest major expansion to TfL's rail networks in a generation, is expected to have a transformational impact on the Capital and, once fully operational, will add about 10 per cent of capacity to central London's rail network, the largest single increase in the Capital's transport capacity in more than 70 years.

The new Elizabeth line is expected to increase connectivity, provide new journey options and support wider regeneration in many areas, creating jobs, business

opportunities and a huge economic boost for the country. In fact, some of this potential had already been realised ahead of the official opening. For example, a total of 54,725 homes were delivered within one kilometre of future Elizabeth line stations between 2008 and 2021.

9.3 Summary of key transport impacts so far

The opening of the central section of the Elizabeth line between Paddington and Abbey Wood in May 2022 reflected a key interim stage in the programme to fully implement the new railway and has already started to change the way people travel in and across central London, providing many new connections to existing services along its route, such as the Thameslink network at Farringdon and other National Rail services from the various termini along the route. The full transformational scope of the new railway, however, has yet to be completely realised.

During this intermediate stage, a service operated on weekdays and Saturdays between the hours of 06:30 and 23:00 with no service provided on Sundays and no stopping at Bond Street station, which opened on 24 October 2022.

At that point, passengers wishing to make journeys beyond Paddington or Liverpool Street would have had to change trains at these termini, since the first stage of services running through central London only started on 6 November 2022.

In this context, the following are the key impacts of the new railway so far, reflecting about five months of operation:

- With the opening of the central section of the Elizabeth line, nine new step-free **stations** from train to street have come into service between Paddington and Woolwich, with three more available in Heathrow airport and the remaining 29 (some of which existed already) being step free from platform to street.
- The initial **service** was 12 trains per hour in both directions between Paddington and Abbey Wood. Since each train has a total capacity of 1,500 passengers, this translated into a maximum throughput of 18,000 passengers per hour.
- In terms of **patronage**, on an average mid-week day (Tuesday to Thursday) around 230,000 passengers used the central section of the line per day, which is equivalent to about five million passengers per four-week financial period, higher than forecast at this stage of operation.
- The **occupancy** of trains is in line with expectations in terms of volumes and locations. In general, there is sufficient capacity for comfortable travel even at the busiest periods (and room for growth in the future), while instances of moderate crowding (at no more than two standing passengers per square metre, well below other London Underground lines), have only been observed in the morning peak between Whitechapel and Liverpool Street.
- Improved **connectivity** is one of the key benefits of the Elizabeth line and passengers are already experiencing it on their journeys across London. The new line connects many existing services and several new direct journeys are also possible now, offering in some cases very substantial time savings. For example, the station-to-station time between Paddington and Tottenham Court Road with the Elizabeth line is now as little as 14 minutes, seven minutes less than the 21 minutes it takes using other London Underground lines. More impressively, the time it takes to travel between Abbey Wood and Tottenham Court Road with the

Elizabeth line is half than what it takes using other rail services, from 60 to as little as 30 minutes.

- Finally, the **operational performance** of the Elizabeth line has been very good in this first interim stage, offering excellent reliability with a 94.6 per cent score for the Public Performance Measure between 24 July and 20 August 2022 and being the industry's top performer for three periods.

9.4 Overall demand and emerging travel patterns

In the first five months of operation (from May to October 2022) the Elizabeth line saw around 60 million journeys, with about half of these (30 million) on the central section between Paddington and Abbey Wood. This corresponded to about 450,000 and 230,000 journeys per day, respectively, on an average mid-week day (Tuesday to Thursday), which is when demand is highest, as is the case with most other London Underground lines since the coronavirus pandemic.

This level of demand is higher than the expectations set out in our 2022/23 Budget for this interim stage of operation. The difference reflects assumptions about the pandemic, the demand build-up rate, the postponement of Sunday services and the opening of Bond Street station, and changes to levels of service in response to the pandemic recovery (especially on the National Rail network). Secondary factors that explain this trend include industrial action across the wider rail network, extreme hot weather instances during the summer of 2022 and various ceremonial events related to Queen Elizabeth II's Diamond Jubilee celebrations in June 2022 and her State Funeral arrangements in September 2022.

After the initial opening of the central section in May 2022, passenger demand reduced slightly over the summer holiday period, as was expected, but then saw a step increase upon the return to school in September, where it reached the highest number of journeys per period thus far: 270,000 passengers on an average mid-week day (with a maximum of 290,000) in Period 7 compared to around 230,000 in the first period immediately after opening.

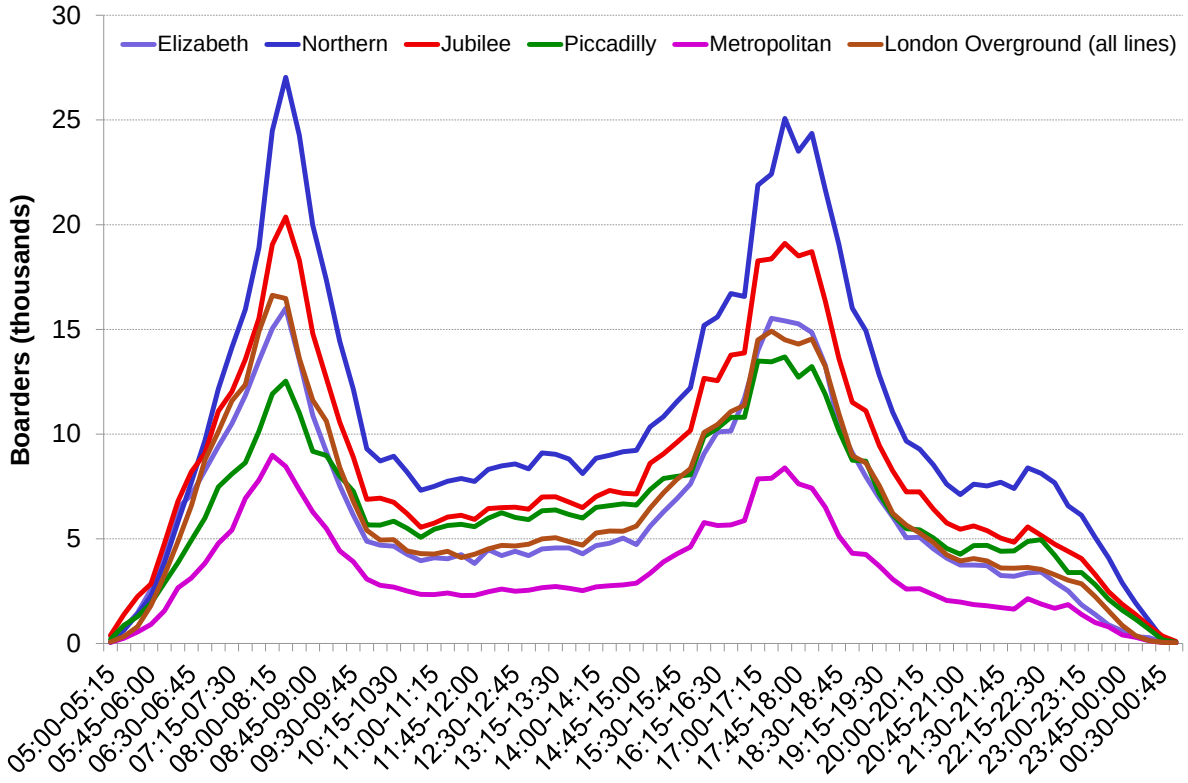
Across the entire line, 55 per cent of journeys take place during the morning and evening peaks (07:00-10:00 and 16:00-19:00, respectively). This is slightly higher than what is observed on other London Underground lines and more similar to the patterns observed on the London Overground, which reflects the geographical reach of the new railway and its attractiveness to commuters.

Taking the central section only, the proportion of journeys during the peaks is just less than 50 per cent, which is more aligned with other London Underground lines and also reflects the role of the central section as an urban connector.

Figure 9.3 shows the profile of demand throughout the day on an average mid-week day, comparing it with other London Underground and London Overground lines.

Although this reflects the current interim stage of operation, the Elizabeth line is clearly already a key part of the London rail network and, by creating extra capacity, is contributing to the relief of crowding on other lines.

Figure 9.3 Boardings on the central section of the Elizabeth line and on selected London Underground lines and the London Overground by time of day, Tuesday to Thursday average, week commencing 22 Sep 2022.



Source: TfL Public Transport Service Planning.

9.5 Train occupancy

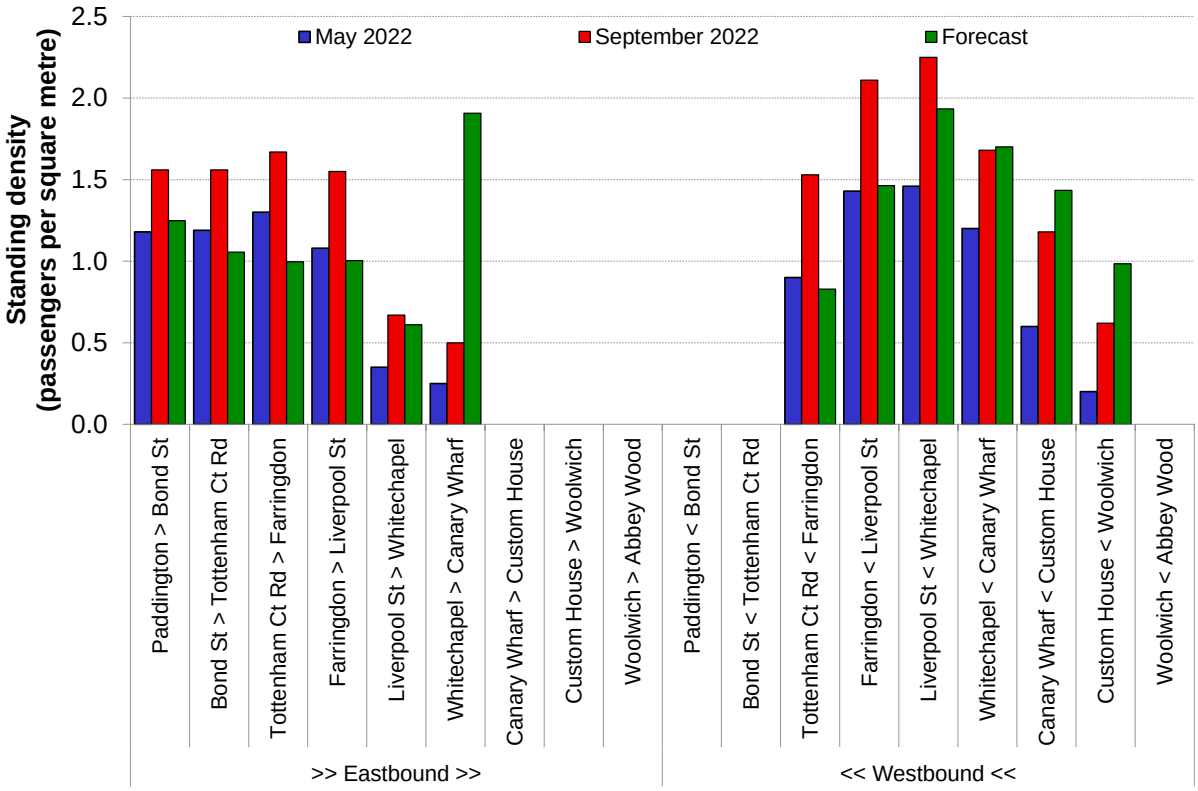
The ideal outcome for the new Elizabeth line would be a well-used but not overcrowded railway. Therefore, an important measure of success is the average number of people on board each train; and more specifically the average standing density (number of standing passengers per square metre), which is a good proxy for the assessment of train occupancy and crowding (the latter typically considered when this density exceeds two passengers per square metre).

This flexible metric can be calculated at different times of the day and by location (station-to-station link), and thus allows the identification of where and when crowding problems may occur.

As an illustration, figure 9.4 shows average passenger densities on the central section of the Elizabeth line during the busiest hour of the morning peak at two different points in time since the opening, comparing them to the modelled forecast for this initial phase.

In the eastbound direction, train occupancy as of September 2022 was slightly above the modelled forecast between Paddington and Liverpool Street. This suggests that passengers have been quick to respond to the new Elizabeth line, likely due to the ability to board empty trains at Paddington, where the eastbound services in the central section started in this initial phase of opening.

Figure 9.4 Standing densities on the central section of the Elizabeth line, busiest hour in the morning peak, May and Sep 2022 vs modelled forecast.



Source: TfL Public Transport Service Planning.

Passengers who might have wanted to travel to Bond Street (not in operation at the time of the data collection), appear to be travelling one stop further to Tottenham Court Road, thus pushing the high densities further eastwards.

On the other hand, trains were less busy than forecast between Whitechapel and Canary Wharf. This is likely to be due to Bond Street not being open at that time (thus preventing interchanges with the Jubilee line) and to the continuing impact of the pandemic on commuting trips, with lower frequencies of travel to the Isle of Dogs employment area.

Beyond Canary Wharf, morning peak services are running with available seats (standing density zero), which is expected.

In the westbound direction, the general pattern observed is in line with the forecast, with passenger loads building up until Liverpool Street before dropping off at this key interchange, while occupancy in central London is exceeding expectations.

Changes to these initial results are expected after the opening of Bond Street station in late October 2022 and the new service patterns from November 2022.

9.6 Connectivity and journey times

Reducing travel times is a key benefit of many transport projects since it allows passengers to spend their time more productively by making this time available for other activities. This is particularly true for the Elizabeth line, where the estimated

journey time savings and crowding relief (which is also reflected in generalised journey time calculations) are the largest component of passenger and non-passenger benefits in its business case.

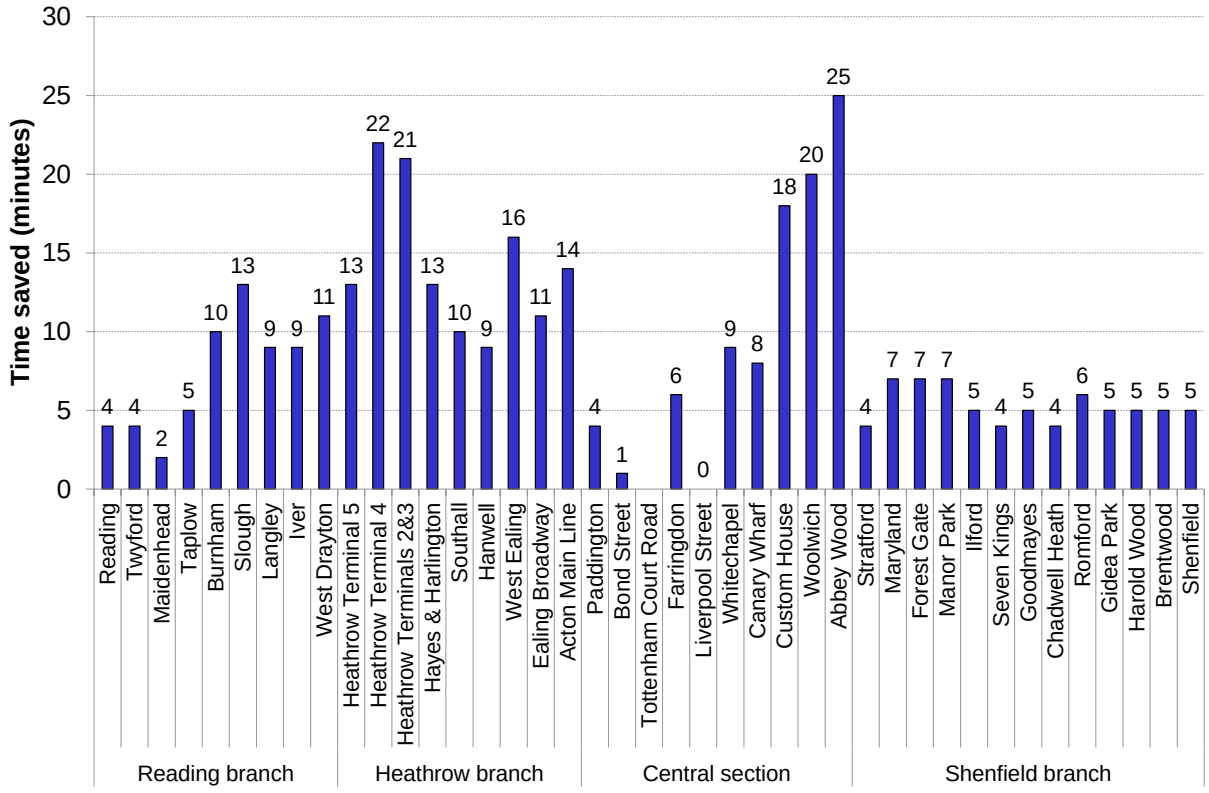
A preferred way of measuring journey time improvements is through 'generalised journey time', which takes into account interchange times, waiting times and the impact of crowding and fares (through appropriate weighting), thus providing a rounded indication of the overall customer experience.

However, at this early stage this method is not available for the Elizabeth line. Once the line is fully open, subsequent studies will address this and allow direct comparisons against the generalised journey time forecasts.

Nonetheless, an unweighted version of this generalised journey time is currently available, which assumes a random station arrival, includes waiting, in-vehicle time (but not crowding) and any walk time at interchanges, but does not include the impact of fares.

Comparisons using this metric give a good sense of the transformational scale of journey time benefits already enjoyed by Elizabeth line passengers. As an illustration, figure 9.5 shows the impact on unweighted generalised journey times between Tottenham Court Road and the other Elizabeth line stations during peak service, before and after the opening of the Elizabeth line central section.

Figure 9.5 Journey time savings on the Elizabeth line to and from Tottenham Court Road since the opening of the central section, during peak service.



Source: TfL Public Transport Service Planning.
Note: Where the journey requires an interchange the walk time is captured.

The key features of this graph are:

- The Elizabeth line almost halves the time it takes to travel between stations in southeast London and central London. For example, passengers can now travel between Abbey Wood and Farringdon in as little as 20 minutes, where before it would have taken 39 minutes.
- Journeys to and from Paddington have also particularly benefited from the Elizabeth line. Previously, its peripheral location made this important gateway to west London, Heathrow and Reading rather slow to access, but with the Elizabeth line there are now direct and fast connections to many other parts of the city.
- Other origin and destination pairs (for example Tottenham Court Road to Liverpool Street or Stratford) have not seen major reductions in journey time, but they have both seen small demand increases. This is probably because getting to the Elizabeth line platforms and waiting for the trains takes slightly more time than doing so with the Central line, which also provides a direct connection. This, however, may change after the opening of direct services (without the need to interchange at Liverpool Street) in November 2022 and as the service frequency increases in subsequent phases over the coming months.
- There have been no journey time savings outside the central section since these services were already available to passengers as TfL Rail. Again, this may change once the bulk of the central section is joined up with the eastern and western branches from November 2022.
- Finally, the new connections have unlocked latent demand between origin and destination pairs that were not served efficiently before. For example, Tottenham Court Road to Farringdon had very low demand before the Elizabeth line, with passengers using mostly nearby stations such as Chancery Lane or other modes such as bus route 55 to avoid unattractive interchanges; but now it is a busy origin and destination pair, following the halving of the journey times.

Focus on: transforming journey times at Abbey Wood

Of particular note is the transformational impact that the Elizabeth line is having on Abbey Wood and its surrounding area, where the significant reduction in journey times to central London, the improved connections to local buses and taxis on Harrow Manorway, and the new developments (including a new civic space for the local community) are improving the lives of local residents.

With the improvements in connectivity, large areas of London are now reachable from Abbey Wood within reasonable times, which was not the case before the Elizabeth line. For example, it is estimated that around 1.4 million more jobs in London and the South East (up from 200,000) are now accessible within 60 minutes of Abbey Wood since the opening of the central section. This has huge implications for an area that typically ranks highly on deprivation indices.

9.7 Trip generation and abstraction

By providing improved connectivity the Elizabeth line is expected to generate new trips that would not otherwise have been made, thus contributing to the growth and economic success of London.

But it is also expected that the Elizabeth line will attract trips formerly made by other means. In some cases, these trips will have previously been made by 'unsustainable' modes like cars, vans or motorcycles, thus contributing to the Mayor's overall aim for 80 per cent of journeys in London to be made by active, efficient and sustainable modes by 2041. However, most abstracted trips will come from parallel public transport services (both buses and rail) where capacity will be freed up and, in some cases, backfilled with new (supressed) demand.

Understanding how many and what kind of new trips are made on the Elizabeth line (trip generation) and how many and which are displaced from other services (trip abstraction) will be a key element of the longer-term evaluation of the Elizabeth line, since new journey opportunities and extra and freed-up capacity (particularly in central London) are key impacts of the Elizabeth line, and their careful monitoring will be crucial to understand and maximise the benefits from the scheme.

In the future, this assessment may also present opportunities for cost savings through the regular review of the transport network and subsequent adjustments to match service provision to the new aggregate travel patterns.

At this stage it is only possible to give some early estimates of trip generation and abstraction on the Elizabeth line. This initial assessment is necessarily provisional due to the need to disaggregate the impacts of the phased opening, the time needed for demand patterns to settle (itself exacerbated by the phased opening) and the need to normalise for background demand factors (such as the coronavirus pandemic recovery). TfL and the DfT are planning a more comprehensive evaluation over the next two years as part of the first evaluation study, which will focus on the transport network impacts.

In the meantime, figure 9.6 provides an estimated overall balance of passenger kilometres made on the central section, comparing the results from a recent financial period with the forecasts.

These estimates are calculated looking at each pair of stations, the possible routes between them, and considering whether people may have switched to the Elizabeth line for these journeys. Grouping these pairs by how much they are impacted by the Elizabeth line it is then possible to estimate the proportion of journeys that have switched, how many are new and the level of background growth.

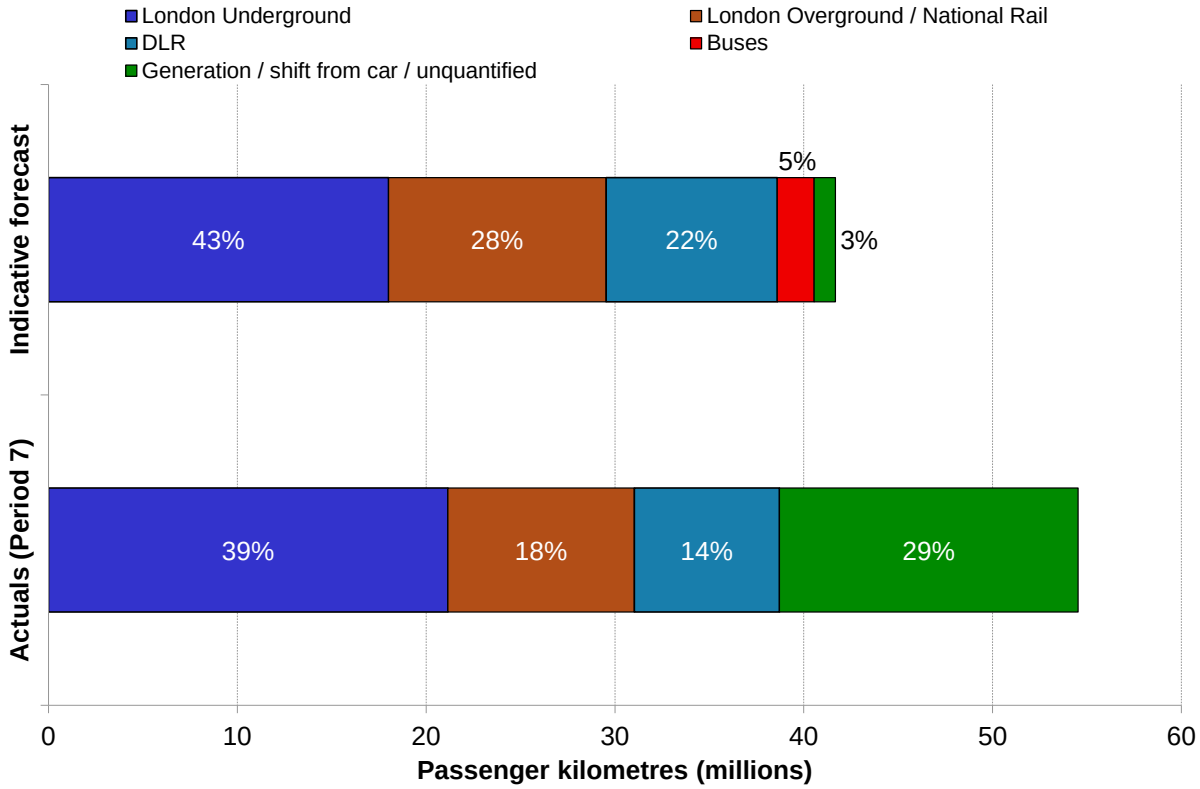
This is expressed in terms of passenger kilometres (as opposed to passenger journeys) because it is a better measure of travel volume that takes into account the distance travelled and is therefore more closely aligned to the revenue generated or abstracted.

Based on the pre-pandemic forecasts:

- The largest source of demand for the Elizabeth line (43 per cent of all passenger kilometres) was expected to be the London Underground. Passengers were expected to switch from most lines, but particularly from the Jubilee and Central.
- Passenger kilometres on London Overground and National Rail services (mainly from Southeastern) were expected to contribute to around 28 per cent of the Elizabeth line travel volume.
- Significant abstraction was also forecast from the DLR, with up to 22 per cent of total passenger kilometres.

- The remaining, residual element of abstraction was expected to be a combination of mode shift from buses (five per cent of total passenger kilometres) and other, non-public transport services (three per cent of total passenger kilometres).

Figure 9.6 Sources of patronage (passenger kilometres) on the central section of the Elizabeth line, Period 7 vs forecast.



Source: TfL Public Transport Service Planning.

The latest results (from Period 7) suggest that:

- About 39 per cent of observed Elizabeth line passenger kilometres have come from London Underground lines. Although this proportion is lower than expected, the fact that total passenger kilometres are higher than forecast means that the absolute amount of transfer from London Underground is also higher than forecast.
- An estimated 18 per cent of passenger kilometres would have transferred from London Overground and National Rail services, but this figure requires further analysis and validation.
- Around 14 per cent of Elizabeth line passenger kilometres have originated from the DLR. In absolute terms this is broadly as expected, but not so as a proportion, which is likely to reflect very strong recent demand on the DLR.
- Finally, the remaining 29 per cent of passenger kilometres is an unexplained element, which would be a combination of: demand that did not exist before (that is, trip generation, including from an observed increase in demand on the bus network); mode shift from other non-public transport modes; demand whose previous source cannot be allocated; and possibly stronger coronavirus pandemic recovery for origin and destination pairs served by the Elizabeth line.

In addition to these overall trends, it is also worth noting that there have been noticeable increases in station usage at several central London stations such as Farringdon (up to 30,000 more entries and exits per day), Liverpool Street (up to 50,000 more entries and exits per day) or Tottenham Court Road (up to 55,000 extra daily entries and exits). Importantly, these increases, on the whole, do not seem to have been offset by reductions on buses or at nearby rail stations.

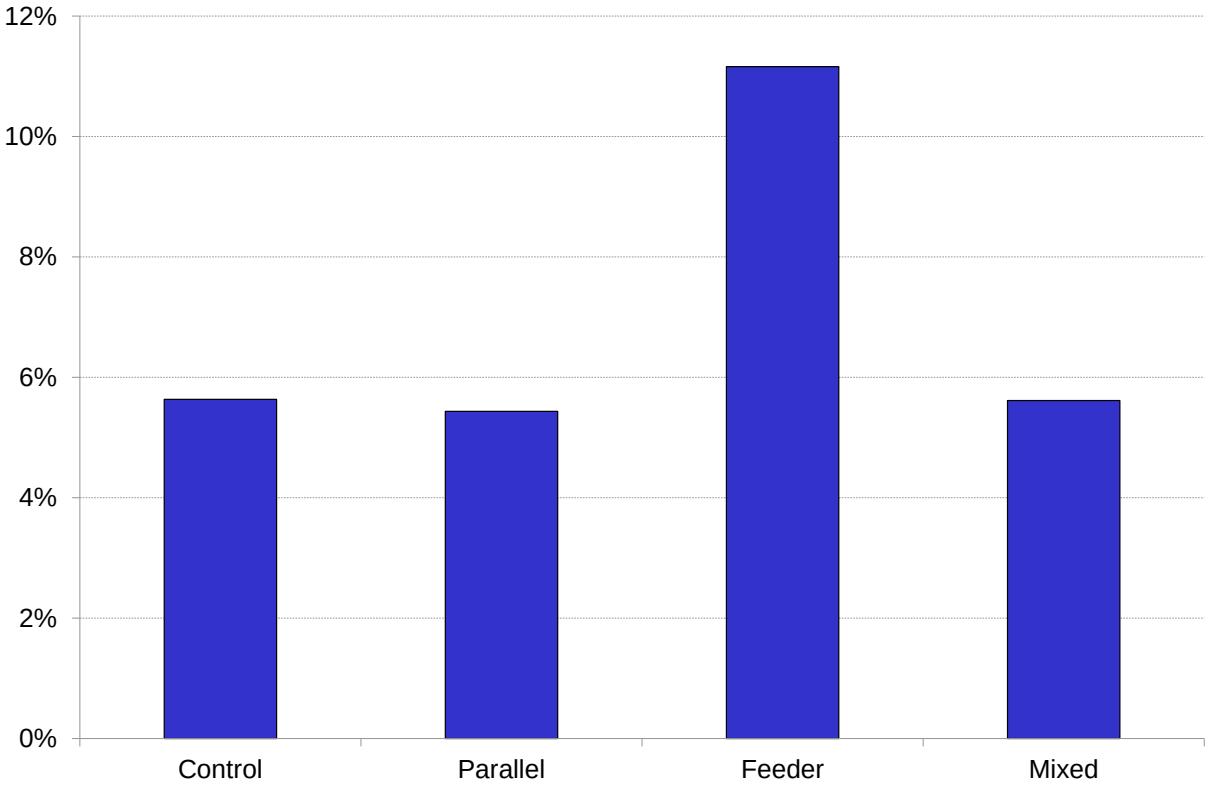
Focus on: early impacts on the bus network

Of particular interest is the impact that the Elizabeth line is having on bus patronage.

It is worth highlighting from the outset that estimating trip generation and abstraction on buses during this initial phase of the Elizabeth line is quite challenging due to the simultaneous presence of several other confounding factors such as bus service changes (like frequency reductions, curtailments and route extensions), changes in bus network performance, and wider impacts from the pandemic recovery.

However, a methodology has been developed which provides some indicative results. This methodology looks at four different subsets of bus routes classified according to their relationship to the Elizabeth line into parallel routes, feeder routes, mixed routes where the distinction is not so clear, and a control group of routes considered largely unaffected by it. The results are shown in figure 9.7.

Figure 9.7 Change in bus demand by route type, Tuesday to Thursday average, week commencing 27 Sep 2022 vs week commencing 17 May 2022.



Source: TfL Public Transport Service Planning.

This initial analysis shows that demand growth between May and September 2022 on bus routes feeding into the Elizabeth line was notably higher than on the routes in the control group. The difference is equivalent to a net increase of around 7,100 bus

passengers per average weekday, which may be interpreted as the Elizabeth line-related bus demand generation.

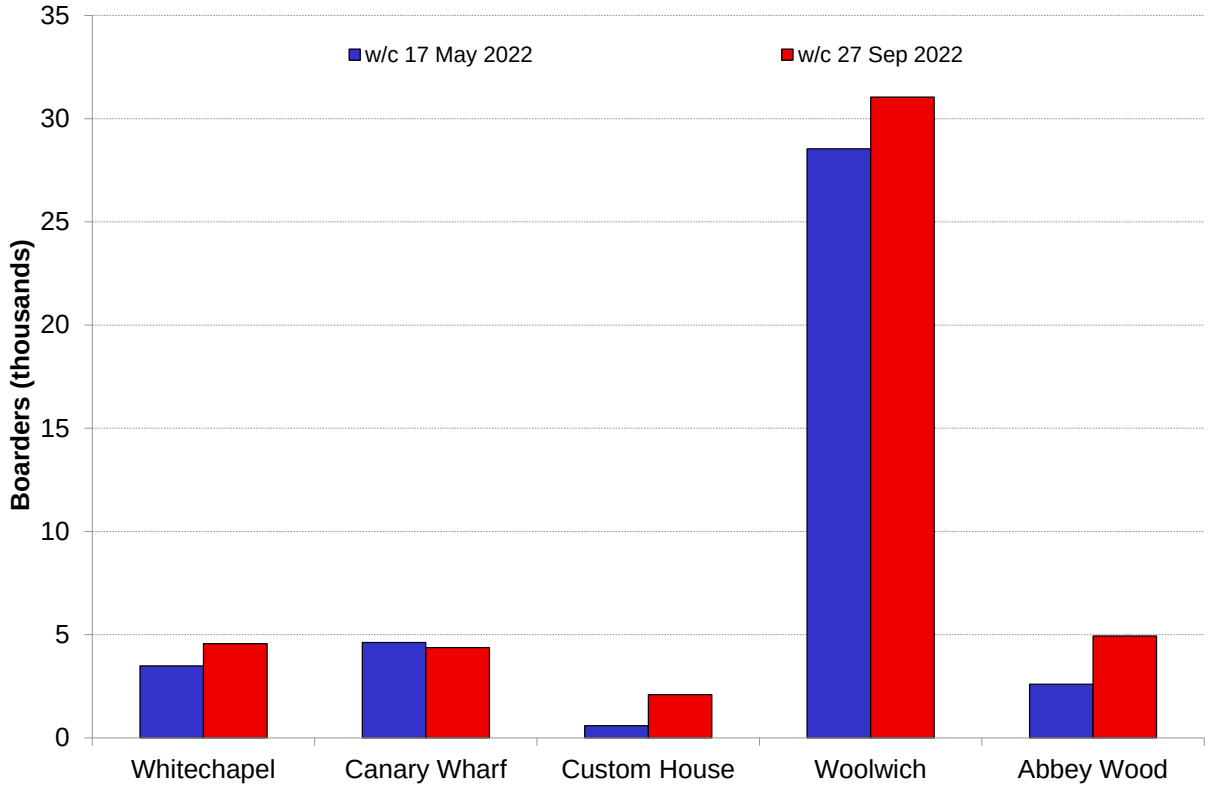
On the other hand, demand growth on bus routes running parallel with the Elizabeth line over the same period was only marginally lower than for the control group routes. This difference, equivalent to a reduction of around 500 bus passengers per average weekday, indicates the potential Elizabeth line-related bus demand abstraction.

Overall, this analysis suggests that the bus demand generated by the Elizabeth line on bus feeder routes far outweighs the abstraction from parallel routes and from bus routes feeding into parallel rail lines, which results in a small net generation of bus demand of about 0.1 per cent of the total.

Another way of looking at the impact of the Elizabeth line on buses is by looking at bus demand around the key stations.

Figure 9.8 shows bus boarders in the catchment area of Elizabeth line stations where an increase in bus demand was forecast.

Figure 9.8 Bus demand around selected Elizabeth line stations, Tuesday to Thursday daily average, week commencing 27 Sep 2022 vs week commencing 17 May 2022.



Source: TfL Public Transport Service Planning.

The graph shows an increase in bus boarders around most stations. While some seasonal and pandemic recovery-related effects may be at play, the scale of change at some stations suggests that the Elizabeth line is generating demand on bus routes serving these stations. The exception is Canary Wharf, where bus boarders reduced by some six per cent over this period, thus suggesting potential demand abstraction in this area.

It is also interesting to look at bus-Elizabeth line interchange volumes, where increases have been observed at Abbey Wood, Woolwich, Custom House and Whitechapel while the Jubilee line stations in the east and southeast (Canning Town, North Greenwich and Canada Water) have all seen a reduction in bus-rail interchanges since the opening of the Elizabeth line, suggesting a reduced feeder role for buses at these locations.

9.8 Homes and jobs

The Elizabeth line is the most significant addition to London's transport network in a generation. The new railway is already transforming life and travel in London and the South East by reducing journey times, creating extra capacity, transforming accessibility and providing a huge economic boost.

TfL has developed a benefits management framework to evaluate the impacts of the Elizabeth line and help maximise the return on investment.

The homes and jobs benefits will materialise over time and are the focus of our longer-term evaluation. However, some early evidence can already be reported:

- The Crossrail Project (which delivered the Elizabeth line) created 75,000 job opportunities for businesses, generating the equivalent of 55,000 full-time jobs during its construction.
- The Crossrail Project further provided more than 5,000 job starts by local or previously unemployed people.
- Crossrail's environmental targets for air quality, recycled content, and carbon dioxide emissions were achieved or exceeded.
- A total of 54,725 new homes were delivered within one kilometre of future Elizabeth line stations between 2008 and 2021.
- Initial studies have also shown statistically significant evidence that Crossrail's announcement had a positive impact on residential house prices and rent values of offices within 500 metres of future Elizabeth line stations, indicating the increased attractiveness of these locations for people to live and work.

9.9 Conclusion and next steps

The initial findings from the transport impacts of the Elizabeth line presented in this chapter are both encouraging and generally in line with expectations.

They are, however, just the start of a comprehensive monitoring, evaluation and benefits realisation programme that will expand over the coming few years as the Elizabeth line moves through completion and its wider impacts are fully realised.

As the line reaches its full completion and the changes settle to become part of the everyday lives of all of those who travel in London, it will be possible to quantify and evaluate its impact on the Mayor's wider aims for transport as set out in the Mayor's Transport Strategy. This will include aspects such as the contribution of the Elizabeth line to the 80 per cent active, efficient and sustainable mode share target, to air quality and carbon dioxide emissions reductions, to active travel and to the Mayor's Vision Zero for road danger.

TfL will also be collaborating with the DfT and others in a comprehensive programme of evaluation of the transport and wider impacts of the scheme, for example on housing and economic regeneration. Outputs from these studies will be published separately, but summaries may be provided in future Travel in London reports as appropriate.

In this way, the full contribution of this new major infrastructure for London will be brought to life, comparisons will be made with prior expectations, and the insights gathered through monitoring and evaluation will allow the future operation of the line and the wider transport network to be optimised to maximise its benefits for London for years to come.

10. Other major transport infrastructure for London

10.1 Introduction

As well as the completion of the Elizabeth line described in the previous chapter, several other significant new infrastructure projects are being delivered in London.

It will be important over the coming years to carefully monitor the impact of these schemes to understand the extent to which they are fulfilling the objectives that have been set out for them and contributing to the wider aims of the Mayor's Transport Strategy.

Travel in London reports will be used to provide updates on these impacts as they arise, and this chapter reviews three important contemporary schemes in terms of understanding some initial impacts and setting out the wider approach to monitoring these over the coming years.

10.2 The Northern Line Extension one year on

Travel in London report 14 introduced the recently opened Northern Line Extension as an example of Good Growth and of the role of transport infrastructure in enabling the development of new homes and jobs in the Vauxhall Nine Elms Battersea (VNEB) Opportunity Area.

It described the expected benefits and early impacts of the scheme in terms of improved connectivity as a catalyst for Good Growth in the area, initial passenger numbers, and the number of homes and jobs being delivered.

This section updates those impacts just over a year since the opening.

Figure 10.1 Extract from the London Underground map showing the two new stations on the Northern Line Extension.

Source: TfL.

Regeneration in the local area

The Northern Line Extension is key to the regeneration of the local area and to delivering much-needed new homes and jobs.

Building on original projections set out in the Opportunity Area Planning Framework it is now forecast that about 20,000 new homes (including 4,500 affordable homes) can be delivered in the VNEB Opportunity Area.

The construction of the Northern Line Extension has been a significant factor in providing the necessary infrastructure to enable this scale of residential development and create a new vibrant commercial and residential quarter on London's south bank.

As of the end of March 2021, consent had been granted for 18,591 homes across the Opportunity Area, of which 8,144 had been completed. Of the units consented, 3,267 were affordable, with 1,387 units of those completed. These are provisional figures subject to publication of the 2020/21 Housing Authority Monitoring Report.

London is still on track for the creation of 25,000 jobs across the Opportunity Area and is already seeing high-profile businesses such as the US Embassy and Penguin Random House making their home in the area. They will shortly be joined by Apple as well as hundreds of new hospitality, retail and leisure businesses and cultural organisations.

Passenger numbers using the extension

The Northern Line Extension includes two new London Underground stations (Battersea Power Station and Nine Elms) whose use has been gradually increasing since the inauguration.

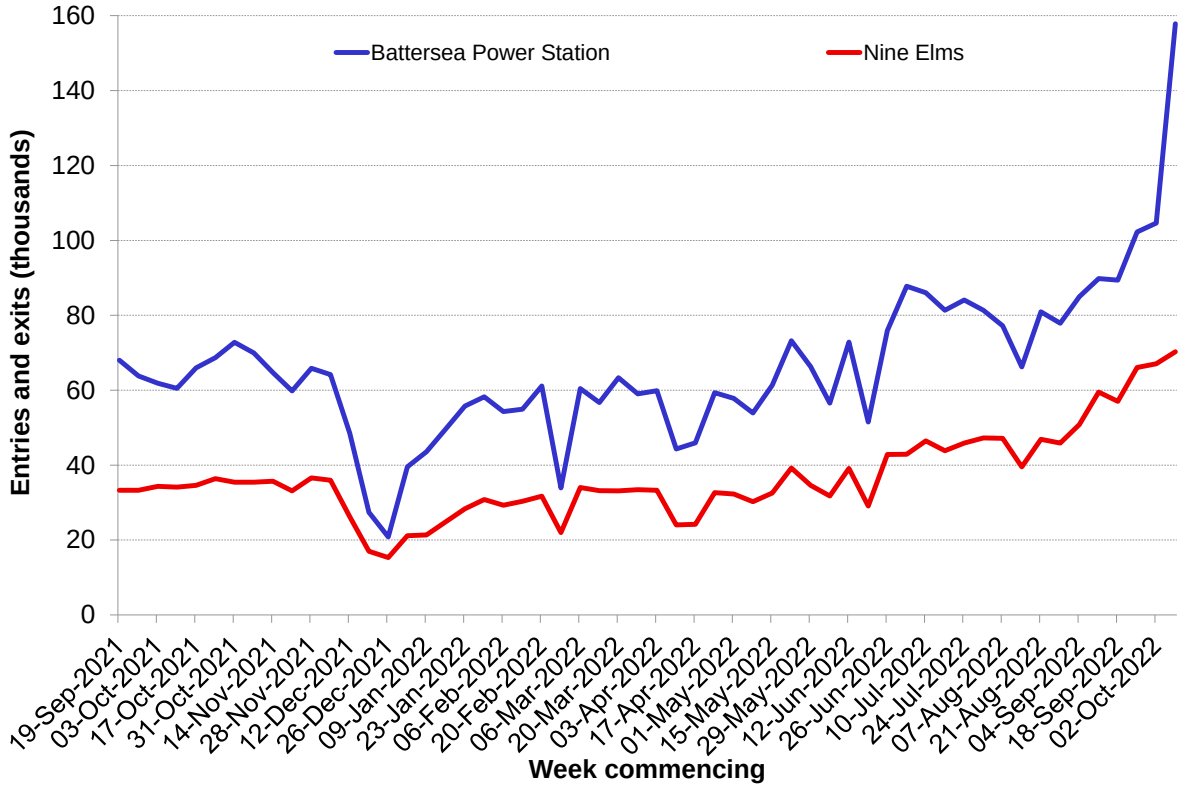
The latest data suggest that around 90,000 passengers enter either of these stations every week, with many more expected in the future as new developments in this Opportunity Area are completed and demand settles.

Figure 10.2 shows the weekly trend in entries and exits in more detail.

Demand has been slowly growing at both stations since they opened, despite various pandemic setbacks as well as the planned closure of the south section of the Bank branch between mid-January and mid-May as part of the Bank station upgrade programme.

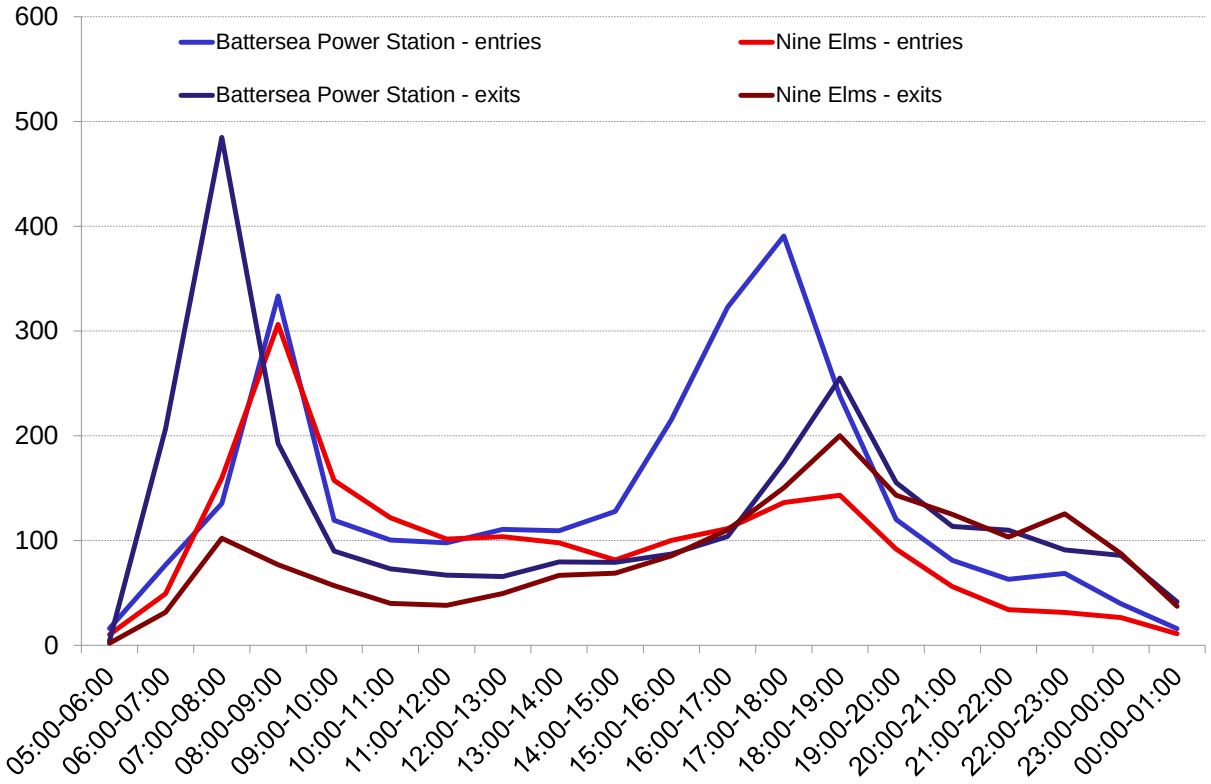
Growth, however, was boosted more recently by the introduction of a new timetable on the Northern line in late June 2022, which increased the frequencies to these two stations, and by the opening of the Battersea Power Station development in mid-October 2022, which led to a large spike in passengers during the first weekend.

Figure 10.2 Entries and exits to the Northern Line Extension, Sep 2021-Oct 2022.



Source: TfL Technology & Data.

Figure 10.3 Entries and exits to the Northern Line Extension by time of day, Monday to Friday average, week commencing 2 Oct 2022.



Source: TfL Technology & Data.

Figure 10.2 also clearly shows an important difference between the two stations, which is further supported by figure 10.3:

- Nine Elms largely serves as a local station supporting the residential developments in the area. This explains its slightly lower demand and potential market and the typical commuting patterns observed in its flows, with a peak of entries in the morning and a peak of exits in the evening.
- Battersea Power Station, on the other hand, is very different. It is built at the heart of major continuing developments in the area and very close to the power station itself, now a large-scale development boasting a mix of uses from residential to office space, retail and leisure. It is this mix which makes Battersea Power Station a much busier station, with peaks in early morning exits and early evening entries likely due to construction workers in the area as well as later morning entries and later evening exit peaks likely related to other types of commuting and the retail and leisure uses.

10.3 The London Overground extension to Barking Riverside

The extension to Barking Riverside is a four-kilometre extension of the Overground Gospel Oak – Barking line and is the first extension to the London Overground since 2015.

A new step-free station at Barking Riverside was opened in July 2022, providing a new rail link between Barking Riverside and Barking town centre as well as a step-free entry point to other London Underground, London Overground and National Rail services, reducing travel time by more than 15 minutes.

Together with the developer Barking Riverside Limited, TfL is continuing to complete work on the public areas around the station until 2023. These will form the district centre at the heart of the Barking Riverside development.

New Homes and Jobs

The draft new London Plan states that east London, with its large areas of formerly industrial brownfield land and improving transport links, should play a major role in London's growth, and that with investment in infrastructure, many of London's new jobs and homes can be accommodated in the east sub-region.

The opening of Barking Riverside station unlocks the full development potential of the largest housing development in east London. The masterplan for the site includes 10,800 new homes (half of which will be affordable), a new school, healthcare, shopping, community and leisure facilities, high-quality public spaces and connections to walking and cycling routes.

If public transport did not cater for demand, many trips would be dependent on private car use. Improvements have been made to bus services but this on its own would be unable to accommodate the level of passenger demand generated by 10,800 homes.

Coupled with planning conditions to ensure that public transport and housing are coordinated and delivered sustainably, no more than 4,000 homes could be occupied without the delivery of the London Overground extension to Barking

Riverside. Therefore, the London Overground extension to Barking Riverside has unlocked 6,800 homes of dependent development, helping to meet strategic housing targets for London and to accommodate future population growth.

The London Borough of Barking & Dagenham (LBBD) faces several issues relating to social and economic deprivation, which improved access to a larger labour market would help tackle. In 2015, the borough was ranked 12th of the 326 authorities in England in the Index of Multiple Deprivation, and 3rd of the 32 authorities in London.

When broken down further, LBBD scored 5th of the 326 authorities for 'Barriers to housing and services deprivation' and 7th for 'Income deprivation'. Between 2014 and 2016, LBBD had the second highest unemployment rate of all London boroughs, at 7.2 per cent, and 31 per cent of LBBD residents are paid below the London Living Wage.

The development of Barking Riverside, enabled by improvements to public transport connectivity, will help to address some of these challenges by delivering new affordable housing and schools. This development will also support the creation of new direct and indirect jobs through dynamic clustering and better connecting the area to job opportunities across London and the South East.

Connectivity and accessibility

The London Overground extension to Barking Riverside adds to the London Overground network, better connecting Barking Riverside with the wider public transport network and allowing the area to develop through providing greater accessibility to the rest of London.

The London Overground extension to Barking Riverside provides four trains per hour, enabling connections to Barking in about seven minutes compared to the 25 minutes that it previously took by bus. It provides a new transport link to Barking town centre and its District and Hammersmith & City line services, c2c services to London Fenchurch Street and Essex, along with a connection to the Elizabeth line station at Forest Gate via Wanstead Park.

Located on the north bank of the river Thames, east of Canary Wharf, City Airport and the Thames Barrier, the London Overground extension to Barking Riverside provides a major new artery into London's transport network, bringing the City within easy reach and allowing residents to access major employment and cultural centres within just half an hour.

Furthermore, Barking Riverside station is fully step free, bringing the total step-free stations across the London Overground to more than 60.

Based on the latest data available from September 2022 and bearing in mind the early stage of the full development, there were about 1,850 journeys on the London Overground extension to Barking Riverside each weekday and up to 1,250 journeys per day during the weekend.

Based on the current level of demand, about 580,000 journeys per year are forecast, and this is before considering future planned housing and related development.

Mode share and Good Growth

The London Overground extension to Barking Riverside provides a sustainable alternative to car travel for new residents by providing a station in the new town centre. By adding to the London Overground network, the extension will allow more people to easily access public transport and make it an attractive option for more journeys.

The masterplan also includes a carefully considered walking and cycling network with strong permeability. By improving public transport, more people will walk and cycle as part of their end-to-end journeys, and this will be further facilitated by secure cycle parking at Barking Riverside station.

Private car use is also discouraged by not providing car parking at the station and limiting parking to 0.7 spaces per household within the wider development.

10.4 Silvertown Tunnel: monitoring the impacts

Introduction

The Silvertown Tunnel will be a 1.4km twin-bore road crossing of the Thames, linking Silvertown with the Greenwich Peninsula. It is due to open in 2025 and construction is now well underway.

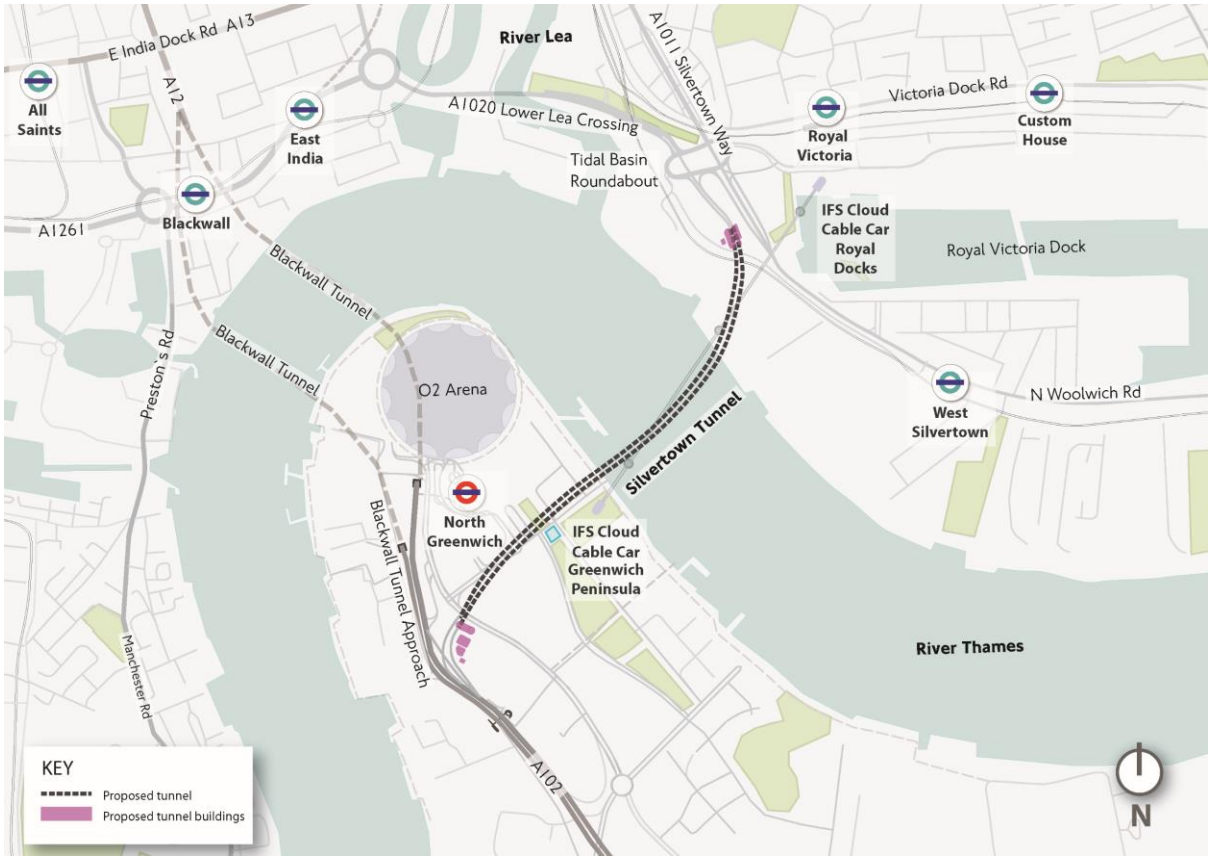
This modern tunnel, combined with a user charge and improved cross-river public transport, will improve public transport connectivity and the reliability and resilience of the wider road network, in particular relieving pressure on the nearby Blackwall Tunnel.

The tunnel is part of a wider package of improvements, including for walking and cycling, in the areas near the tunnel entrances as part of major regeneration of both sides of the river.

When it opens in 2025 the Silvertown Tunnel will:

- Provide more opportunities to cross the river by public transport with a network of zero-emission buses offering new routes and better access to more destinations.
- Effectively eliminate delays and queues at the Blackwall Tunnel, with journey times up to 20 minutes faster.
- Reduce the environmental impact of traffic congestion on some of London's most polluted roads.

Figure 10.4 Map of the Silvertown Tunnel.



Source: TfL.

More information about the basis for the scheme, its expected benefits and construction progress can be found on the Silvertown Tunnel page on TfL's website.

Monitoring and Mitigation Strategy

One of the conditions for the granting of the Development Consent Order (DCO) for the scheme is that TfL publishes monitoring reports. This will help ensure that the emerging impacts of the tunnel are fully understood, and that any adverse or unforeseen impacts, should they arise, can be detected and, if appropriate, mitigated.

Monitoring of pre-opening baseline conditions in the locality of the tunnel started during 2021/22 across a range of topics including:

- Traffic levels and road network performance
- Air quality and noise
- Social and economic conditions

The objective of the pre-opening monitoring is to collect data describing contemporary pre-tunnel conditions against which equivalent data gathered after the opening can be compared.

In this way, outcomes can be compared to expectations and the specific impacts of the new tunnel on traffic, the environment and the wider social and economic factors

can be discerned from the wider backdrop of trends affecting transport and travel in London.

The remainder of this section describes and exemplifies some of this baseline data.

Full baseline reports are available from the Silvertown Tunnel Implementation Group page on TfL's website and Travel in London reports will provide summaries of the emerging impacts of the scheme over an initial three-year-period after opening, with more baseline data to be published ahead of the opening in 2025.

Basis for comparison and evaluation of impacts

The longer-term evaluation of the impacts of the Silvertown Tunnel will be explored through a three year-long programme of monitoring after the opening, extended to five years if necessary.

The years before the opening of the tunnel will be used to collect baseline data describing pre-opening conditions across a range of topics of interest. Three monitoring work packages have been defined:

- Traffic and road network performance
- Air quality and the environment
- Social and economic conditions

This specific monitoring for the tunnel will take place in the wider context of the broader trends affecting travel and transport, which are set out and interpreted in these reports.

In addition, third-party secondary data is routinely collected that can also be used as part of the evaluation, for example relating to economic indicators.

Changes in the area affected by the tunnel may reflect both the direct impact of the tunnel itself, for example by increasing cross-river connectivity, as well as wider factors not directly related to the tunnel, for example the continuing effort to reduce air pollution across London. For this reason, it is necessary to assess changes observed locally, and to set these in the context of wider trends, to infer the specific impacts of the tunnel itself.

Because of the difficulty, especially in London, of defining fixed control areas (these notionally having similar characteristics to the area around the tunnel), the approach adopted for the monitoring is to use a series of flexible comparator areas against which to set the observed trends.

These areas range from groupings of London boroughs notionally unaffected by the tunnel through comparators such as inner and outer London (for example for air quality or traffic trends) and right up to national-level trends, as appropriate to the trend and/or data under consideration.

So, for example, in considering changes in local traffic flow or public transport patronage, where relatively significant local impacts are expected, a useful first comparison would be against trends seen in the rest of inner London.

In considering economic aspects such as changes in employment or relative deprivation, where the impact of the tunnel is expected to be small in relation to other influences, London-wide or national-scale comparisons may be more appropriate.

The main point is to use these flexible comparators to fully explore the findings of the monitoring and to understand their relative significance, rather than being constrained to a pre-specified fixed control area.

More information can be found in the individual monitoring reports.

Silvertown Tunnel Implementation Group

The Silvertown Tunnel Implementation Group (STIG) was set up under the terms of the DCO. It includes representatives from twelve London boroughs, the Greater London Authority and National Highways. TfL is required to consult with STIG on matters around planning and operating the scheme, including air quality and traffic monitoring, the setting of user charges and proposals for the new bus services. TfL is fully committed to publishing all relevant data as and when it is available throughout the monitoring period. The STIG papers set out a programme for when different aspects of this work are expected to take place and more information can be found on the STIG website.

Impacts on traffic levels, road network performance and road danger

A key aim of the Silvertown Tunnel is to ease congestion pressures on the road network in this part of east London, notably to provide capacity and resilience relief to the Blackwall Tunnel, all within the context of no overall growth in traffic in the area and a charging scheme for using the new tunnel to help achieve this.

Within this context, a programme of traffic monitoring has been put in place which aims to monitor both traffic levels and wider road network conditions in the area around the tunnel.

Traffic trends and changes will be measured using a range of metrics. These will be used to analyse the effects of the scheme along the key road corridors, river crossings and other strategic local links.

TfL began traffic monitoring in late 2021 to provide a robust pre-opening baseline against which trends following the opening can be compared. Monitoring will continue for at least three years after the scheme opens to evaluate its main impacts. Key metrics to be measured and assessed will be:

- Traffic flows, including cycles
- Journey times
- Journey time disruption
- Bus and rail data
- Road safety
- Travel behaviour

Traffic flows

New traffic counters will complement TfL’s existing estate of 305 counters across London, and in combination these will provide continuous flow data to detect any differential change on links likely to be affected by the tunnel and compare these to trends across the rest of London, where the new tunnel is not a significant factor affecting traffic flows.

In addition, use will be made of video analytics sensors, up to 40 in total, which provide full multi-modal classifications (including cycles) and can also be used to capture pedestrian flow data at specific sites.

Road network journey times

These will be measured using our established London Congestion Analysis Project method on links that are equipped with Automatic Number Plate Recognition cameras. This will cover the major strategic links in the vicinity of the new tunnel.

Alternative data on vehicle speeds, network performance and congestion, covering a more comprehensive set of links, will be available from established third-party sources.

Public transport

Patronage trends and operational performance on the public transport links in the vicinity of the tunnel will be monitored through established TfL sources.

The London-wide scope of this monitoring therefore provides a ready comparator that can be used to understand specific effects resulting from the opening of the tunnel, and the specific monitoring locally will allow an early assessment to be made of the operational performance of the bus network.

Other aspects of interest

These include:

- Road danger, which will be assessed using TfL's existing road danger monitoring (see section 4.4 of this report).
- Changes to patronage on the Woolwich Ferry and the IFS Cloud Cable Car.

Frequency of data collection and reporting

Certain types of data collected via the monitoring programme will be available live. However, our broad aim is to provide annual interpretative assessments of the key trends shown by the data.

Air quality

As part of the DCO for the Silvertown Tunnel, an Environmental Impact Assessment (EIA) was produced.

The EIA included a range of topic areas including air quality and noise and the outcomes were reported in the Environmental Statement (ES) for the scheme.

While the ES was rigorously tested at the Examination in 2016, it was decided that there was some remaining uncertainty associated with air quality (specifically nitrogen dioxide - NO_2) and noise levels that required further examination closer to the scheme opening date.

Following the outcomes of the ES and as part of the DCO, the Monitoring and Mitigation Strategy for air quality and noise was developed.

This sets out the requirements for more air quality and noise monitoring relating to pre- and post-scheme opening. TfL will then update the relevant transport and environmental models, rerun them, and develop its proposals for each element in conformity with the commitments, policies and procedures set out in the relevant certified documents and any DCO requirements.

Air quality monitoring

TfL has implemented a series of air quality monitoring programmes for the scheme.

This included wider NO_2 monitoring for the ES in 2015 and 2016 and NO_2 monitoring in 2019 around the Hoola Tower near the northern tunnel portal.

The ES concluded that other pollutants (including particulate matter) complied with the relevant Air Quality Strategy Objectives (2011), therefore no other pollutants are being monitored specifically for the Silvertown Tunnel.

The most recent and continuing programme of air quality monitoring started in December 2020. This air quality monitoring is additional to the extensive monitoring already conducted in London.

Sites were selected based on a map included within the Monitoring and Mitigation Strategy of proposed air quality monitoring locations, which were chosen based on the outcomes of the ES. All sites monitor NO_2 only. TfL held meetings with STIG representatives for the five local authorities where the monitoring locations were proposed to agree their locations.

Following this agreement, 38 triplicate passive diffusion tubes were installed across the London Borough of Newham, the Royal Borough of Greenwich, the London Borough of Tower Hamlets, the London Borough of Lewisham and the London Borough of Southwark. These will provide information on NO_2 levels across the wider road network that may be affected by changes in traffic levels associated with the Silvertown Tunnel.

In addition, three new continuous monitoring stations with NO_x analysers were installed close to the tunnel openings at roadside locations where the Silvertown Tunnel impacts are likely to be greatest. These are:

- TL4 (Tunnel Avenue, Greenwich)
- TL5 (Hoola Tower, Newham)
- TL6 (Britannia Gate, Newham)

The data from these three continuous monitoring stations is reported on the London Air Quality Network website.

In October 2022, the results of the first year of NO_2 monitoring for 2021 were published on the Silvertown Tunnel Implementation Group page on TfL's website.

The first Silvertown Tunnel annual air quality baseline report sets out the baseline data gathered in the context of the Air Quality Strategy Objective Values (2011).

Diffusion tube monitoring of NO_2

The results of the diffusion tube monitoring indicate that annual mean NO_2 concentrations for 2021 comply with the Air Quality Strategy objective at most of the

38 monitoring sites, including in the vicinity of the tunnel. There were exceedances of the objective recorded at the following three sites:

- DT3 Douglas Road, Newham Way (40.2µg·m^{-3})
- DT17 East India Dock Road (42.2µg·m^{-3})
- DT24 A3 Blackheath Hill (42.6µg·m^{-3})

All other diffusion tube monitoring locations achieved the annual mean NO_2 air quality objective, including all the extra sites installed around the Hoola Tower.

Continuous monitoring of NO_2

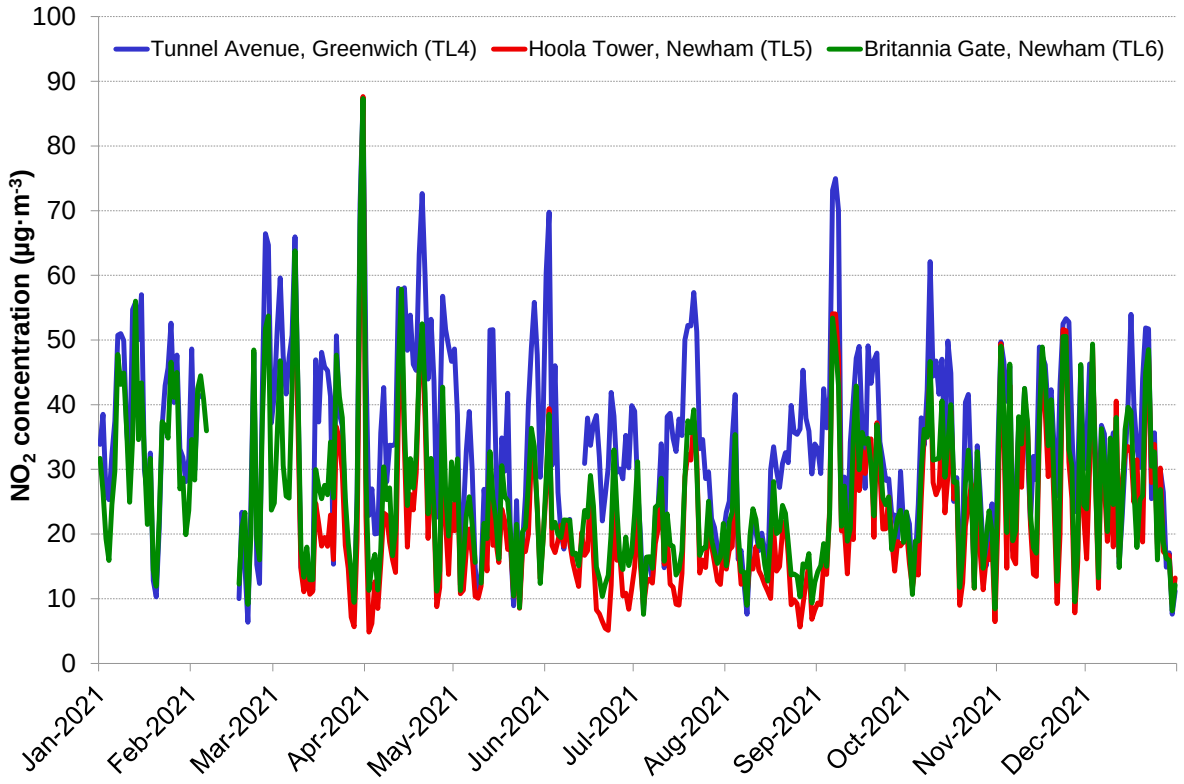
The annual mean NO_2 concentrations at all three continuous monitoring sites complied with the Air Quality Strategy objective in 2021 with a maximum concentration of 34.3µg·m^{-3} recorded at TL4 (Tunnel Avenue).

Average daily concentrations follow a similar trend at all three continuous monitoring sites, as shown by figure 10.5.

As with other baseline data, the main interest will come after the opening when trends at these sites can be compared to those at similar sites elsewhere in London.

It is expected that annual mean NO_2 concentrations will continue to decline due to continued vehicle fleet improvements as a result of London-wide measures such as the ULEZ and wider interventions including electrification of the fleet.

Figure 10.5 Daily NO_2 concentrations at three monitoring sites near the Silvertown Tunnel, Jan-Dec 2021.



Source: London Air (www.londonair.org.uk).

Next steps

NO_2 monitoring will continue each year at the same sites for a minimum of three years before the opening and then for a minimum of three years afterwards. Annual monitoring reports will be produced summarising yearly concentrations, and analysis will be undertaken to determine yearly trends in concentrations across sites.

After the opening, more analysis will be undertaken with the aim of isolating the impacts of the Silvertown Tunnel, which may include the use of statistical analysis, the removal of seasonal and meteorological influences, and the consideration of wider London data and trend interpretation.

The monitoring will also be used in the refreshed assessment of the Silvertown Tunnel impacts. A comparative analysis will be undertaken once the updated air quality modelling work has been completed to understand the scheme effects. The environmental outcomes will be reported in the Environmental Assessment Compliance Report due in 2023.

Social and economic conditions

The tunnel is expected to contribute towards the improvement in the social and economic conditions for residents and businesses in the area, which hosts some of the most deprived areas in the country.

By improving cross-river connectivity and travel reliability, businesses should benefit from easier access to wider markets. Residents will also benefit from new and easier travel options that expand their opportunities for employment and social interaction.

The impacts on road traffic will be managed to ensure that there is no net gain in traffic and that the benefits of greater reliability for cross-river trips provided by the new tunnel are effectively captured through network operation.

TfL is adopting a three-pronged approach to gather and interpret evidence relating to the social and economic impacts of the tunnel. This includes:

- Primary surveys of a representative sample of businesses in the vicinity of the tunnel, including in-depth focus groups.
- Primary surveys of residents in the vicinity of the tunnel.
- Gathering and interpreting data from secondary sources, such as the London Travel Demand Survey (LTDS), to provide more evidence about the impacts of the tunnel, and to contextualise those impacts.

Three waves of primary surveys are planned prior to the Silvertown Tunnel opening (in 2021, 2023 and 2024), with a further three waves afterwards. A summary of the findings of the 2021 surveys can be found on the Silvertown Tunnel Implementation Group page on TfL's website.

Illustrating the social and economic baselines

Baseline data is intended to be representative of conditions before the tunnel opens for later use in comparison. Of itself, therefore, it does not yet provide insight about the tunnel.

This is important because social and economic conditions and travel patterns in the area affected by the tunnel have developed over decades without the tunnel. Travel

patterns, personal social networks and business location decisions have implicitly taken account of the historic lack of connectivity and adapted to it.

For some, current conditions may be optimal. For others, factors such as traffic congestion at the Blackwall Tunnel may represent a cost that could usefully be removed. For others, cross-river interaction, for example for employment, may currently be lower than it could be, due to the lack of cross-river connectivity.

Furthermore, this constraint may not actually be recognised, given the adaptations people have already made. This does not reflect on the case for the tunnel, which is partly to improve this historic lack of connectivity. However, at this baseline stage it is important to view the results from surveys of businesses and residents in this context.

The following three examples briefly illustrate how this aspect of the monitoring will be carried forward.

Cross-river travel

Data on cross-river travel will arise from a range of sources as the monitoring progresses. A key source will be our long-standing LTDS.

Table 10.1 illustrates how the historic lack of cross-river connectivity in east London constrains cross-river travel, compared to west London, where the river is less of a barrier and there are more frequent crossing opportunities.

Considering London residents and looking at trips from each borough abutting the river to adjacent boroughs (only) to remove the effect of longer-distance river-crossing trips (for example commuting to central London, which is mostly to destinations on the north side of the river), it is seen that:

- The proportion of local travel that involves crossing the river decreases from west to east, reaching almost zero in relation to trips from boroughs such as Bexley.
- The easternmost boroughs, correspondingly, have higher proportions of travel to adjacent boroughs on the same side of the river.

It might be expected that these proportions will re-balance somewhat once the tunnel opens, as cross-river travel options are improved, and this will be monitored through the LTDS.

Table 10.1 Destination of 'local' cross-river trips made by London residents, LTDS 2019/20.

Origin borough	Trips to adjacent boroughs on the same bank	Trips to adjacent boroughs on the opposite bank	Trips within borough	Other trips
South bank boroughs				
Richmond upon Thames	3%	9%	66%	22%
Wandsworth	11%	6%	59%	25%
Lambeth	10%	5%	52%	33%
Lewisham	6%	1%	60%	32%
Greenwich	14%	2%	68%	16%
Bexley	12%	0%	72%	16%
North bank boroughs				
Hounslow	3%	8%	65%	24%
Hammersmith & Fulham	11%	7%	52%	30%
Kensington & Chelsea	30%	5%	42%	23%
Westminster	7%	5%	40%	48%
Tower Hamlets	6%	1%	60%	33%
Newham	10%	2%	65%	23%
Barking	18%	1%	61%	20%
Havering	7%	0%	79%	14%

Source: TfL City Planning.

Indices of multiple deprivation

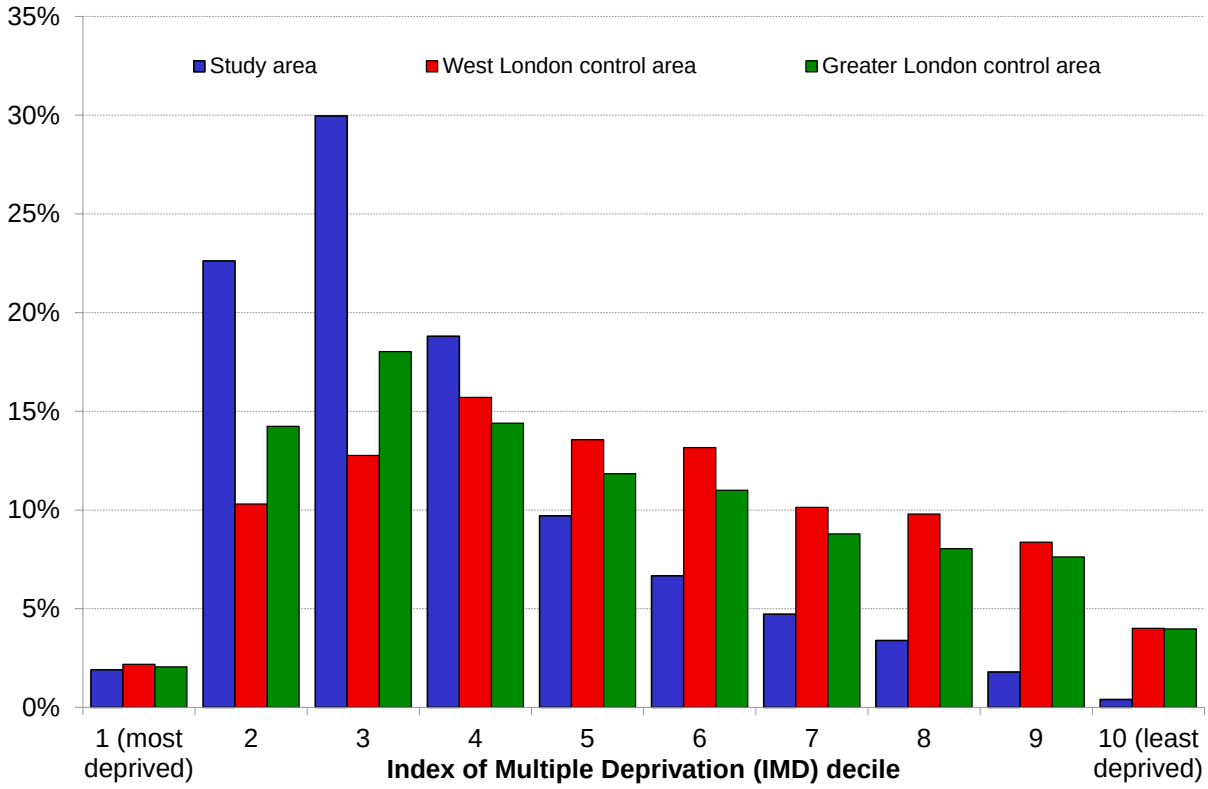
The Index of Multiple Deprivation (IMD) is the official measure of relative deprivation in England and was last published in 2019 by the Ministry of Housing, Communities and Local Government.

This measure is based on 39 separate indicators, organised across seven domains of deprivation (for example income, health, crime), which are weighted and combined to calculate the IMD score.

The area affected by the tunnel has a significant proportion of population living in areas with high levels of deprivation, when compared with all areas in England.

Figure 10.6 shows the distribution of population in the study area, a comparator area in west London and Greater London as a whole by IMD decile.

Figure 10.6 Index of Multiple Deprivation in the area around the Silvertown Tunnel and in control areas, by decile, 2019.



Source: Department for Levelling Up, Housing and Communities.

It is seen that the study area ranks significantly higher than both comparator areas in terms of the proportion of the population in the lower IMD deciles.

It may be expected that, by improving cross-river connectivity and therefore social and economic opportunity the tunnel would contribute to a relative improvement in these scores over time.

However, the factors influencing IMD are complex and wide-ranging; it may not be possible, therefore, to definitively attribute any changes.

The 39 component domains of the IMD, however, should provide a comprehensive context to explore relative social and economic change in the area affected by the tunnel, whether influenced by the tunnel or not.

Business population, business performance and transport issues

Primary surveys of a representative sample of businesses located in the area affected by the tunnel should provide first-hand accounts of how the tunnel has affected them over the timescale of the monitoring.

A range of measures have been baselined, looking at factors that describe the nature of the business population, business operations, business performance and outlook and their relationship to transport facilities and issues, in particular cross-river travel.

11. Supporting Good Growth

11.1 Introduction

This chapter explores aspects of the Mayor's aim for Good Growth, particularly in relation to London's Opportunity Areas.

The chapter also takes an initial look at some aspects of the legacy of the London 2012 Olympic and Paralympic Games, some 10 years after this successful event, ahead of a fuller consideration in Travel in London report 16 in 2023.

11.2 London's Opportunity Areas

Opportunity Areas are designated through the London Plan as areas with particular development potential. They have an important role in delivering the 66,000 extra homes per year that London needs.

A list of Mayoral commitments for ensuring that Opportunity Areas fully realise their growth and regeneration potential is set out under London Plan policy SD1. This policy sets out the role of TfL in promoting and championing Opportunity Areas as well as in identifying where public investment and intervention is required to achieve growth potential.

TfL works closely with the Greater London Authority (GLA), London boroughs and other key stakeholders to ensure that Opportunity Areas are delivered in line with the transport principles of Good Growth. Central to this is the requirement to support sustainable and active travel and to avoid car-dependent development.

The delivery of homes, jobs and infrastructure in Opportunity Areas should be monitored and action should be taken where necessary to overcome any barriers.

TfL's monitoring work in Opportunity Areas is based around the Mayor's Transport Strategy principles of Good Growth and seeks to understand the extent to which these principles are being realised on the ground.

This section describes four metrics that can be monitored on an annual basis, and which describe progress in Opportunity Areas towards:

- Housing delivery
- Good access to public transport
- People choose to walk and cycle
- Carbon-free travel

The monitoring relies on available data from the GLA Planning Data Hub and the London Travel Demand Survey (LTDS).

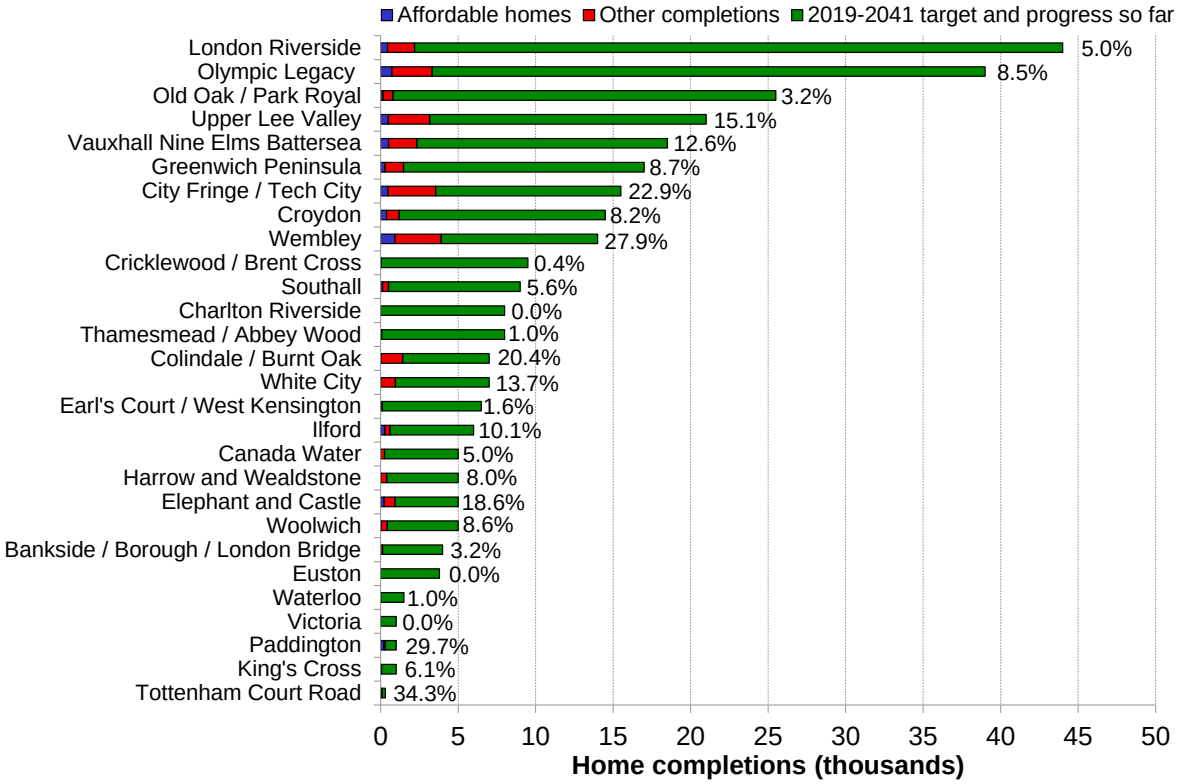
The LTDS sample size is insufficient to analyse each Opportunity Area individually and so adopted Opportunity Areas have been aggregated. The LTDS sample size was further limited during the pandemic in 2020/21 and 2021/22, and this means that in some cases reporting is limited to 2019/20.

11.3 Monitoring housing delivery in London's Opportunity Areas

The capacity for the delivery of new housing is a defining feature of an Opportunity Area. Typically, Opportunity Areas present opportunities for high-density sustainable development on brownfield sites. TfL tracks progress of housing delivery in adopted Opportunity Areas against indicative capacities set out in the London Plan 2021.

Figure 11.1 shows the London Plan indicative capacity for new homes in the adopted Opportunity Areas for the 2019-2041 period and reports against them the total number of homes and total number of affordable homes that were delivered between April 2019 and March 2021. Note that only the Opportunity Areas with adopted boundaries are included.

Figure 11.1 Homes delivered in Opportunity Areas with adopted boundaries by type, Apr 2019-Mar 2021.



Source: Greater London Authority.

A total of 28,284 homes have been delivered in adopted Opportunity Areas over the April 2019-March 2021 period, which represents nine per cent of the London Plan target for the adopted Opportunity Areas. This is in line with the rate required to deliver the target by 2041.

Four of the Opportunity Areas received more than 3,000 completed homes over this two-year period: Olympic Legacy (3,329), Upper Lee Valley (3,170), City Fringe/Tech City (3,550) and Wembley (3,903).

The Opportunity Area with the highest number of affordable homes delivered over the two years was Wembley, with 919 affordable homes, followed by the Olympic Legacy Opportunity Area with 722 affordable homes.

Housing on TfL Land

More generally, TfL's ambitious housing programme continues to progress. Construction is underway on some 1,700 homes on nine sites across London and TfL is on track to start work on more than 2,500 new homes this financial year. Construction is nearly complete on 350 homes at Blackhorse View (Waltham Forest), and the tallest building on its 619-home Kidbrooke site (Greenwich) topped out in summer 2022.

In 2021/22, 467 homes were started across three sites: Wembley Park (454 homes), Aylesbury Street (nine homes) and Albany Road (four homes), and nine homes were completed at Bond Street Oversite Development.

Rising construction costs and inflation are impacting the wider industry and TfL and its partners are working through what this means for their projects. TfL is also aware of the wider capacity issues with the electricity grid in west London. This could potentially delay some schemes, including 460 homes at Southall (Ealing). TfL is working closely with its partner Grainger as part of the joint venture, Connected Living London, to mitigate the grid capacity issues and is working on a temporary supply which could still allow construction to start this financial year.

11.4 Good access to public transport

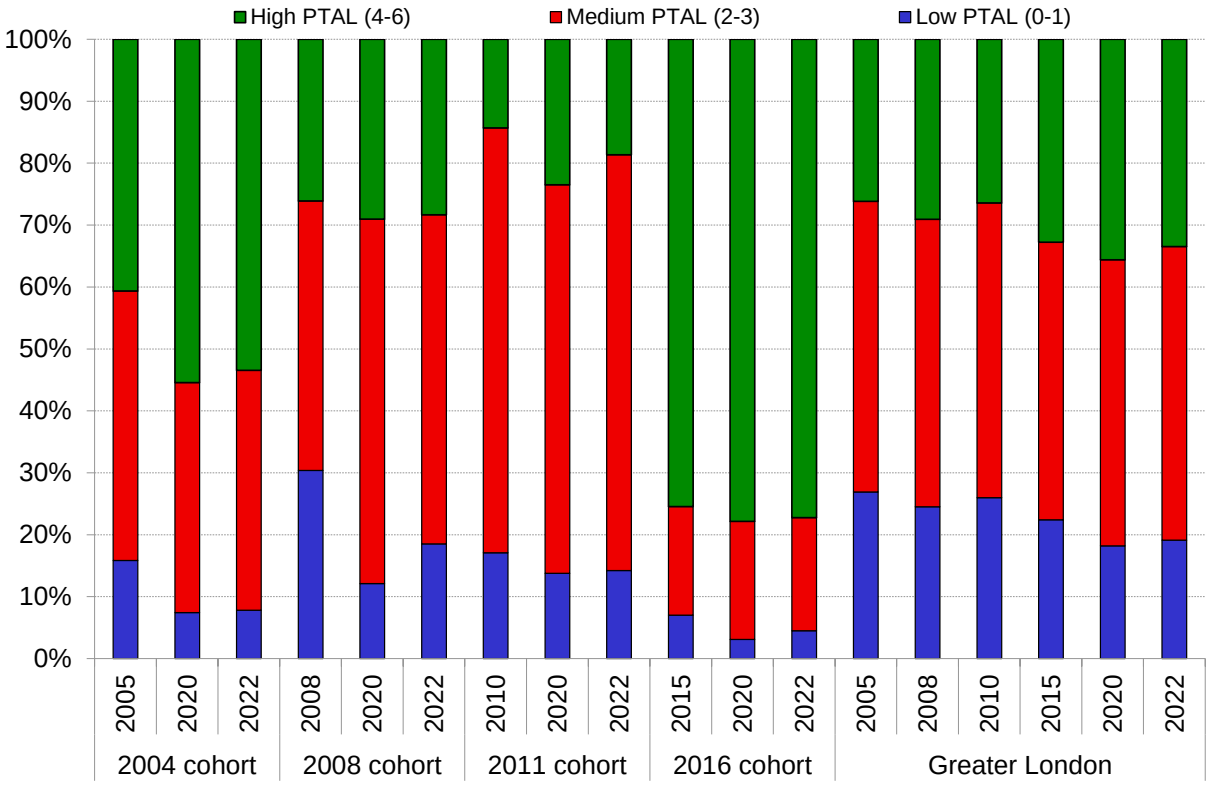
Accessibility to public transport is an important measure of Good Growth. The more connected people are to the public transport network, the more likely they are to choose public transport over car travel. This in turn should reduce congestion and the negative externalities associated with it (for example air pollution).

Access to public transport can be improved through better public transport, walking and cycling links or by building new homes in better connected areas (for example around a London Underground station).

Traditionally TfL has measured access to public transport using the Public Transport Access Level (PTAL) metric. The Mayor's aim is to increase the proportion of people living in areas with high PTAL within Opportunity Areas to 56 per cent by 2030.

Figure 11.2 shows the proportion of the population living in Opportunity Areas with adopted boundaries by PTAL category, aggregated across Opportunity Area cohorts in the designation year and against 2020 and 2022 (the most recent year for which data is available). The respective values for Greater London are also shown for reference.

Figure 11.2 Proportion of population by Public Transport Access Level category, Opportunity Area cohorts and Greater London average, 2005-2022.



Source: TfL City Planning.

The graph shows that all Opportunity Area cohorts have experienced an increase in the proportion of their respective populations that live in high PTAL areas, and a decrease in the proportion of their respective populations that live in low PTAL areas between the Opportunity Area designation year and 2022.

This is also true for London as a whole: since 2005 the proportion of London's population that live in high PTAL areas has risen from around a quarter to around a third, while the proportion living in low PTAL areas has declined from around a quarter to around a fifth.

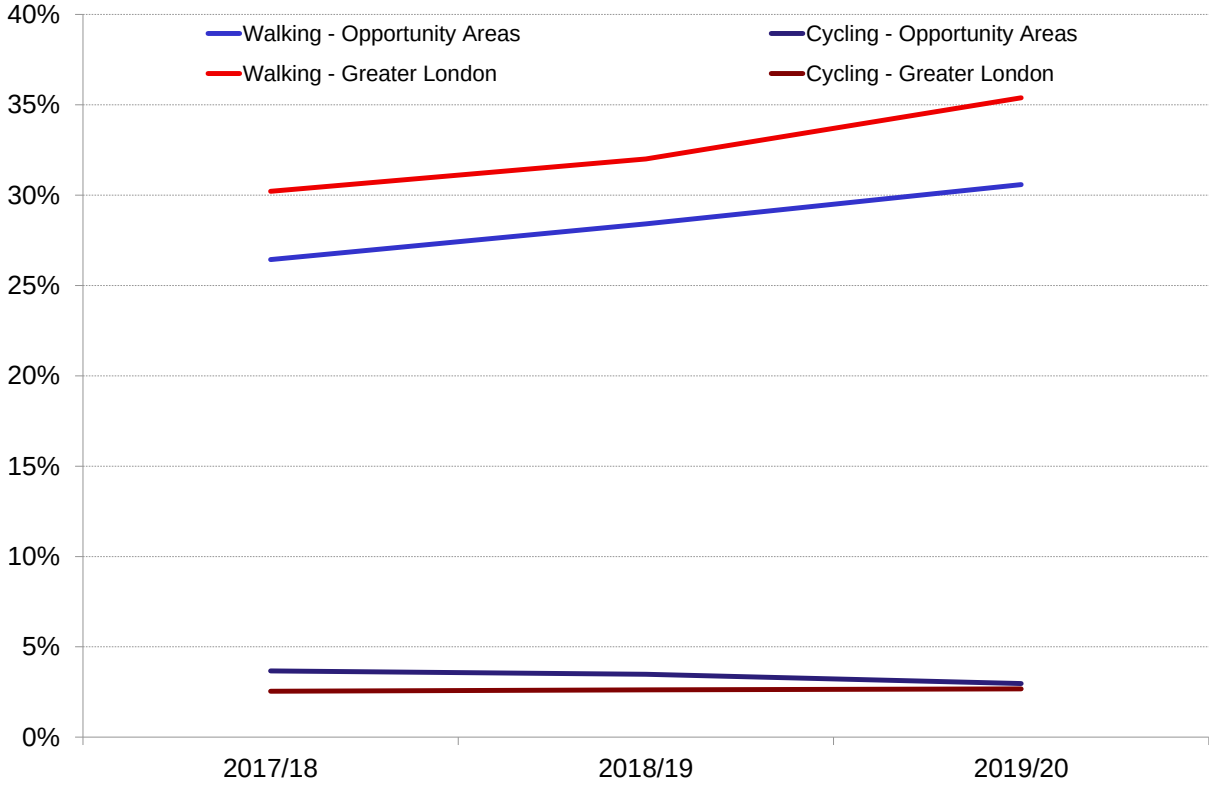
These figures indicate that TfL is making good progress in the spatial planning work towards increasing the PTAL of London's population. However, a more detailed consideration of the data shows that between 2020 and 2022 there has been a slight reversal in the progress being achieved against this metric, which is related to public transport changes during the pandemic.

TfL will continue to monitor this situation over future years.

11.5 People choose to walk and cycle

Figure 11.3 shows the change in walking and cycling trip-based mode shares over time at both the Opportunity Area and Greater London level.

Figure 11.3 Walking and cycling mode shares in Opportunity Areas and Greater London, 2017/18-2019/20.



Source: TfL City Planning.

There is a clear upward trend in the walking mode share in both samples: across the three-year period walking trips in the Opportunity Areas rose from 26 per cent to 31 per cent, while across Greater London the rise was from 30 per cent to 35 per cent.

For cycling, while there is an upward trend for the mode share at the Greater London level (from 2.5 per cent to 2.7 per cent), there is a downward trend in the Opportunity Areas (from 3.7 per cent to 3.0 per cent).

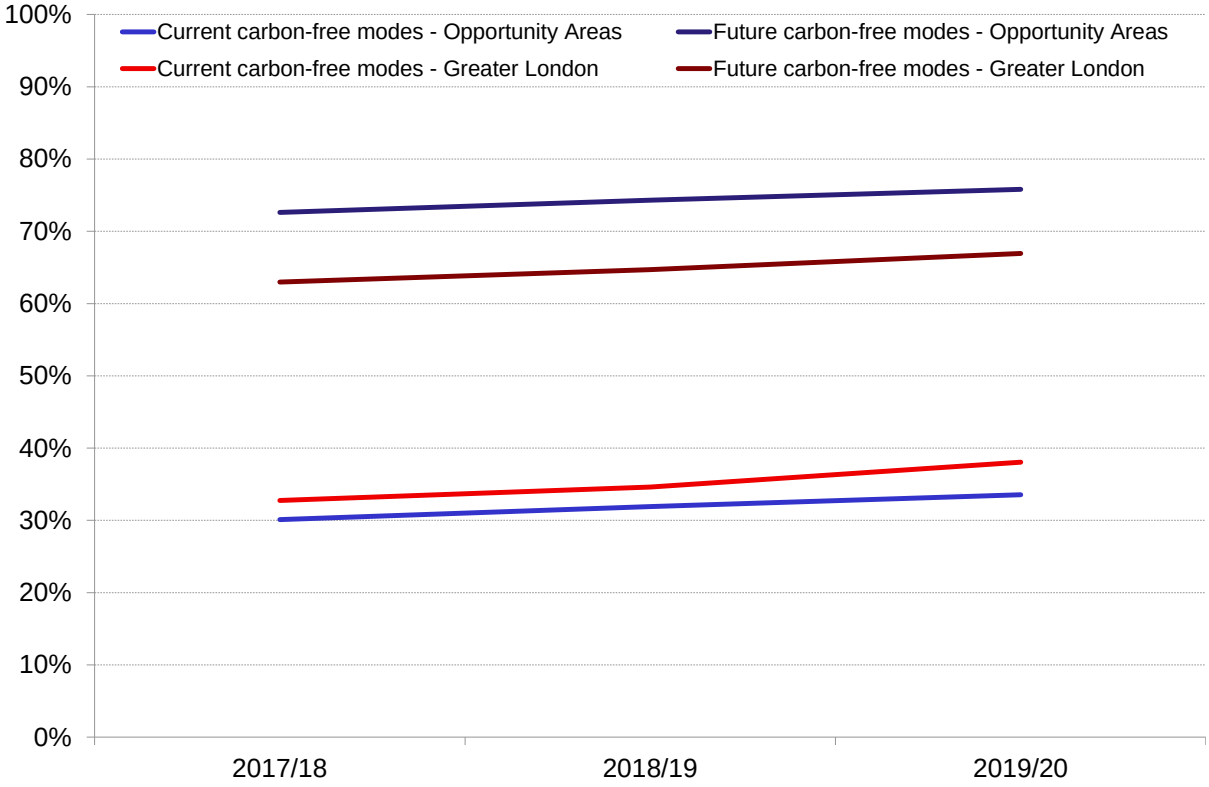
The lower relative mode share for walking trips in the Opportunity Areas compared to the rest of London and the apparent reduction in cycle trips require further investigation. It is possible that the whole of London is not an ideal comparator for the Opportunity Areas, while provision of extra public transport as development in these areas matures may be affecting the proportion of trips on other modes.

11.6 Monitoring the 'carbon-free travel' Good Growth principle in Opportunity Areas

The carbon-free modes are currently walking and cycling. Our ambition, however, is for the remaining fossil fuel-based transport in London to be electrified and to become carbon free as the electricity grid decarbonises in line with the Mayor's target of a net-zero carbon London by 2030.

Therefore, both the current carbon-free mode share (including walking and cycling) and a 'future carbon-free' mode share (including also public transport) are reported in figure 11.4.

Figure 11.4 Carbon-free mode shares in Opportunity Areas and Greater London, 2017/18-2019/20.



Source: TfL City Planning.

The graph shows that the carbon-free mode share is higher across London as a whole than in the Opportunity Areas, reflecting the lower walking mode share in the Opportunity Areas. However, future carbon-free mode share is higher in the Opportunity Areas due to the higher public transport use and lower private car use overall.

There is a clear upward trend in both measures with increases in the Opportunity Areas of similar scale to London as a whole. Across the three-year period, current carbon-free (walking/cycling) mode share in the Opportunity Areas increased from 30 per cent to 34 per cent; and future carbon-free mode share in the Opportunity Areas increased from 73 per cent to 76 per cent.

11.7 Focus on: the Olympic Legacy Opportunity Area

The Olympic Legacy Supplementary Planning Guidance (SPG) 2012 set out a vision for making the Queen Elizabeth Olympic Park and its surroundings ‘a distinctive and well-connected place where people can live and work sustainably and offering a wide range of new jobs and homes’.

Ten years on from the London 2012 Olympic and Paralympic Games, this section reviews progress being made towards the vision for this new part of London.

Formed in April 2012, the London Legacy Development Corporation (LLDC) acts as the planning authority for the Queen Elizabeth Olympic Park and its surrounding area, all of which falls within the Olympic Legacy Opportunity Area. The LLDC

carries out all the planning functions a Local Planning Authority would usually have responsibility for, including Local Plan preparation and adoption.

Improved connectivity

The Olympic Legacy SPG acknowledged the sustainable connectivity barriers of the river Lea and the strategic transport infrastructure cutting across the area around the Queen Elizabeth Olympic Park. The SPG also emphasised the importance of improving the area's connectivity to achieve sustainable development.

Since the decision in 2005 to award the 2012 Olympic and Paralympic Games to London, there has been significant investment in public transport infrastructure, focused on Stratford station, to support the continued regeneration of the area, including:

- **2006**: Lifts providing step-free access to high-level platforms brought into service.
- **2007**: TfL took over the North London line (formerly Silverlink), then terminating at Stratford. This was the start of the London Overground.
- **2007**: New DLR platform opened at Stratford station.
- **2009**: High-speed commuter services started operation from Stratford International station.
- **2010**: New platform 3a for westbound Central line trains opened in advance of the London 2012 Olympic and Paralympic Games.
- **2011**: New mezzanine ticket hall along with extra staircases and lifts opened in advance of the London 2012 Olympic and Paralympic Games.
- **2011**: DLR extension to Stratford International opened, including new DLR stations at Stratford High Street and Abbey Road and making use of previous North London line platforms at Stratford station.
- **2011**: Stratford City bus station opened.
- **2011**: New ticket hall opened with the Westfield Stratford City shopping centre.
- **2013**: Improved frequencies on the Central and Jubilee lines.
- **2018**: Improvement works at Hackney Wick station completed, improving the connectivity through the area as well as the station capacity.
- **2022**: Elizabeth line services started serving Stratford and Maryland stations, allowing people to travel from Stratford to Paddington in just 19 minutes.

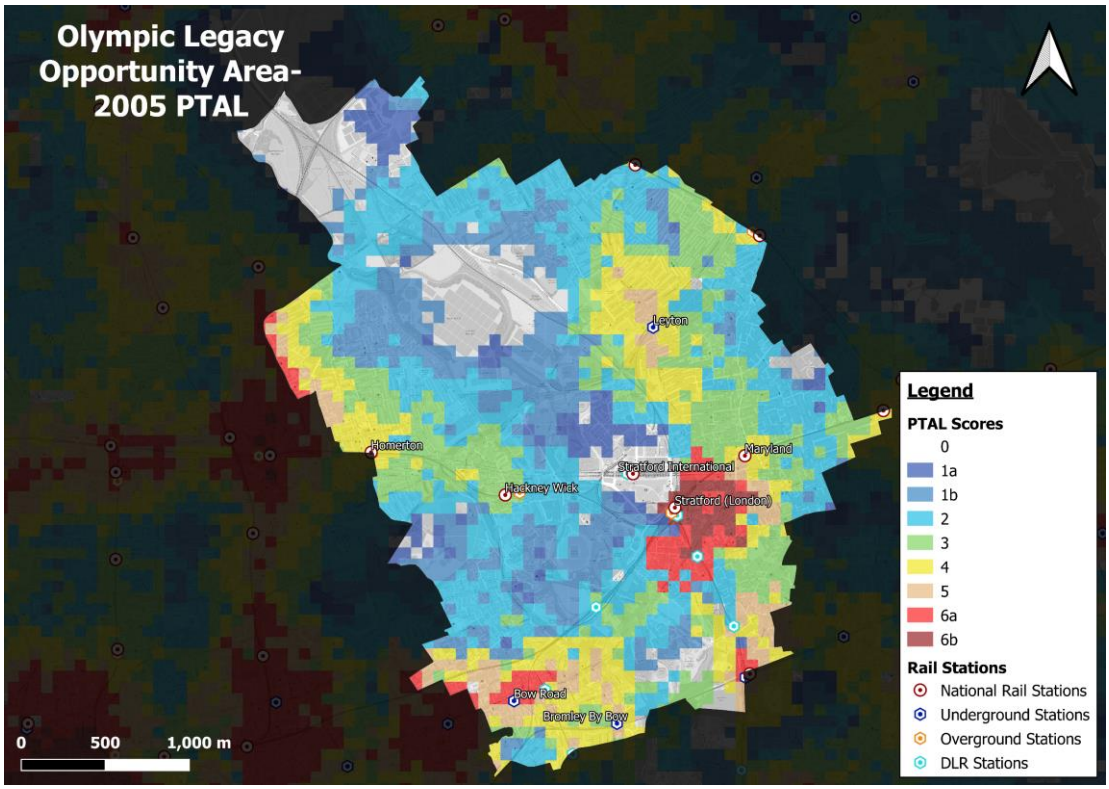
The Stratford City mixed-use development included transport elements such as Stratford station's new northern ticket hall and the delivery of new roads and a new bus station to support increased connectivity.

In the Queen Elizabeth Olympic Park, the Post-Games Transformation and continuing Legacy Communities Scheme are also delivering new infrastructure to provide bus connectivity and support neighbourhoods and development in the East Bank.

There have also been other local connectivity interventions such as the Stratford town centre gyratory removal and corridor improvements to Stratford High Street to support increased bus connectivity.

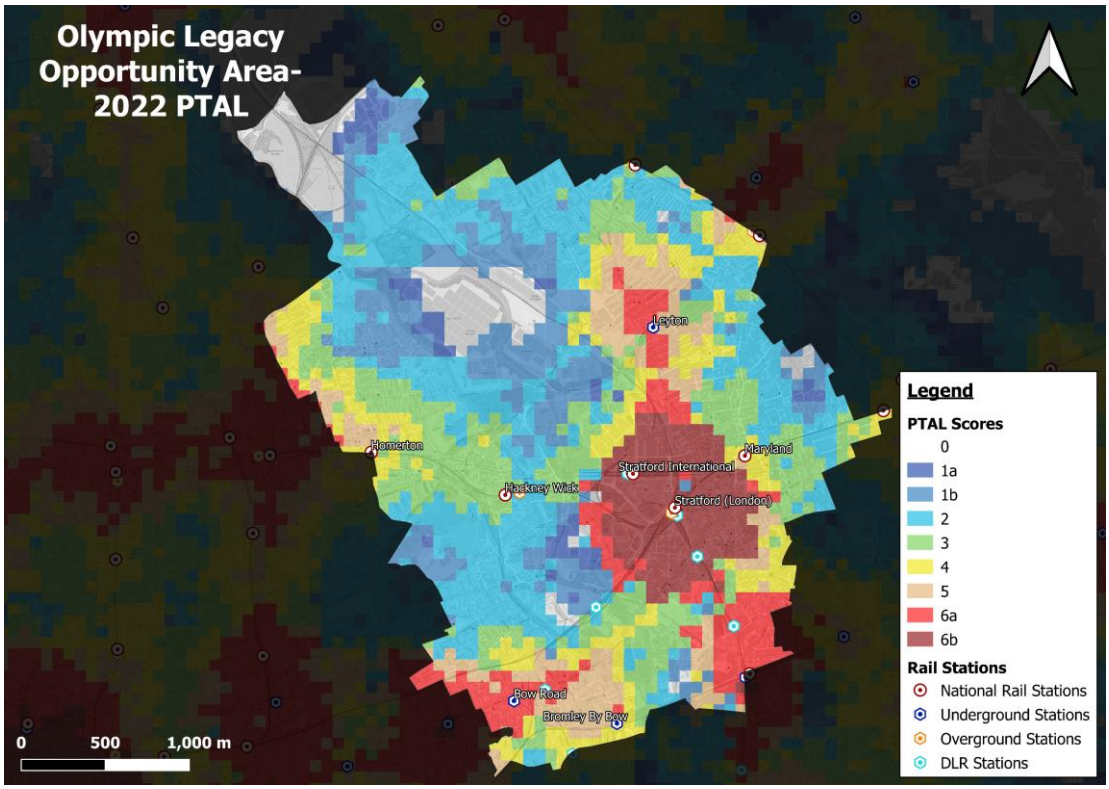
These interventions have significantly improved the PTAL of the Olympic Legacy Opportunity Area. Figures 11.5 and 11.6 show the PTAL across the Opportunity Area in 2005 (one year after the Opportunity Area's designation in 2004) and in 2022, respectively.

Figure 11.5 Public Transport Access Level across the Olympic Legacy Opportunity Area, 2005.



Source: TfL City Planning.

Figure 11.6 Public Transport Access Level across the Olympic Legacy Opportunity Area, 2022.



Source: TfL City Planning.

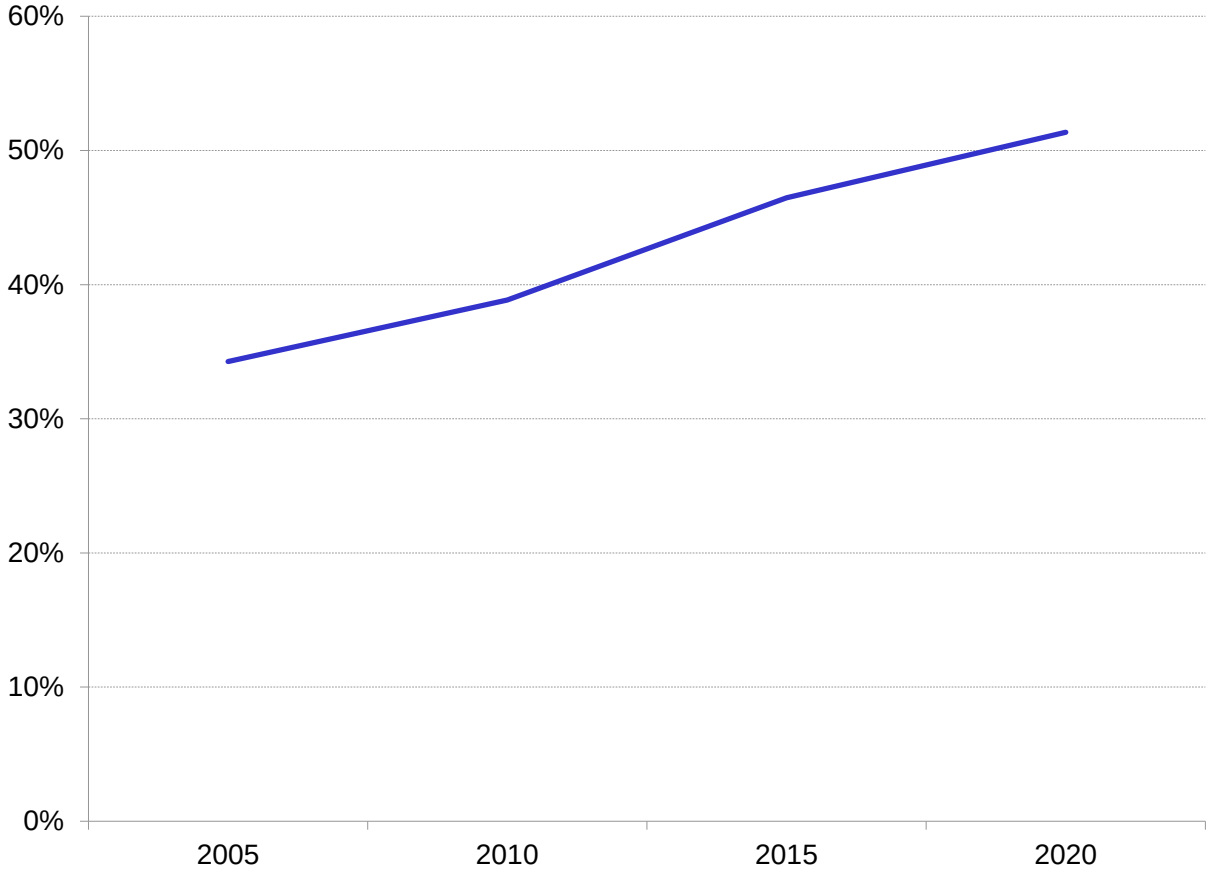
The maps clearly show the expansion of areas with higher PTAL across the Opportunity Area from 2005 to 2022.

However, there are still pockets of severance and differential accessibility across the area, largely caused by physical barriers such as railways, major roads and natural barriers like the river Lea; and there is continuing work to enhance local connectivity and walk and cycle links to connect to public transport routes.

A further way to consider the connectivity of the area is by assessing the proportion of the population that live in areas with high PTAL.

Figure 11.7 shows the growth in the proportion of the Olympic Legacy Opportunity Area population living in areas of high PTAL.

Figure 11.7 Proportion of population in the Olympic Legacy Opportunity Area living in a high Public Transport Access Level area, 2005-2020.



Source: TfL City Planning.

This proportion increased from around one third of the population in 2005 to around one half of the population in 2020, which represents strong progress towards the Mayor's aim for 56 per cent of the population of Opportunity Areas to live in high PTAL areas by 2030.

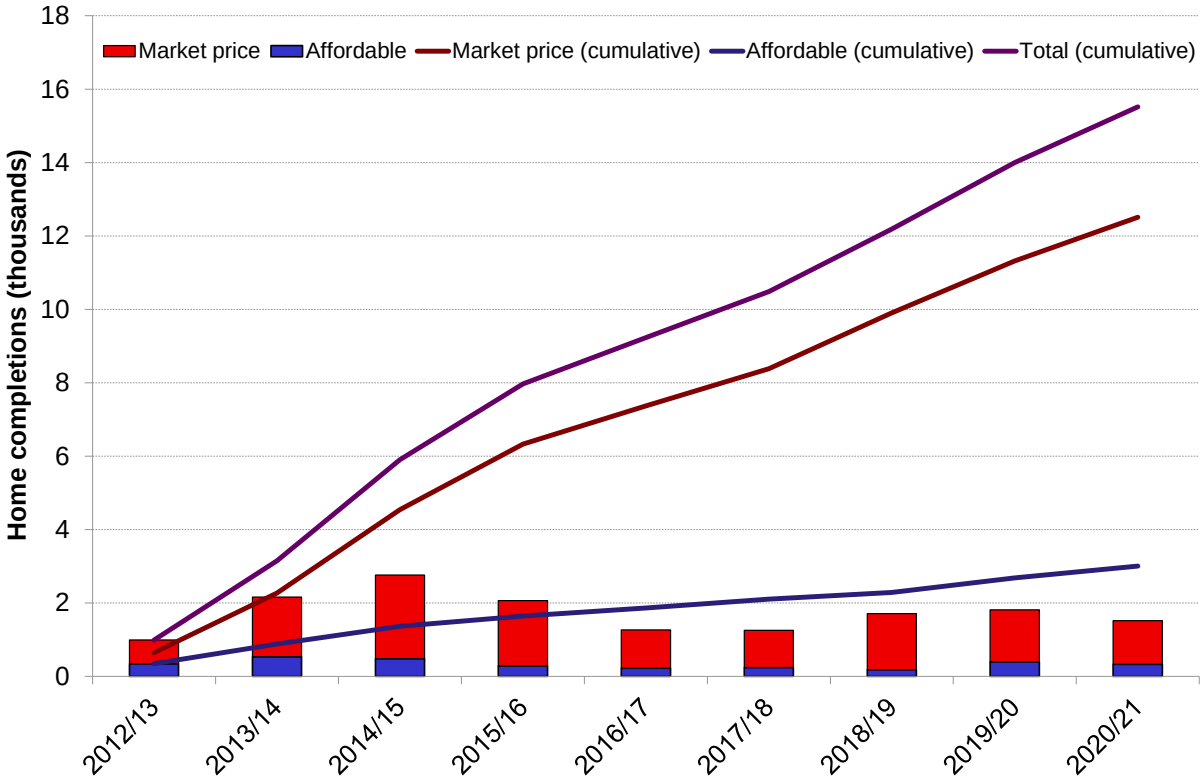
Housing delivery

The Olympic Legacy SPG identified the capacity for 32,000 new homes in and around the Queen Elizabeth Olympic Park in the 20-year period after the London

2012 Olympic and Paralympic Games. Now, ten years on, it is a good time to take stock of progress towards this housing target.

Figure 11.8 shows affordable, market and total housing completions in the nine years after the London 2012 Olympic and Paralympic Games.

Figure 11.8 Housing completions in the Olympic Legacy Opportunity Area by type, 2012/13-2020/21.



Source: Greater London Authority.

Figure 11.9 The Chobham Manor development.

Source: London Legacy Development Corporation.

Around 15,500 homes have been delivered in the Opportunity Area over this period, so London is currently on track to achieve the 32,000 homes growth target that was set out in the Olympic Legacy SPG.

The increased housing growth in 2014 and 2015 is partly explained by the completion of the former Athletes' Village into the East Village, where an average of 85 homes were delivered each week over eight months (a total of 2,818 homes altogether).

Chobham Manor (see figure 11.9) was the first of five neighbourhoods being delivered as part of the Legacy Communities Scheme with around 850 homes being delivered in phases between 2018 and 2022. This was designed as a sustainable mixed neighbourhood with apartments, maisonettes, mews houses and townhouses, with priority given to maximising the number of family units.

Besides the Stratford City and Queen Elizabeth Olympic Park sites, other large sites are coming forward across the wider Opportunity Area such as the Hackney Wick Central masterplan, Chobham Farm and Sugar House Island.

Employment

Job creation underpinned by sustainable and active travel connectivity has always been central to the London 2012 Olympic and Paralympic Games legacy vision for the Queen Elizabeth Olympic Park area.

The Mayor's London Plan identifies the Olympic Legacy Opportunity Area as having potential for 65,000 new jobs by 2041. This employment vision is well underway.

On the Stratford station side (eastern side) of the park is the International Quarter London, which hosts the Financial Conduct Authority, Transport for London, UNICEF, Cancer Research UK, the Nursing and Midwifery Council, The Insolvency Service, the British Council and shared workspace facilities.

On the northwestern side of the park, just to the north of Hackney Wick station, lies the thriving innovation campus of Here East. Employers at Here East include Loughborough University London, University College London, Staffordshire University and BT Sport.

Table 11.1 gives a good understanding of the scale of employment that has either arrived at the Queen Elizabeth Olympic Park and its surrounding area or is soon to arrive, as well as the range of sectors that are coming together in this employment destination.

Table 11.1 Direct employment from planned development in the Olympic Legacy Opportunity Area.

Development	Gross total direct jobs in 2036	Sectors
Here East	7,500, including 5,300 on site	IT, technology, creative and cultural industries, information and communications, finance, real estate, professional, administrative and support, education, health, arts and entertainment, wholesale and retail, transport, other services.
Queen Elizabeth Olympic Park Legacy Communities Scheme	Circa 3,000	Business, office, wholesale and retail, transport, accommodation and food, broadcasting and communications, administrative and support, arts and entertainment, other services.
The International Quarter	26,200	Office, business, professional services, administrative and support, wholesale and retail, arts and entertainment.
Strand East (Sugar House Lane)	2,450	Business, office, retail, financial and professional services, food, leisure.
Westfield Stratford City	10,000	Retail, food, hotel, leisure and entertainment, office and professional services, administrative and support.
Chobham Farm	403	Retail and business.
Stratford Waterfront (UCL East and East Bank)	Circa 5,000	Academic institution and commercial research space, student accommodation and retail, cultural and education institutions.

Source: London Legacy Development Corporation.