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Travel in London 2025

Focus report: The Silvertown Tunnel – baseline monitoring

MAYOR OF LONDON

TRANSPORT FOR LONDON
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Travel in London 2025

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Table of contents

1. Introduction

This report provides an interpretative overview and summary of pre-opening baseline monitoring data for the Silvertown Tunnel scheme. The tunnel is a significant piece of new road infrastructure crossing the Thames in east London that opened on 7 April 2025.

This report is the first in an annual series of Travel in London Focus reports covering, in the first instance, the three-year monitoring periods either side of the opening of the tunnel, as required by the Development Consent Order (DCO) for the scheme. More detailed information relating to the monitoring of the scheme is available elsewhere and these resources are signposted throughout this report.

The baseline data contained in this report and that published more widely as part of the monitoring arrangements for the scheme will be used for comparison with equivalent data collected following the opening of the tunnel to determine the impacts of the scheme on key traffic, environmental and social/economic indicators. This report series will therefore complement and support the statutory monitoring arrangements for the scheme as set out in the scheme's Monitoring and Mitigation Strategy (MMS). This report series also sets the observed trends in the locality of the scheme in the context of wider transport-related trends in London as described in other documents in the Travel in London series and the Mayor of London's transport aims as set out in the Mayor's Transport Strategy.

Further Travel in London Focus reports dealing with conditions after the opening of the tunnel will be published at approximately yearly intervals depending on the availability of consolidated data from the different monitoring activities. Data and observations relating to the more immediate impacts of the tunnel over the first months and year of operation, including those mandated under the MMS, will be published or otherwise made available to stakeholders as they become available through the Silvertown Tunnel Implementation Group (STIG) website.

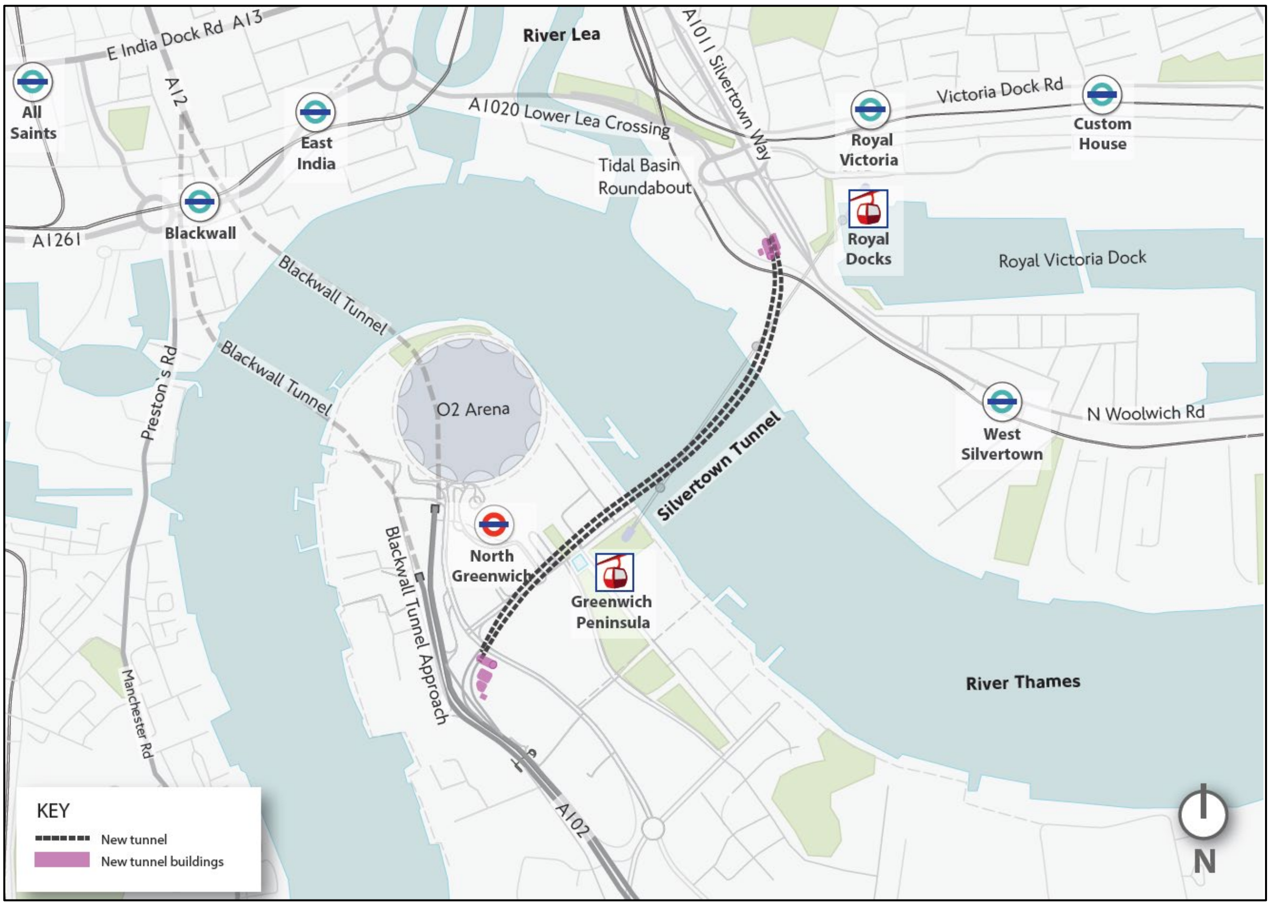
2. Summary description of the scheme and expected impacts

2.1 Overview of the scheme

The Silvertown Tunnel will connect Silvertown to the Greenwich Peninsula in east London. This new, 1.4km-long twin bore road tunnel with a dedicated bus lane was first proposed in 2012 and plans were approved by the Secretary of State for Transport in 2018. The new tunnel capacity is expected to help make the road network more reliable, cut congestion, make journeys faster for drivers and improve overall air quality around the Blackwall Tunnels.

The tunnel provides new road and public transport connectivity in this part of east London and so is expected to contribute to the wider socio-economic development of the area over the longer term. The scheme also includes improvements for walking and cycling around the tunnel entrances as part of major regeneration on both sides of the river.

Figure 2.1 Map of the area around the Silvertown Tunnel.



Source: Transport for London.

The scheme was designated as a Nationally Significant Infrastructure Project in 2012 and the DCO for its implementation was granted by the Secretary of State for Transport in May 2018. Although the new Silvertown Tunnel is the centrepiece, the scheme also involves the nearby Blackwall Tunnels and introduces a user charge for both crossings.

2.2 Key benefits of the scheme

The scheme has been designed to have a direct positive impact on local residents and businesses. It is expected that it will help to:

- Cut congestion, delays and queues on the local road network. This will make journeys faster and more reliable, with journey time savings expected to be up to 20 minutes at peak times. Before the tunnel's opening, around one million hours were lost each year to queuing from closures on the Blackwall Tunnels.
- Offer more opportunities to cross the river by public transport with an initial network of 21 zero-emission (at the tailpipe) buses per hour, during the busiest period, free to use for the first year, with new routes and better access to more places, jobs and opportunities.
- Open up access to new markets on both sides of the river for businesses. This will allow businesses to reach clients and people to access jobs more quickly and with a more reliable journey time. It will also help drive job growth in east London.
- Help manage the air quality impact of traffic congestion on some of London's most polluted roads.
- Improve the resilience of the road network by offering an alternative crossing when the Blackwall Tunnels are closed.
- Offer a new, safe cross-river cycle shuttle bus exclusively for cyclists; a high-frequency point-to-point service that will be free to use for at least one year.

2.3 Tunnel user charge

The introduction of a user charge for the new Silvertown Tunnel and the existing Blackwall Tunnels were part of the original scheme proposals first developed in 2012. The main purpose of the user charge is to help manage traffic levels and provide transport, environmental and economic benefits for residents and businesses. It will also help pay for the construction, ongoing maintenance and operation of this major infrastructure investment in east London.

Since the Silvertown Tunnel's opening, charges apply to both the Blackwall Tunnels and the new Silvertown Tunnel. Each trip through either tunnel during charging hours will be subject to a charge unless an exemption applies. Charges will apply from 06:00 to 22:00 seven days a week in both directions. The tunnel will be open 24 hours a day every day of the week.

Table 2.1 summarises the charging structure, which includes differential charges for peak and off-peak periods (directional) and for payment through Auto Pay or by other means. Note also, the charge-free overnight period and the operation of a penalty charge for non-payment.

Table 2.1 Charging structure for the Silvertown and Blackwall Tunnels, applicable from the opening of the Silvertown Tunnel.

Vehicle type	**Auto Pay peak** Mon-Fri only Northbound 06:00-10:00 Southbound 16:00-19:00	**Auto Pay off-peak** Mon-Fri other times between 06:00 and 22:00 and weekends	**Phone or online payment**
Motorcycle, moped or motor tricycle	£1.50	£2.50	£2.50
Car or small van	£1.50	£4.00	£4.00
Large van	£2.50	£6.50	£6.50
Heavy goods vehicle	£5.00	£10.00	£10.00

Source: Transport for London.
Note: No charges will apply for any vehicle between 22:00 and 06:00. | The Penalty Charge Notice (PCN) for non-payment will be £180 (reduced to £90 if paid within two weeks); maximum of one PCN per day.

Discounts, exemptions and concessions

To support residents and businesses and encourage people to use the new public transport connections there will be a package of discounts, exemptions and concessions to the user charges on the Silvertown and Blackwall Tunnels. These include:

- **Bus concessions for local residents**: For at least 12 months from the tunnel's opening local bus users will benefit from free pay as you go fares on the new cross-river bus routes serving Greenwich, Newham, and Tower Hamlets. These routes include the new Superloop SL4 and the extended route 129, which will go through the Silvertown Tunnel, as well as route 108 through the Blackwall Tunnels.
- **DLR concessions for local residents**: For at least 12 months from the tunnel's opening customers using pay as you go for journeys between and including Greenwich and Cutty Sark/Island Gardens and Woolwich Arsenal/King George V will have their fares refunded.
- **Discount for residents on certain low-income benefits**: A 50 per cent discount on tunnel charges will be available to drivers on certain benefits living in Barking and Dagenham, Bexley, Bromley, City of London, Greenwich, Hackney, Havering, Lewisham, Newham, Redbridge, Southwark, Tower Hamlets and Waltham Forest. The east London low-income residents' discount will apply for a period of at least three years from 7 April 2025.
- **Discount for small businesses and charities**: Small businesses, sole traders and charities will be eligible for a £1 discount on the off-peak charge on a maximum of three vehicles for at least 12 months from the tunnel's opening. This will only be accessible for vehicles registered with TfL on Auto Pay. The business, charity or sole trader must be registered and operate from an address within one of the boroughs of Greenwich, Newham, or Tower Hamlets.
- **Exemptions and other discounts**: There will be no charge at any time for vehicles with a disabled tax class, for taxis licensed by TfL or for zero emission-capable and wheelchair-accessible private hire vehicles licensed by TfL when carrying out a booking. DVLA-registered minibuses, buses and coaches will also be exempt. There is also a 100 per cent discount for vehicles registered for TfL's existing Congestion

Charge discounts for Blue Badge holders, roadside recovery vehicles and accredited breakdown vehicles.

User Charging Assessment Framework

The User Charging Assessment Framework (UCAF) is a framework for the assessment of how the Silvertown Tunnel, including the proposed user charges, performs against the scheme objectives and other key requirements. The UCAF has been used to inform the setting of the opening user charges and will be used for informing any subsequent variations to the charges. Any future UCAF-based assessment will be based on data arising from the monitoring programme.

3. Monitoring and evaluating baseline conditions and the future impacts of the scheme

3.1 Introduction

This section describes the overall approach to monitoring the baseline conditions before the tunnel's opening, setting the basis for evaluating the future impacts of the scheme, including the role of this report as a part of the wider monitoring and dissemination effort.

The monitoring strategy developed by TfL responds, firstly, to the statutory requirement to monitor key impacts contained in the DCO for the scheme. More widely, TfL wishes to understand the overall impacts of the scheme over the longer term, in particular how it contributes to the Mayor's aims for transport as set out in the Mayor's Transport Strategy and to inform future planning and investment. Although these are closely related, the focus of this report is the second of these priorities.

3.2 Monitoring and Mitigation Strategy

The Monitoring and Mitigation Strategy (MMS) for the scheme provides a detailed explanation of how TfL will comply with Requirement 7 of the DCO. It sets out TfL's approach to monitoring the impacts of the scheme in operation on traffic, air quality (including carbon dioxide emissions), noise and socio-economic conditions in the area affected by the tunnel. It also sets out our approach to determining and implementing mitigation for any localised and adverse traffic and traffic-related impacts which arise from the scheme.

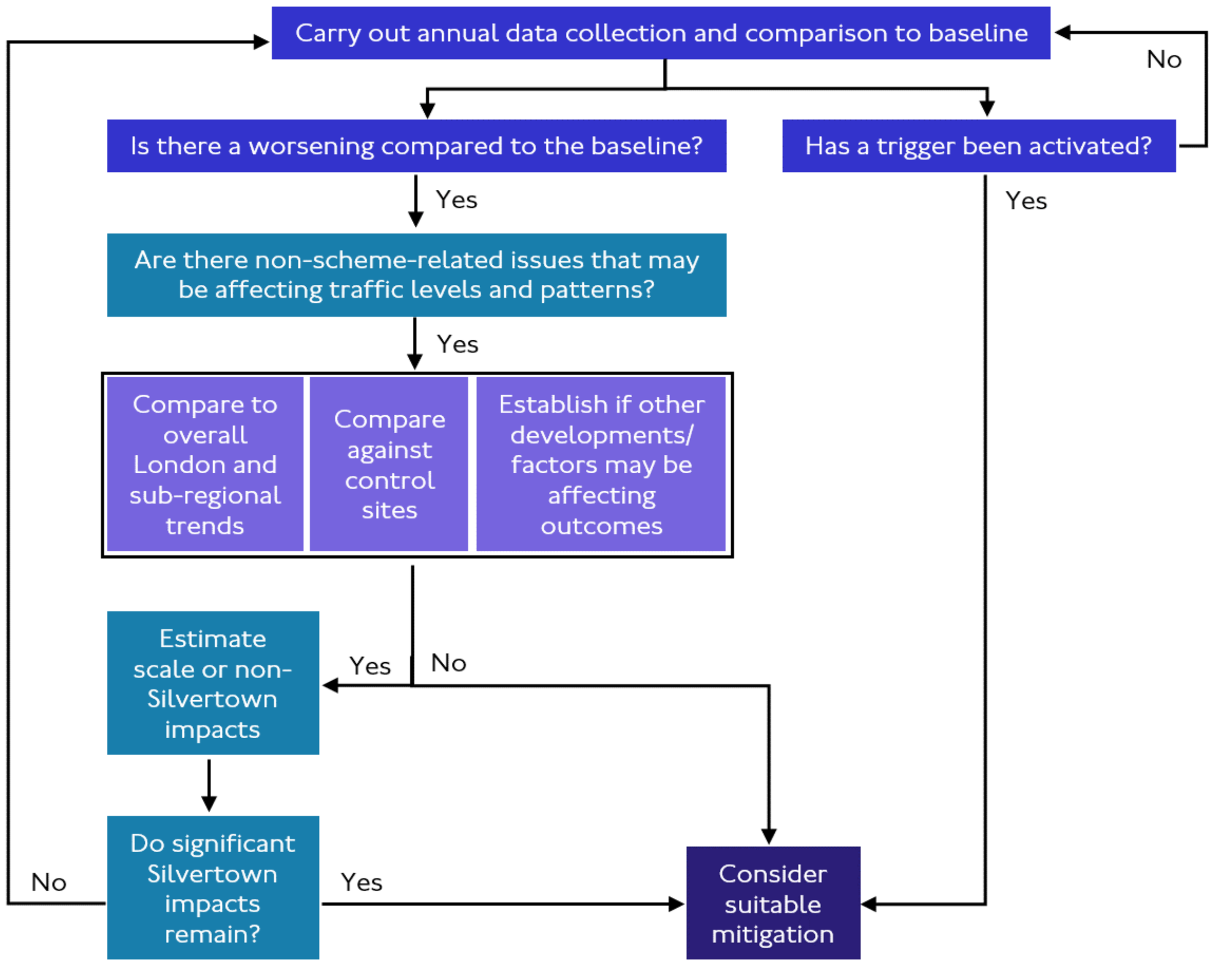
The MMS applies from no later than three years prior to the scheme's opening for public use, to secure a baseline dataset for comparison, and for three years following the scheme's opening for public use, to be compared against the baseline. There is the potential for the MMS to be extended by a further two years after the opening.

The MMS also provided for TfL to refresh its assessment of the expected impacts of the scheme prior to its opening to ensure that these were based on the most up-to-date information. This therefore provides a benchmark for the type and scale of impacts that are expected to arise as well as a basis for determining the cases under which mitigation of impacts outside of the scales expected should be considered. As well as being used to identify any post-opening mitigation requirements, the monitoring of the impacts of the scheme in operation will also be used to inform any decisions around varying the user charges. The general principles for the application of monitoring and subsequent mitigation, if required, are set out in chapter 4 of the MMS.

While early post-opening data will be available for key indicators such as traffic flows, there is an important distinction to be drawn between shorter-term incidents that may imply immediate operational issues, perhaps unrelated to the tunnel, and require operational intervention; and longer-term trends which may require mitigation. The approach that TfL is taking will ensure that any changes in trends affecting traffic, air quality and noise over a longer period will be identified and, where required (that is, if they are significantly adverse in nature), mitigations will be designed to address these issues.

Inevitably, once the Silvertown Tunnel opens there will be a period of adjustment across the local network of traffic and travel patterns. The first year of post-opening monitoring should form a long enough intensive monitoring period to ensure that short term fluctuations settle down and that any sustained changes to traffic and travel patterns can be confidently identified. Figure 2 sets out the overall approach to monitoring and mitigation for the key traffic impacts.

Figure 3.1 Approach to the monitoring and mitigation of the traffic impacts.



Source: Transport for London.

In the early stages following the tunnel's opening, TfL Network Management will be closely monitoring the tactical operation of the road network and using the tools at their disposal (for example, traffic signal timings optimisation) to manage the network and deal with any issues that arise. This will necessarily be done on a reactive, business-as-usual basis, and will therefore not form a part of formal mitigation measures. Mitigation will most appropriately apply to persistent network issues that TfL Network Management has not been able to resolve and that may require more substantial interventions (for example, physical changes to the road network). It should be borne in mind that a sufficient level of evidence over a medium-term period will be required to trigger a mitigation investigation or intervention on the network, where such a change can be tied back to the opening of the tunnel. Lags in preparing and assessing data will also need to be accommodated, particularly those relating to air quality.

3.3 Scope of the monitoring programme

The monitoring work for the scheme falls under three broad headings:

- Impacts on the local road network: changes to traffic levels and composition, delays and congestion
- Secondary impacts arising from traffic change on the road network: air quality, carbon dioxide emissions, noise and road danger
- Wider social and economic conditions and travel behaviour among residents and businesses in the catchment area of the tunnel

This monitoring is managed by TfL, using independent contracts where appropriate, and is focused on an 'area of influence' in the vicinity of the tunnel. This area was established from modelling of the impacts of the tunnel but varies as appropriate with regards to the monitoring being conducted.

Monitoring put in place specifically for the scheme will also take place in the context of wider monitoring of the above topics in Greater London (for example as provided through TfL's Travel in London series of reports and local authority monitoring programmes) and will be integrated with these where possible. This provides continuity of measurement methods and data and the facility to compare outcomes from the tunnel's local monitoring with wider trends affecting Greater London that are nominally unaffected by the tunnel.

3.4 Principles underlying the monitoring programme

The MMS states that the traffic, environmental and socio-economic monitoring shall comply with the following principles:

- Monitoring shall describe and characterise the main effects of the scheme in operation, through comparison with baseline data collected prior to the opening
- Monitoring shall enable unexpected or unanticipated effects to be identified
- Monitoring shall seek to understand as well as to measure the wider potential effects by employing a range of quantitative and qualitative research techniques in a complementary manner to enable a comprehensive understanding of the scheme's wider potential effects, including on travel behaviour.
- Monitoring shall be appropriate and proportionate to the expected scale, extent and importance of the expected impacts.

As well as these statutory requirements, TfL wishes, over time, to achieve a rounded understanding and evaluation of the impacts of the scheme, and this is the primary focus of these (annual) Travel in London Focus reports.

3.5 Timing of the monitoring programme

As mandated by the DCO for the scheme, the monitoring programme commenced (a minimum of) three years prior to the expected date of the scheme's opening and will continue for three years after the opening. The duration of the post-opening monitoring will be reviewed, and TfL will consult with the STIG on whether it is appropriate to extend this period by up to an additional two years.

The monitoring programme is time-limited because the most significant effects are expected to materialise within around a year of the scheme's opening and it will become increasingly difficult to distinguish the effects of the scheme from other projects over time. Following the three-to-five-year monitoring after the opening the collection of monitoring data will revert to TfL's business-as-usual monitoring programme. The data collected in the three years prior to the opening of the scheme forms the baseline against which a comparison will be made following implementation.

Although traffic, air quality and social economic conditions in the vicinity of the tunnel have generally been unaffected by the tunnel itself in the baseline monitoring period, there have been several factors potentially affecting the baseline that need to be recognised in the subsequent interpretation and comparison. These are:

- Localised construction-related impacts during the baseline period, for example temporary road closures.
- London's recovery from the coronavirus pandemic, particularly affecting general travel behaviour and some aspects of the local economy. These factors have been extensively documented in other Travel in London reports.
- Wider trends and policies affecting traffic, air quality and social and economic wellbeing, for example the ongoing implementation of the policies and proposals contained in the Mayor's Transport Strategy, specific policies particularly affecting air quality such as the Ultra Low Emission Zone and general economic trends.

3.6 Geographical coverage of the monitoring programme

Within the context of business-as-usual monitoring activity undertaken by TfL and others throughout Greater London, the monitoring for the scheme will cover an area of sufficient spatial scope to fully capture the expected material impacts of the scheme in operation.

The basic monitoring area identifies an area of influence where the changes associated with the scheme are expected to be most marked. This covers the majority of the three host boroughs (Greenwich, Newham and Tower Hamlets), the three nearest adjacent river crossings (Woolwich Ferry, Rotherhithe Tunnel and Tower Bridge), and parts of other boroughs in the vicinity of the scheme where impacts are reasonably foreseeable. Outside this envelope, within the wider 'buffer zone', the scope of the monitoring will vary for each topic depending on the scale and location of the expected impacts.

It is important to note that scheme-specific monitoring will take place in the context of the wider monitoring programmes of TfL and others, therefore potentially extending the reach of the monitoring spatially and providing data for comparator locations outside the area of influence of the tunnel. It is also important to note that some impacts, for example ambient noise, are only expected to be relevant very locally. The monitoring is therefore flexible and can be adapted should it be considered necessary, for example in consultation with STIG, to address unforeseen impacts that might arise later.

The following sections provide a brief overview of the activities that have been put in place for each of the main monitoring workstreams. Further details are provided in the appropriate sections of this report.

3.7 Silvertown Tunnel Implementation Group

The Silvertown Tunnel Implementation Group (STIG) is a consultative body set up under the terms of the DCO. It consists of representatives from adjacent local and highway authorities and the Greater London Authority. TfL is required to consult with the STIG on matters related to planning and operating the Silvertown Tunnel scheme, including the MMS.

The STIG web pages will be the primary means of disseminating information about the monitoring and emerging trends following the scheme's opening. Prior to opening, contractor baseline reports (prepared by TfL's contractors) were published setting out pre-opening conditions across the three key monitoring workstreams (traffic conditions, environmental impacts and social and economic conditions) covering the required three-year pre-opening monitoring period. These will be followed by similar reports reflecting post-opening conditions. These reports form the basis for the material that is summarised here. Further details of the role of the STIG and the full range of documents relating to monitoring and mitigation can be found on the STIG webpage.

3.8 Monitoring workstreams

This section summarises the main elements of each of the monitoring workstreams.

Road traffic and road network performance (core metrics)

By providing new road network connectivity the scheme will affect traffic flows in the local area (both traffic volumes and other characteristics, such as average speeds). In turn, these traffic changes may give rise to impacts on air quality, carbon dioxide emissions and traffic noise.

These potential impacts have been extensively studied and forecast as part of the modelling work for the scheme. The potential impacts of the scheme on road traffic are therefore well understood and generally expected to be modest in scale, given that the Silvertown Tunnel provides additional capacity in a road network that, so far as river crossings are concerned, is currently capacity constrained. The user charge associated with the scheme provides an additional means of moderating traffic change and, should it be needed, a means to address any adverse features that emerge after the opening.

The core traffic monitoring falls under three headings:

- Traffic demand on the road network (that is, traffic volumes)
- Journey times
- Junction delay

Data for each of these arises from an overlay of scheme-specific traffic monitoring that has been set up as an integral extension of TfL's network-wide traffic monitoring work.

Cycling, public transport, road danger, carbon dioxide and ambient noise

As well as potentially affecting traffic flows in terms of vehicle numbers, vehicle mix and delays/congestion, the road network changes arising from the scheme will also have implications for public transport, road danger and emissions of carbon dioxide and ambient noise from road traffic.

New **bus services** introduced in conjunction with the new tunnel will therefore be monitored both in terms of customer demand and their operational performance, for example service reliability, this being potentially affected by changes in road network congestion.

Road danger refers to the number and type of casualties resulting from road collisions. The Mayor's overall approach to this is set out in the Vision Zero Action Plan, along with related targets. Progress towards these targets is regularly monitored and reported through our Road safety data webpage. In terms of the scheme, changes in the number or type of casualties recorded in the vicinity of the tunnel will therefore provide a longer-term indication of the impact on road danger.

The new connectivity provided by the tunnel also gives the opportunity to enhance facilities for people making cross-river trips by **cycle**. Demand on the new cycle shuttle bus through the Silvertown Tunnel will therefore be closely monitored from the opening, the early emphasis being on understanding the relationship between the capacity provided and the use that is made of it. Wider cycle monitoring, as part of TfL's business-as-usual arrangements, will also look at changes to the number and routeing of people cycling in the vicinity of the tunnel and on nearby river crossings.

Carbon dioxide (CO_2) emissions from road traffic will also be estimated as part of the monitoring programme. As carbon dioxide is a greenhouse gas, it has an impact on a global scale, rather than producing any measurable adverse localised impacts. As such, the scheme's impact on carbon dioxide must be assessed (calculated) at a total emissions level. This will be done using the traffic flow data generated as part of the monitoring.

Any **noise** impacts from the scheme in operation will be a function of change in traffic volumes, which provide a first means of assessing these impacts. The nature of the relationship between traffic and ambient noise is such that changes of the order of plus or minus 25 per cent in traffic flow would be required to exceed the perception threshold for a change in ambient noise. Prior to the start of construction activity associated with the scheme TfL undertook baseline noise monitoring for 12 months in 2019/20. The monitoring was limited to the area around the tunnel portals, reflecting the limited extent of impacts expected. This measurement will be replicated after the tunnel's opening and comparisons made with the 2019 pre-construction baseline.

Air quality

In the context of wider high-quality air quality monitoring undertaken by the London boroughs, Defra and others across London, specific additional monitoring capacity has been put in place by TfL in relation to the scheme. This includes a comprehensive network of diffusion tubes and three new continuous automatic monitors.

The air quality monitoring will measure nitrogen dioxide (NO_2). The Environmental Impacts Report indicates that the scheme is expected to have a negligible impact on particulate emissions in the vicinity of the tunnel.

NO_2 monitors (diffusion tubes or permanent monitors) have been sited:

- Where the scheme is forecast to bring about a change in air quality in excess of $0.4 \mu g \cdot m^{-3}$ and annual mean concentrations were above the National Air Quality Strategy (NAQS) objective values
- Where the scheme could lead to traffic diverting to alternative routes
- To ensure that monitoring locations are representative of relevant exposure at sensitive receptors

A greater-than-three-year baseline has been achieved for this aspect of the monitoring, although data are subject to three principal limitations:

- The first is that the NAQS objective values are based on annual averages, meaning that part-year data cannot be taken as a definitive guide to annual values
- Second, data is subject to lengthy validation and ratification procedures which are industry standard
- Third, local ambient air quality reflects both other local emissions sources, such as industrial activity and seasonal and weather-related factors. This means that it will take longer to have a meaningful understanding of air quality impacts in comparison to the immediate availability of data on traffic levels. The latter will potentially, however, provide an early warning of any adverse change.

Social and economic impacts

In the four years before the tunnel's opening (2020-2024), TfL collected and collated socio-economic data on an annual basis (excepting the year 2022). This included analysing secondary data related to business activity and employment, as well as collecting representative primary data on cross-river movement by residents and businesses through cross-sectional surveys. This will provide the baseline for comparison with similar data collected after the opening, also to be collected annually. The geographical scope of the monitoring needs to be sufficiently large to fully capture the discrete socio-economic impacts of the scheme and therefore includes the local authorities where impacts are expected to be most significant.

During the baseline period, primary surveys of businesses focused on the following aspects:

- Business location: positive and negative aspects and longer-term plans
- Business health and issues affecting business performance
- Cross-river travel: by customers, for business trips and for deliveries
- Factors affecting cross-river travel, such as performance of the road network
- Awareness of the new tunnel and planning for it
- Longer-term impacts of the tunnel on local business composition and performance

Primary surveys of residents focused on the following topics:

- Cross-river travel in detail: mode, journey purpose, frequency, etc.
- Change in travel over the most recent year and reasons for this, such as employment or changed transport availability
- Impact of new cross-river connectivity on social and economic wellbeing
- Impacts of the scheme for specific socio-economic groups

This information will also be supported by similar information from TfL's London Travel Demand Survey (LTDS) which, although limited by sample size for local area studies, does benefit from a lengthy time series and an ability to compare behaviour change directly across all parts of Greater London.

Secondary data will be used to provide interpretative context and, where applicable, given the lengthy update cycles for some indicators, to help assess the social and economic impacts of the scheme over the longer term. Available indicators include:

- Demographic indicators, such as from the decennial census of population
- Business population and structure (for example, employees)

- Employment and unemployment statistics
- Business rents and turnover
- Indices of multiple deprivation and other indicators of social and economic wellbeing

3.9 Timescales for the emergence and reporting of impacts

TfL's arrangements for the reporting of the results from the monitoring work reflect the following:

- The formal statutory requirements as set out in the MMS, including the formal assessment of triggers for mitigation
- The timescales over which impacts are expected to emerge and be quantified as well as the dissemination methods appropriate to this, especially in the months immediately following the tunnel's opening
- The timescales appropriate to third-party contractor reporting of the details of each of the monitoring workstreams (generally annually)
- The need for a consolidated overview of scheme impacts, evaluating and synthesising data across all monitoring workstreams (generally annually)

Baseline data collection has now been completed and, where available in collated form, published, meeting the three-year pre-opening requirement. Monitoring of key elements (traffic and air quality) will be continuous across the tunnel's opening period, providing an uninterrupted comparison. Annual third-party contractor baseline reports (traffic, air quality, noise, social and economic impacts) can be found on the STIG pages. The carbon dioxide baseline will be calculated directly from the traffic baseline (that is, a complete dataset of this is required prior to calculations being undertaken) and will therefore be described in future reporting. Other key elements, for example public transport change, the cycle shuttle bus and performance of the user charging regime do not have specific pre-opening baselines and will be assessed in the early period after the opening.

Following the tunnel's opening, the following broad reporting principles are expected to apply:

- For the first year after the tunnel's opening, TfL will produce and submit to the **STIG Interim Monitoring Reports** on a quarterly basis to help ensure that any impacts can be identified and considered promptly. These reports will include data collected to date and a high-level analysis of the results.
- **Third-party contractor reports** for each of the monitoring workstreams will continue to be produced and published on an annual basis, although the timings of these will not be synchronous across the year nor will they be available in fully published form until a sufficient time has elapsed (to allow for report preparation).
- TfL will produce **Annual Monitoring Reports** of the impacts of the scheme and will present these to members of the STIG for review. The reports will enable the impacts arising as a direct effect of the operation of the scheme to be identified. The annual monitoring reports will include key data to date, appropriate comparisons with baselines and a level of commentary and interpretation that will allow the emerging impacts of the tunnel arising as a direct effect of the operation of the scheme to be identified. These reports will be produced by TfL and provided to the STIG members within two months of data collection, whereupon the STIG will review. The STIG will consider the need for and type of any mitigation measures that might be required to

address scheme impacts and make recommendations to TfL for changes where appropriate.

- Annual **Travel in London Focus reports** (this report) will be produced to a broadly annual timescale, allowing for the consolidation of outputs across the monitoring workstreams. They will provide an interpretative summary of the overall impacts of the tunnel. They will be for general publication and will set the emerging impacts of the scheme in the context of wider trends and developments affecting travel in London and in the context of the Mayor's Transport Strategy aims. These reports are not specifically mandated by the MMS and are therefore additional to it.

Further details of the expected programme for the availability of post-opening monitoring data are provided in the 'forward look' sections for each of the workstreams below.

3.10 Availability of consolidated baseline data

Reflecting data collation and publication timescales, this report includes baseline data up to the later months of 2024 only. Data collection will continue uninterrupted over the opening period in early 2025. In cases where no or only partial baselines are available, guidance as to the status and location of potentially relevant data is given in the appropriate sections of this report. Table 3.1 summarises the coverage of this report and the key sources and limitations applying to each baseline.

The following sections provide an overview of the monitoring activities and baselines for each of the key monitoring workstreams.

Table 3.1 Topics covered in this report and main applicable limitations.

Topic	Level of coverage in this report and key sources	Key applicable limitations
Road traffic (all aspects)	Comprehensive summary. Contractor report published on STIG website.	Early 2025 pre-opening data not available at the time of writing.
Bus network changes (patronage and performance)	Summary of approach only, with illustrative baseline. TfL internal monitoring.	The lack of pre-opening baseline reflects primary interest in new bus routes. Relevant baseline data available from TfL's business-as-usual monitoring.
Cycling	Summary of approach only, with partial baseline. TfL internal monitoring,	The lack of pre-opening baseline reflects primary interest in the new cycle shuttle bus. Relevant other baseline data available from TfL's business-as-usual cycle monitoring.
Road danger	Summary of approach only. Casualty statistics publicly available.	Late 2024/early 2025 data not available at the time of writing.
Local air quality	Comprehensive summary. Contractor reports published on STIG website.	Consolidated data for 2024 and early 2025 not available at the time of writing.
Carbon dioxide emissions	Baseline not yet available. Summary of approach only. TfL internal monitoring, based on traffic data.	Dependent on the availability of consolidated road traffic data and the subsequent calculation time required.
Ambient noise	Summary of approach only. Contractor report published on STIG website.	Unwieldy nature of the baseline data means that reference is best made to the contractor reports covering this.
Social and economic impacts	Comprehensive summary. Contractor reports published on STIG website.	Social and economic impacts are longer-term and subject to external trends.
Tunnel user charge	Summary of approach and traffic baseline for the Blackwall Tunnels. TfL internal monitoring.	Tunnel charges do not apply in the pre-opening period.

Source: Transport for London.

4. Traffic volumes and road network performance

4.1 Introduction

By introducing new options for cross-river travel by road, the new Silvertown Tunnel is expected to affect both traffic volumes and speeds/congestion/junction performance on the local road network. In turn, this could affect wider conditions such as local air quality or the bus network's performance.

In the period immediately following the opening of the new Silvertown Tunnel, traffic monitoring will be primarily focused on operational refinement of the local road network in response to observed changes, for example optimising traffic signal settings. Over the medium term, it will be focused on identifying any more persistent issues or changes and considering whether these require mitigation under the arrangements provided for in the scheme's MMS. These Travel in London Focus reports will take a longer-term and more contextualised perspective of traffic change in response to the scheme.

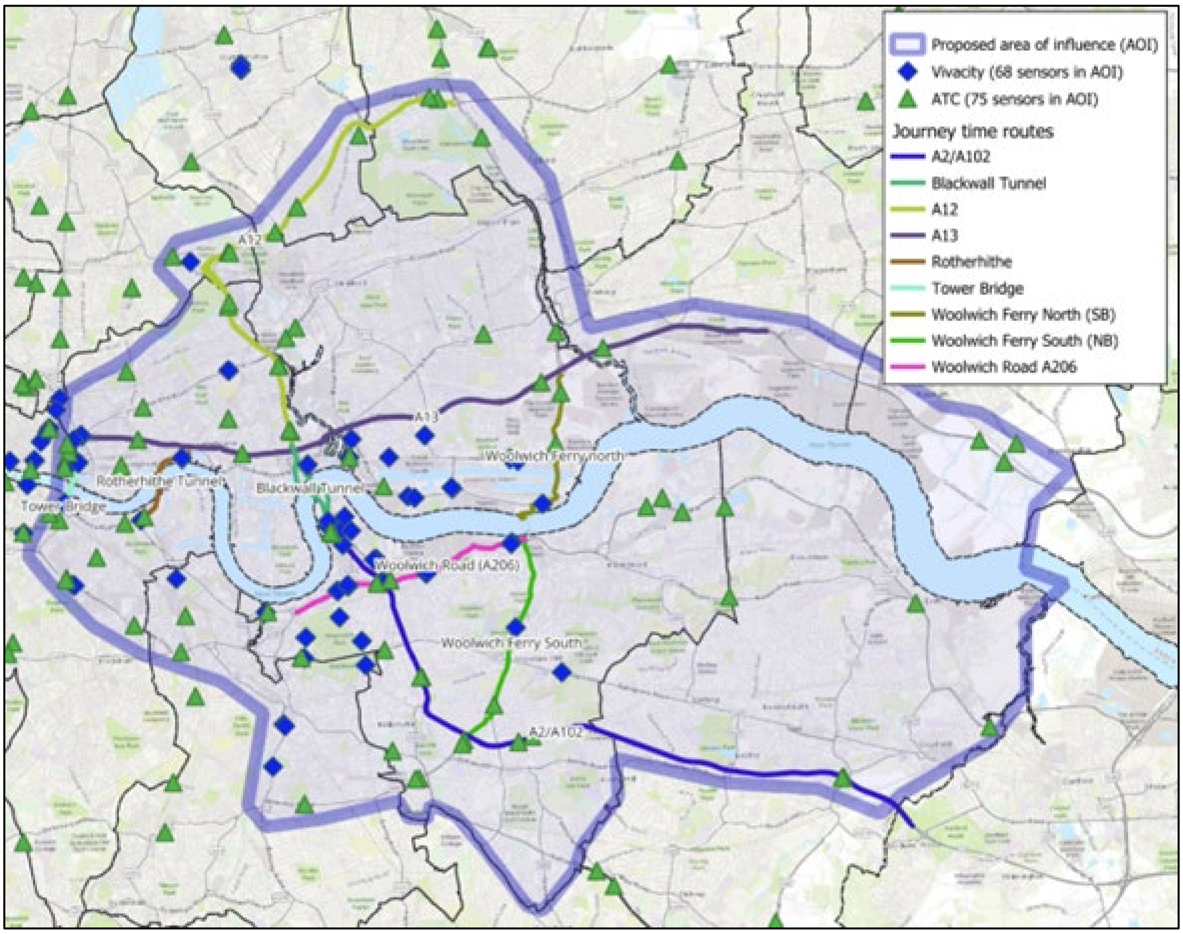
The material below therefore illustrates the main elements of the three-year consolidated baseline for assessing post-opening traffic change, using late 2024 as a pragmatic cut-off. The nature of the scheme is such that, barring short-term impacts related to the construction itself, the baseline will have been unaffected by the new Silvertown Tunnel and will therefore reflect representative pre-opening conditions. The baseline can therefore also be expected to reflect non-tunnel-related trends affecting traffic in London more widely.

4.2 Area of influence for traffic impacts

The scheme can be expected to affect road traffic flows on the local road network (especially on roads leading to the new Silvertown Tunnel), on the parallel Blackwall Tunnels and more widely across the host boroughs. For impacts monitoring, an area of influence has been defined within which traffic monitoring is focused (figure 4.1). This has been defined with reference to:

- Notable changes in traffic flow attributable to the scheme as forecast in the Revised Assessment. This broadly equates to an area bounded by Tower Bridge to the west; the A11, A12, A406 and A13 to the north; the Dartford Crossing to the east; and the A2 to the south
- Ensuring full coverage of the host boroughs: Greenwich, Tower Hamlets and Newham
- Locations identified as monitoring sites during prior engagement with other STIG members

Figure 4.1 Silvertown Tunnel traffic monitoring area of influence.



Source: Jacobs, on behalf of Transport for London.

Within this area, the following traffic counting resources are available:

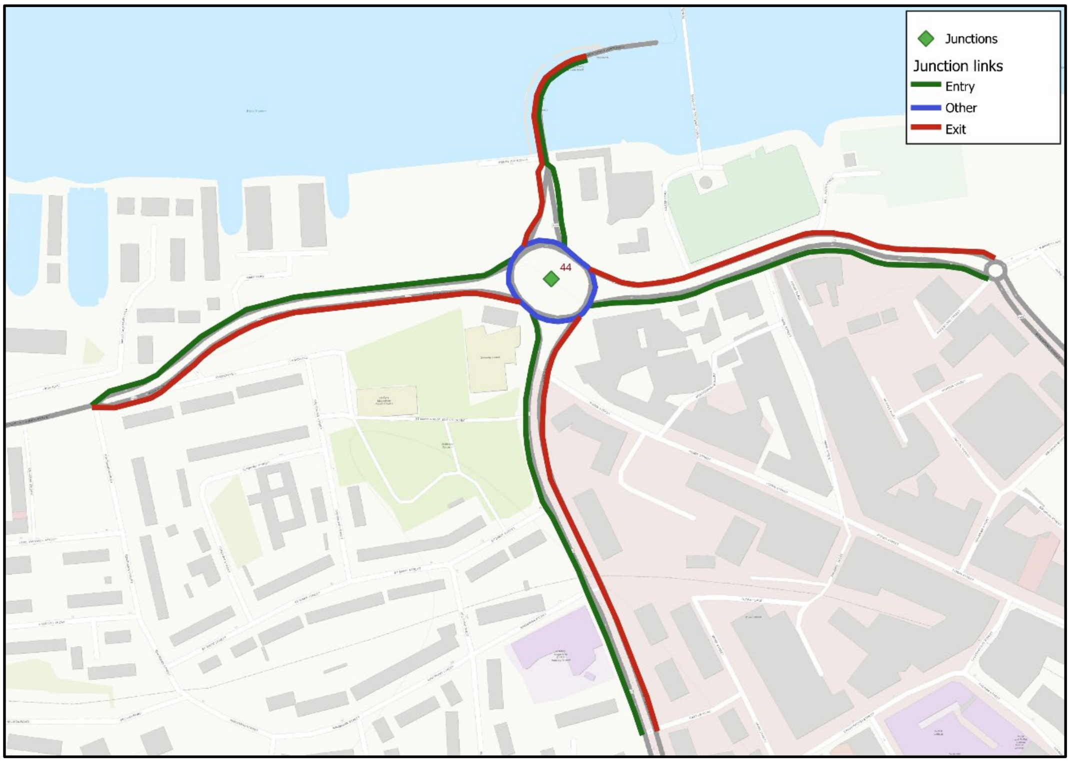
- 68 Vivacity-type traffic sensors (video-analytics based). These provide a comprehensive breakdown in terms of vehicle type (body plan) passing the sensor location
- 75 pneumatic tube/inductive loop-type automatic traffic counters. These are used in this context primarily to quantify total volumes of traffic at counter locations

Both can be used in conjunction to provide continuous counts of traffic passing monitored locations, classified by vehicle type (if applicable). This can be extrapolated to road link level, giving coverage of the main road network in the area and allowing the estimation of indices such as total vehicle kilometres travelled.

Road vehicle journey time data has been sourced from INRIX, a traffic data analytics company. INRIX collects traffic data from GPS trackers installed in a large fleet of private vehicles operating on the road network. This data has been processed in terms of TfL's Common Operational Road Network (CORN), meaning that comprehensive journey time data is available for most of the significant roads in the area of influence.

INRIX data is also used to assess junction conditions and performance based on disaggregate analysis of CORN links that comprise them. An example of this approach is shown in figure 4.2.

Figure 4.2 Example of approach to disaggregating the analysis of junction performance based on CORN links.



Source: Jacobs, on behalf of Transport for London.

TfL's business-as-usual traffic monitoring throughout Greater London uses similar technologies and remains available for areas outside the area of influence if required or for wider comparison/control purposes.

4.3 Comparator areas and averaging periods for traffic impacts

There is no single formal control area against which traffic trends in the area of influence will be compared to following the scheme's opening. This is primarily because the heterogeneity of London means that similar areas unaffected by the tunnel cannot readily be identified, but also because of the facility provided by TfL's wider traffic monitoring to make a series of different comparisons as appropriate to the matter under consideration.

Comparator traffic metrics which may be appropriate include aggregated borough flows, aggregated inner/outer/Greater London flows and flow changes by road corridor type, for example TfL Road Network corridors. These comparisons will help TfL assess whether localised traffic change is primarily due to the impacts of the scheme or whether it partly reflects other non-local factors.

For the purposes of the short-to-medium-term tactical monitoring and mitigation it will be important to capture the full variation in traffic conditions across the day and the week. The monitoring that has been put in place can provide this detail but there are many short-term factors that can affect traffic levels and the road network's performance (for example, seasonality) that are not relevant to the emerging longer-term picture. This report therefore presents a high-level illustrative summary of the data, generally based on annualised weekday trends or averages initially over the approximately 2.5 years of available baseline data available at the time of writing.

4.4 Baseline traffic demand (volume) trends

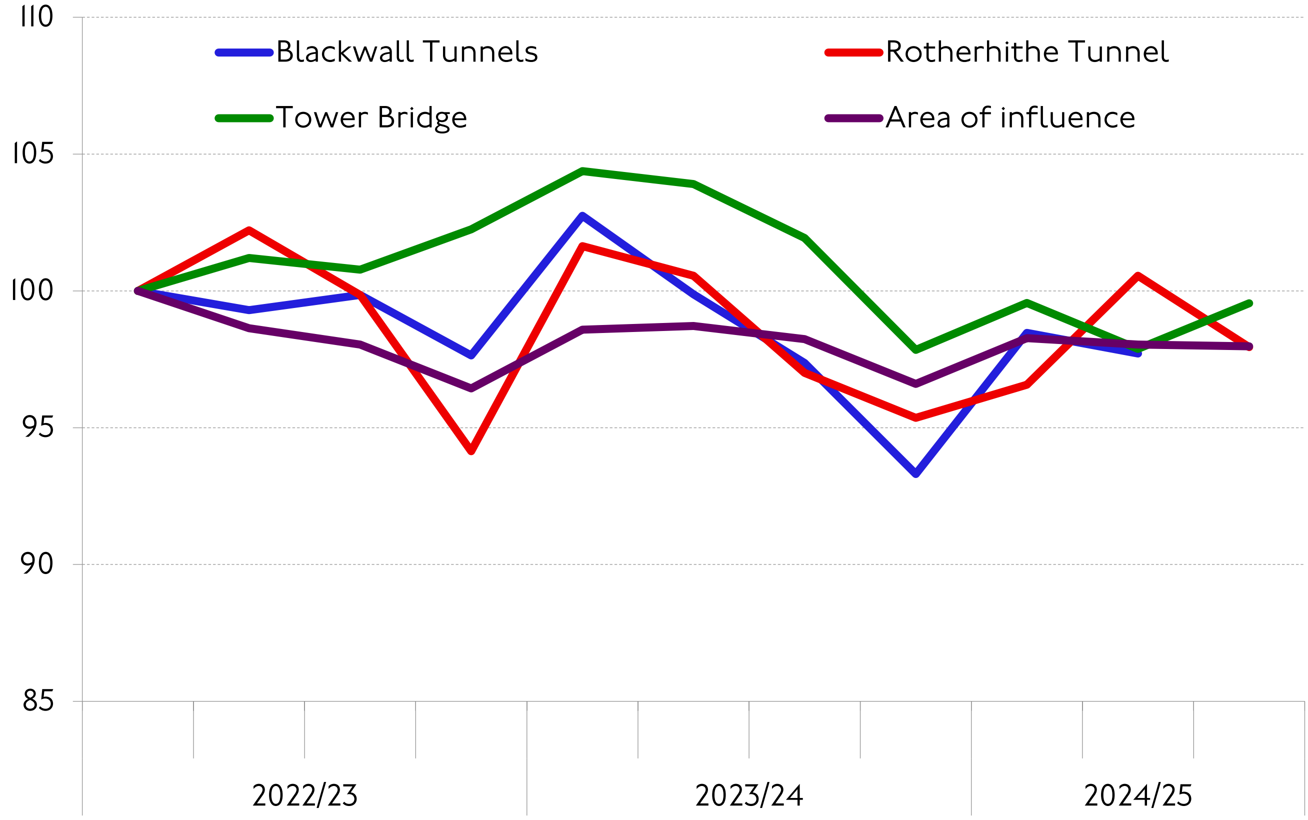
Baseline traffic volumes are illustrated under the summary headings below, providing a basis for both a comprehensive and more detailed evaluation of traffic volume change in relation to the scheme.

The disaggregate nature of the traffic dataset means that it is possible to perform a wide range of potential comparisons, of which the following are examples. Unless stated otherwise, the comparisons below are based on 24-hour combined direction flows from Tuesdays to Thursdays only, reflecting the times of highest demand on the road network.

River crossings

Figure 4.3 shows the baseline traffic trend at the three nearby pre-existing river crossings: Tower Bridge, the Rotherhithe Tunnel and the Blackwall Tunnels. The index base period is April to June 2022. Missing data does not allow an indexed flow to be calculated for the Blackwall Tunnels in October to December 2024. An equivalent trend for all sites within the area of influence is also shown for comparison.

Figure 4.3 Change (index: April to June 2022 = 100) in the weekday (Tuesday to Thursday, term-time) bidirectional traffic flow at selected river crossings and in the area of influence as a whole, by quarter, from April to June 2022 until October to December 2024.



Source: Jacobs, on behalf of Transport for London.

Total traffic volumes at the three crossings followed a similar pattern over the baseline period, with the lowest average flows typically recorded in the fourth financial quarter of each year (January to March). There was also a slight downward trend over the monitoring period, with traffic flows in the first quarter (April to June) across the three crossings reducing by an average of 2.5 per cent between 2022 and 2024.

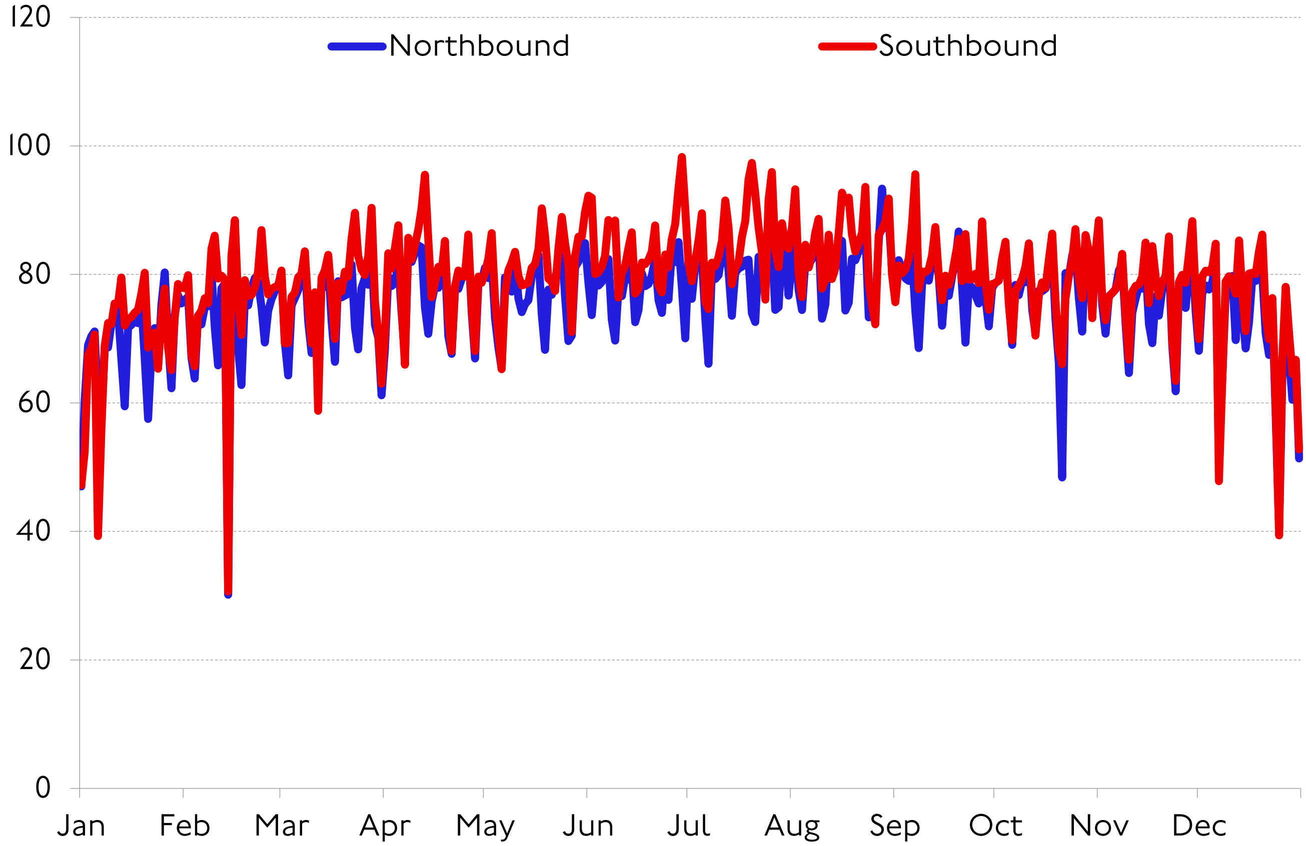
A pronounced drop in traffic flows on the Rotherhithe Tunnel was evident in the last quarter of 2022/23 (January to March 2023), with flows increasing across Tower Bridge in the same period suggesting some demand shift between the two crossings.

A broadly similar trend was seen across the whole of the area of influence, although Tower Bridge flows showed some variation from the overall trend.

In the post-opening period, the equivalent traffic demand trend through the new Silvertown Tunnel can be added to the comparison as a first step to interpreting cross-river traffic flow change at all adjacent crossings in response to the new tunnel.

More widely, the new tunnel could potentially also affect traffic volumes at the Dartford Crossing. Figure 4.4 shows the daily (24 hours) flow at this crossing by direction, with typically around 160,000 vehicles crossing daily in both directions on a visible seasonal pattern. Changes to the mix of vehicles using this crossing will be of particular interest following the opening of the new Silvertown Tunnel.

Figure 4.4 Daily (24 hours) traffic flow (in thousands) on the Dartford Crossing, by direction, 2024.

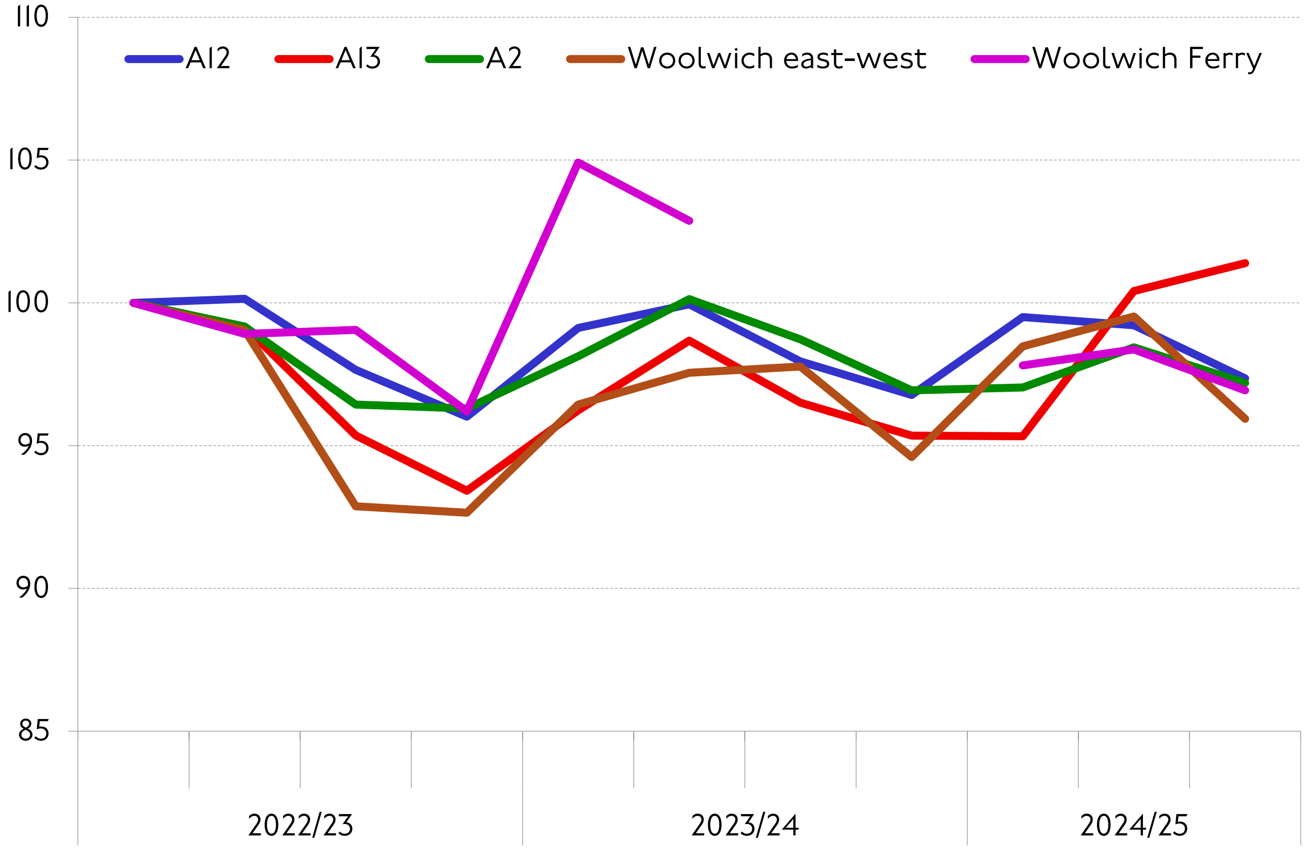


Source: National Highways.

Principal road corridors within the area of influence

Traffic monitoring sites can also be grouped to monitor change in traffic flows along principal corridors within the area of influence. Figure 4.5 shows trends for five such corridors over the available baseline period. It can be seen that, except for the expected seasonal variation, kilometres travelled along all corridors were broadly stable over the baseline period.

Figure 4.5 Change (index: April to June 2022 = 100) in the average weekday (Tuesday to Thursday, term-time) kilometres travelled on selected corridors in the area of influence, by quarter, from April to June 2022 until October to December 2024.

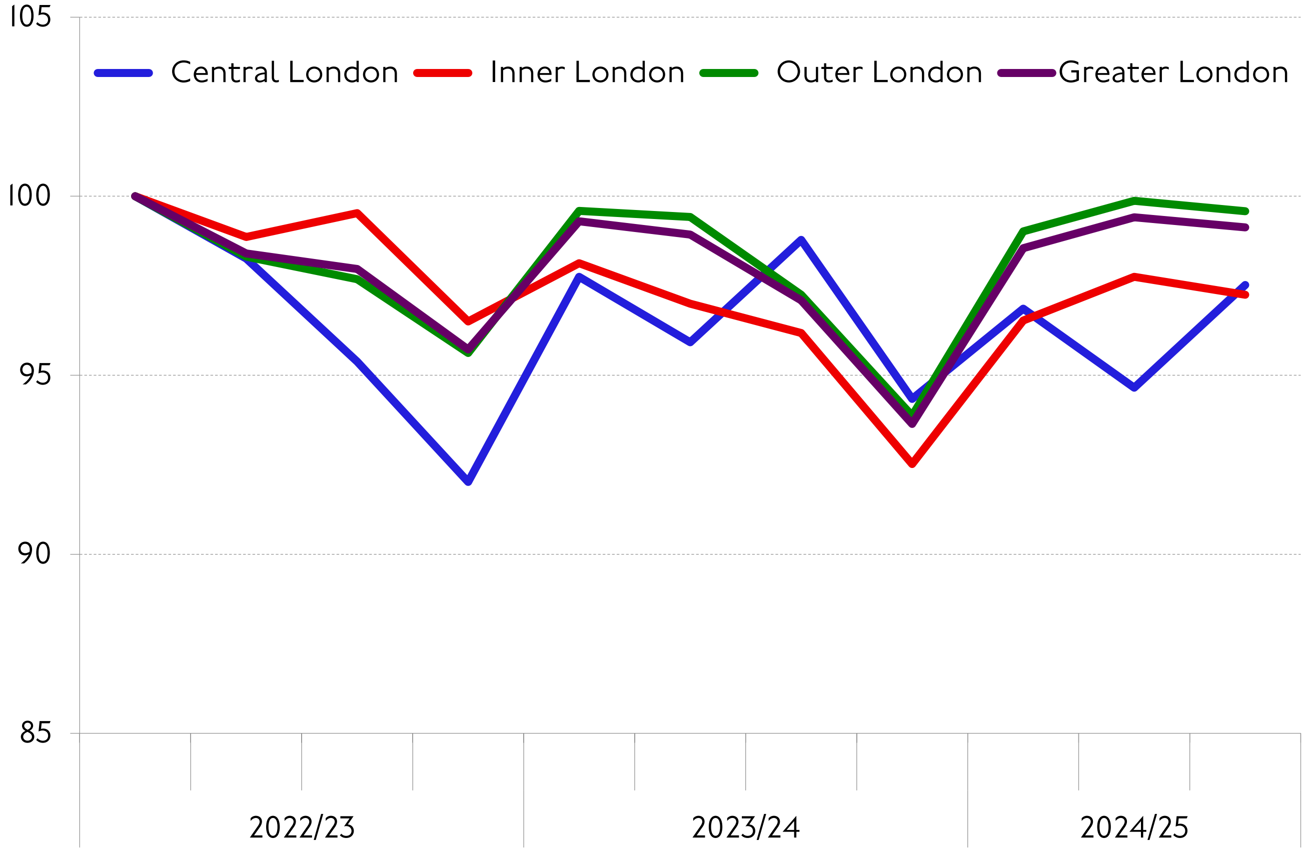


Source: Jacobs, on behalf of Transport for London.

Comparison areas

For comparison, figure 4.6 shows indexed average 24-hour traffic flows for all monitoring sites in central, inner, outer and Greater London. These indicate similar demand patterns to the river crossings and the sites within the area of influence, with traffic demand declining by around 2.5 per cent over the monitoring period in central and inner London and a lower level of reduction observed in outer London.

Figure 4.6 Change (index: April to June 2022 = 100) in the weekday (Tuesday to Thursday, term-time), bidirectional traffic flow at all traffic monitoring sites in London, by area and quarter, from April to June 2022 until October to December 2024.



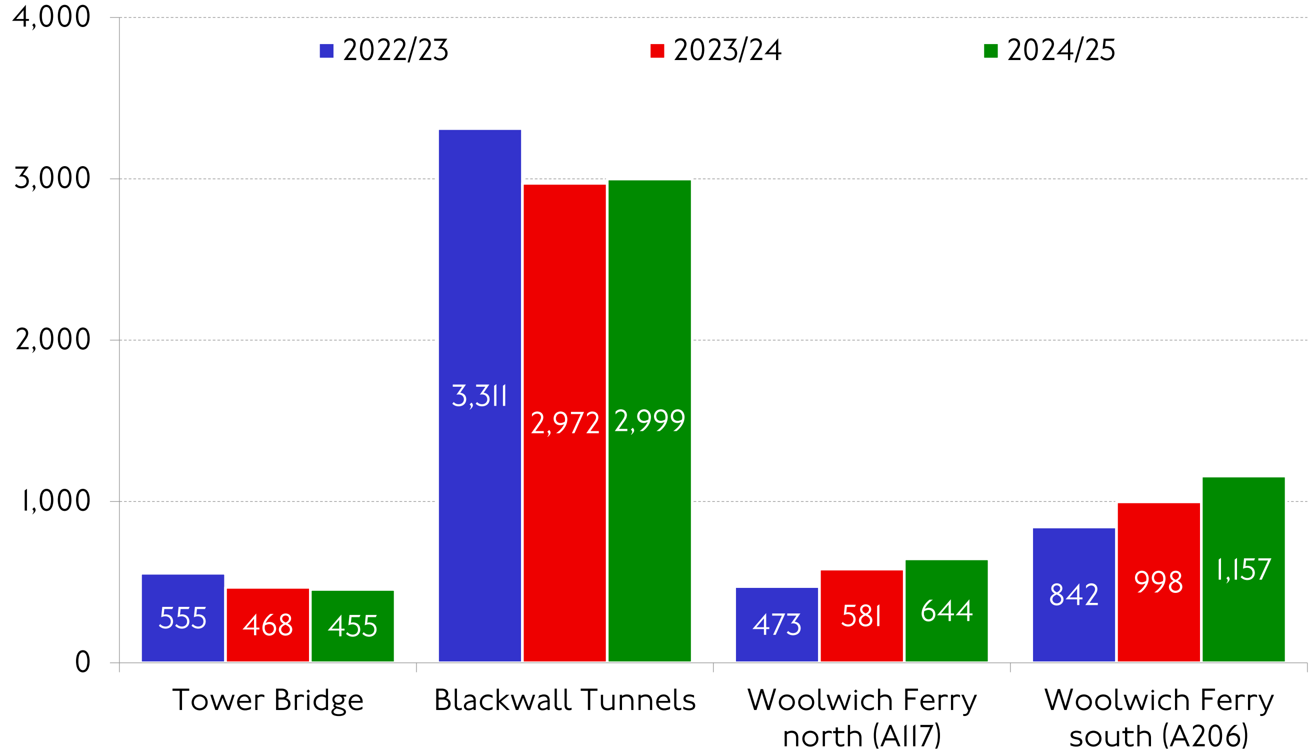
Source: Jacobs, on behalf of Transport for London.

The trend of slowly declining traffic volumes is consistent with the pattern observed and commented upon in Travel in London 2024 - Annual overview report, reflecting the broad effect of the implementation of the policies in the Mayor's Transport Strategy. This report also showed that the full recovery from the coronavirus pandemic occurred at an earlier stage for road traffic compared to public transport. This was at a slightly lower level of traffic than before the pandemic and the declining trend shown in the baseline should therefore be interpreted as a post-pandemic effect rather than a legacy of the pandemic itself.

Heavy goods vehicle (HGV) demand trends at river crossings

HGV flows will be of particular interest because of their larger traffic and environmental impacts. Figure 4.7 shows HGV flows at existing river crossings. It should be noted that HGVs are prohibited from using the Rotherhithe Tunnel, are restricted at the Blackwall tunnels and that the Dartford Crossing is a major crossing point further downstream. HGV flows through the new Silvertown Tunnel can be added after opening and comparisons made with flows on these alternative crossings.

Figure 4.7 Heavy goods vehicle weekday (Tuesday to Thursday, term-time) bidirectional flow at selected river crossings, by financial year, from 2022/23 until 2024/25.



Source: Jacobs, on behalf of Transport for London.
Note: The Woolwich Ferry flows relate to the nearby roads in brackets rather than the crossing itself.

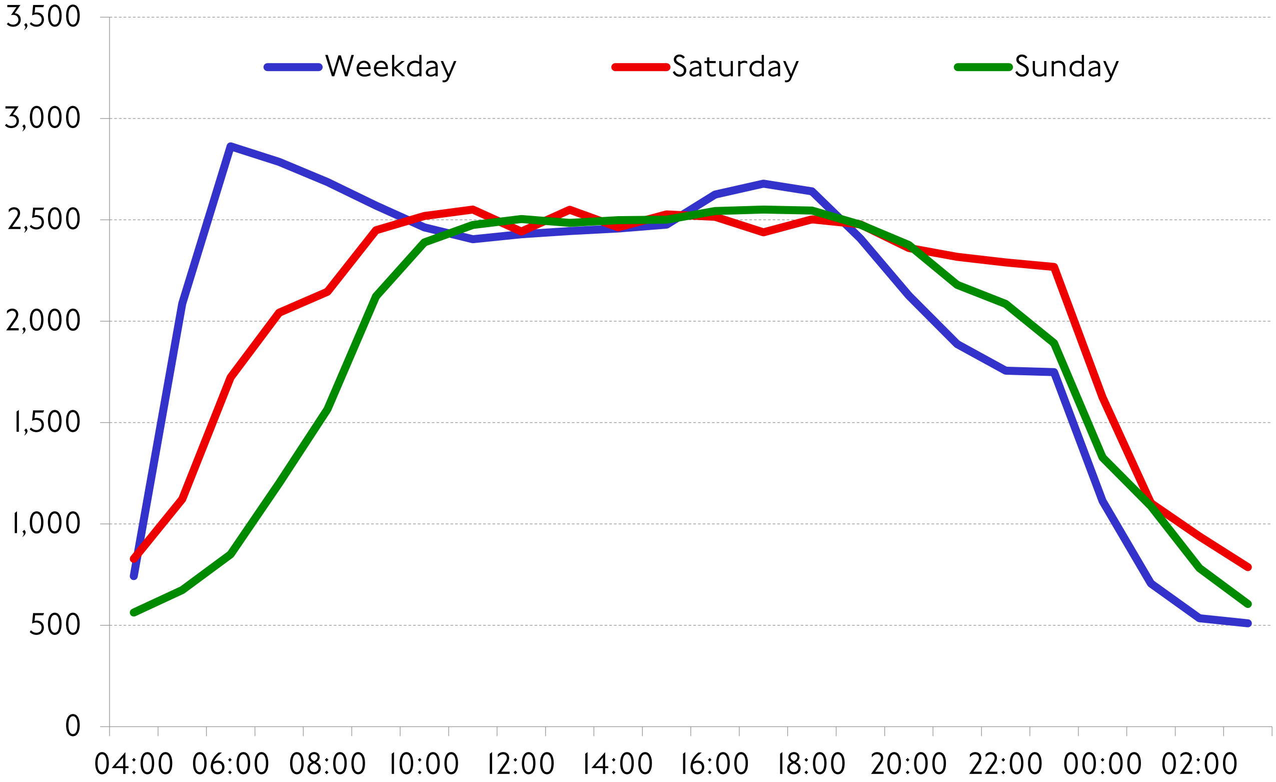
The Blackwall Tunnels were the predominant cross-river route for HGV traffic in the baseline period, carrying an average of 3,000 HGVs per weekday. In contrast, around 500 HGVs per day used Tower Bridge, with similar numbers recorded along the A117 in the vicinity of the Woolwich Ferry and higher flows along the A206. An upward trend is evident across the monitoring period at the two sites closest to the Woolwich Ferry.

Traffic volume trends at individual sites

Baseline data from the approximately 143 individual traffic monitoring sites within the area of influence are available for individual examination. These can be aggregated or disaggregated in arbitrary ways, for example by borough, although it should be noted that some links have multiple counting points along their length and could therefore be over-represented in basket-type calculations. In the post-opening period, this data will provide a basis for closer examination of traffic change in specific areas and on specific links and as such are not illustrated further in this report.

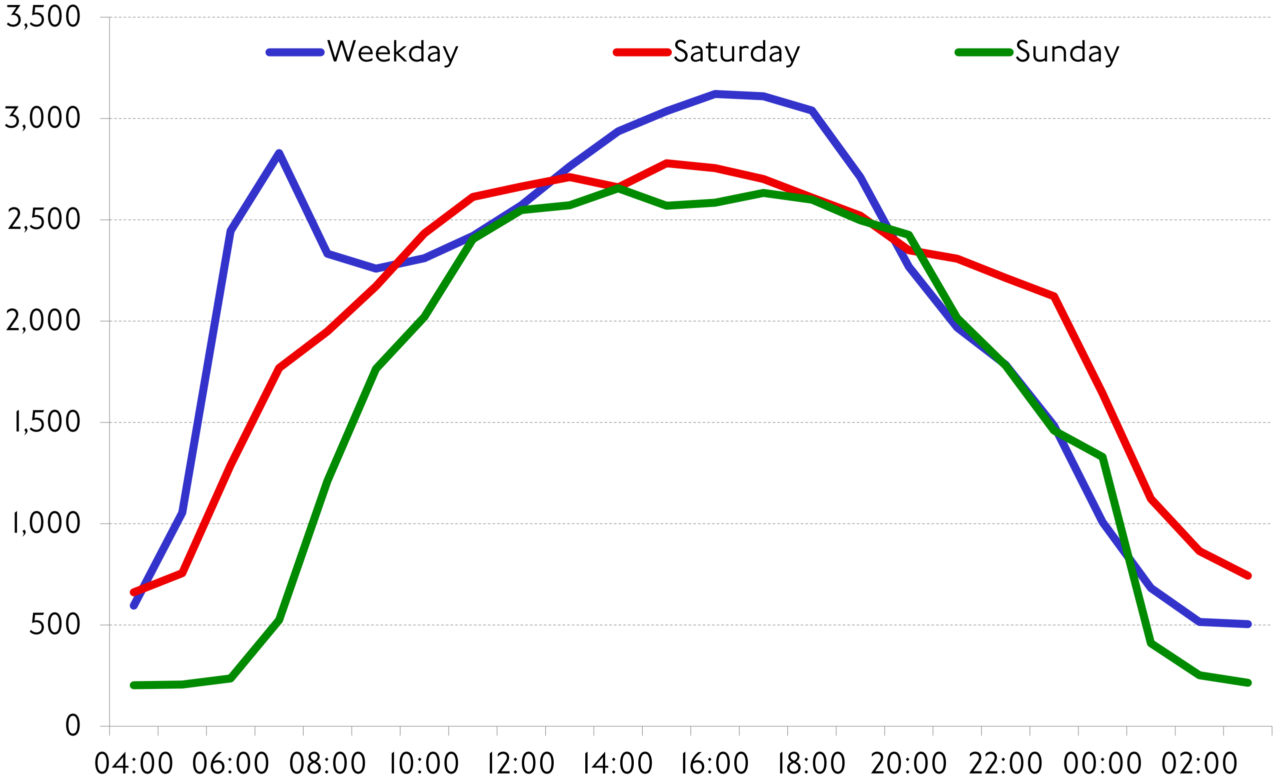
Traffic flows in the immediate vicinity of the new tunnel will however be of particular interest, given the operation of the user charge for both the existing Blackwall Tunnels and the new Silvertown Tunnel. Figures 4.8 and 4.9 show the daily profile of traffic flows on the approaches to the Blackwall Tunnels in the baseline period. This is provided by direction to reflect the tidal nature of traffic through this crossing.

Figure 4.8 Blackwall Tunnel northbound approach average hourly term-time traffic flow, by day of the week, from April 2022 until September 2024.



Source: Jacobs, on behalf of Transport for London.

Figure 4.9 Blackwall Tunnel southbound approach average hourly term-time traffic flow, by day of the week, from April 2022 until September 2024.



Source: Jacobs, on behalf of Transport for London.

In the northbound direction, the weekday morning peak of traffic flows through the Blackwall Tunnels was more pronounced than the evening peak, with high flows recorded from 06:00 onwards, when around 2,850 vehicles passed through the tunnel.

Traffic levels remained high throughout the day at around 2,500 vehicles per hour before the start of the evening peak. In contrast to the morning peak, the evening peak was flatter with slightly lower flows, around 2,700 vehicles per hour between 16:00 and 19:00.

In contrast to weekdays, there were no pronounced traffic peaks at the weekend. On both Saturdays and Sundays, northbound traffic flows between 10:00 and 20:00 reached similar levels to weekday inter-peak flows, of about 2,500 vehicles per hour. Outside this period, traffic levels were higher on Saturdays than they were on Sundays.

The southbound morning peak, while of a similar order of magnitude than the morning peak in the northbound direction (of about 2,850 vehicles per hour), occurred an hour later (from 07:00) and was also followed by a steep drop in traffic flow which then increased across the inter-peak period until a higher and more rounded evening peak, which reached around 3,100 vehicles per hour (compared with 2,700 vehicles per hour in the northbound direction).

Saturday and Sunday flows in the southbound direction had less of a plateau between 10:00 and 20:00 and also peaked at a slightly higher level of between 2,700 and 2,800 vehicles per hour rather than 2,500. Further, the early morning low flow period appeared to be longer in the southbound direction, especially on Sundays. Indeed, southbound Sunday early morning traffic flows were as much as half of those recorded in the northbound direction.

These differences in the northbound and southbound flow profiles can be partly explained by the tidal nature of traffic demand through the Blackwall Tunnels, where the predominant movements are northbound in the morning peak and southbound in the evening peak. The northbound tunnel is also subject to more significant capacity constraints and more frequent incidents than the southbound tunnel. This also potentially explains some of the differences, including the earlier and more sustained morning peak, as drivers adjust their time of travel to avoid congestion.

The addition of the new nearby Silvertown Tunnel would be expected to affect the demand profile through the Blackwall Tunnels, with the application of charging to both tunnels a further significant factor. Indices such as these, for both the Blackwall Tunnels and the Silvertown Tunnel, will provide crucial evidence for managing and optimising traffic flows in the period after the Silvertown Tunnel's opening.

4.5 Baseline journey times (road traffic)

Baseline journey times are considered under the broad headings below, providing a basis for both a comprehensive and more detailed evaluation of traffic volume change in relation to the scheme:

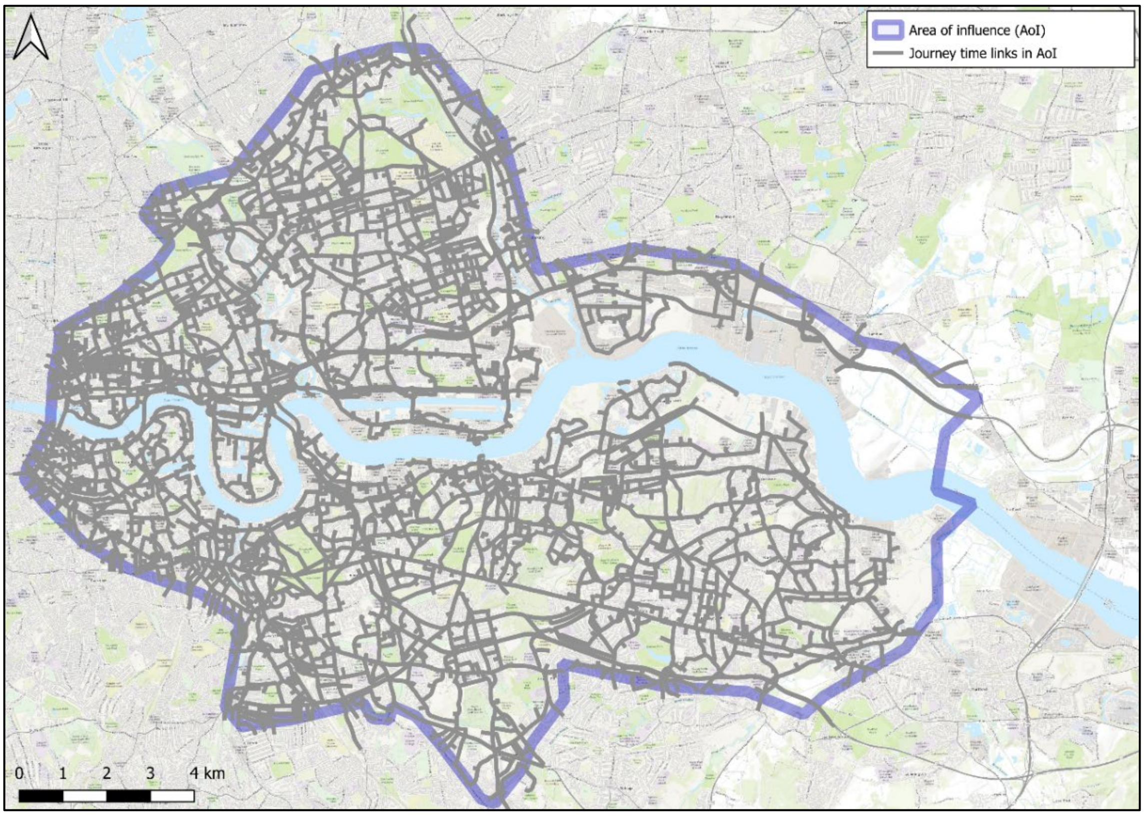
- **Area-based journey time trends** for all links combined across the area of influence. In combination with the aggregate traffic flow trends described above, this will provide a basis for an evaluation of the overall performance of the road network in the new tunnel's area of influence.
- **Journey times on key corridors within the area of influence**. This will provide the basis for a more detailed examination of the impacts on specific road corridors in the

area of influence, particularly those leading to and from the adjacent tunnels (Blackwall, Rotherhithe and Silvertown).
- A detailed breakdown of **journey times on the Blackwall Tunnels corridor**. Note that, in the post opening period, equivalent journey times data will also be available for the new Silvertown Tunnel.

Area-based journey time trends

In a similar way to traffic volumes, it is possible to aggregate journey times across the monitored road network in the area of influence (figure 4.10).

Figure 4.10 Monitored journey time links in the area of influence.



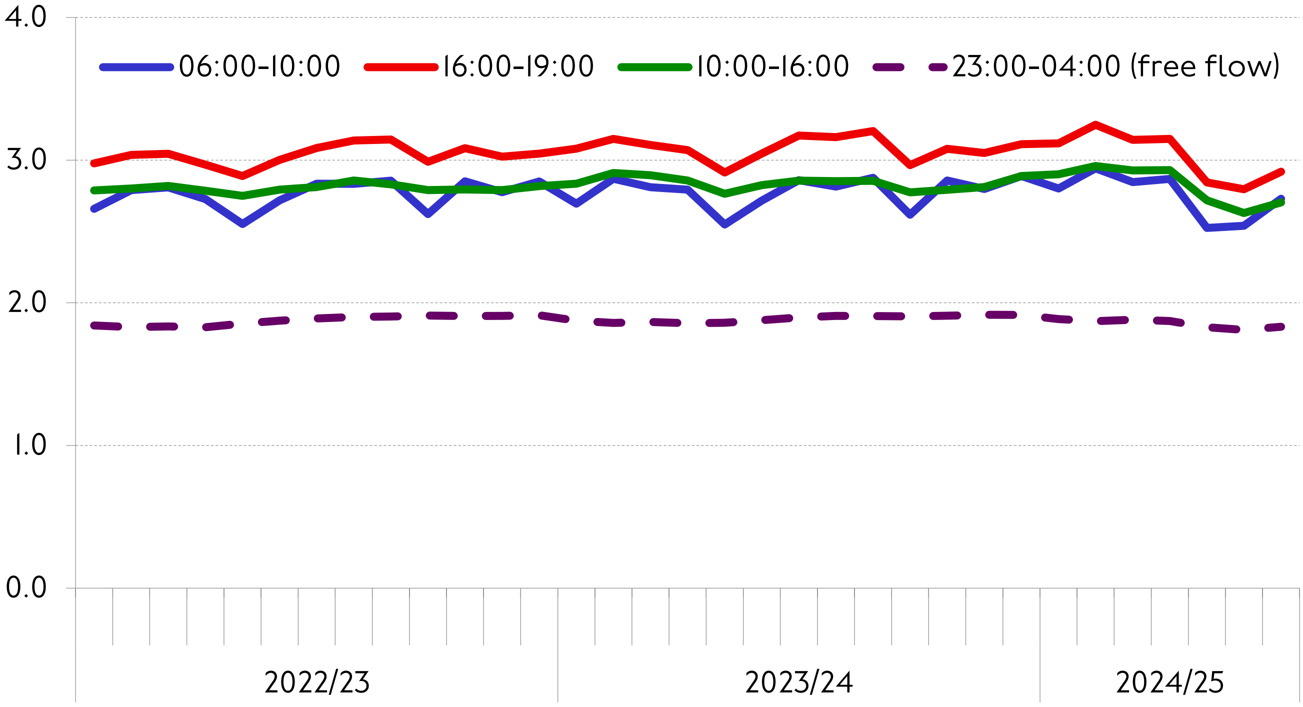
Source: Jacobs, on behalf of Transport for London.

Figure 4.11 shows the overall trend expressed as average weekday journey times (or travel rates, in minutes per kilometre) for all observed links.

Journey times were relatively consistent across the baseline period with no clear trend. Of interest, however, is the relative difference between weekday morning peak (06:00-10:00), inter-peak (10:00-16:00) and evening peak (16:00-19:00) periods, with the latter providing the slowest journeys (typically just over three minutes per kilometre).

Average journey times were subject to expected seasonal variation, with decreases occurring in financial period 5 (between July and August) and financial period 10 (in December), corresponding respectively with summer and Christmas holiday periods each year. Fewer commuting and business trips are typically made at these times, resulting in reduced congestion. In the 2024/25 financial year, period 5 and period 6 were subject to an expected seasonal low. Overall, however, the lack of clear trend over the baseline period makes a potentially interesting counterpart to the observation of slowly declining traffic volumes over the same period (see above).

Figure 4.11 Average weekday journey times (in minutes per kilometre) on all the observed links in the area of influence, by selected times of the day and financial period, from period 1 2022/23 until period 7 2024/25.

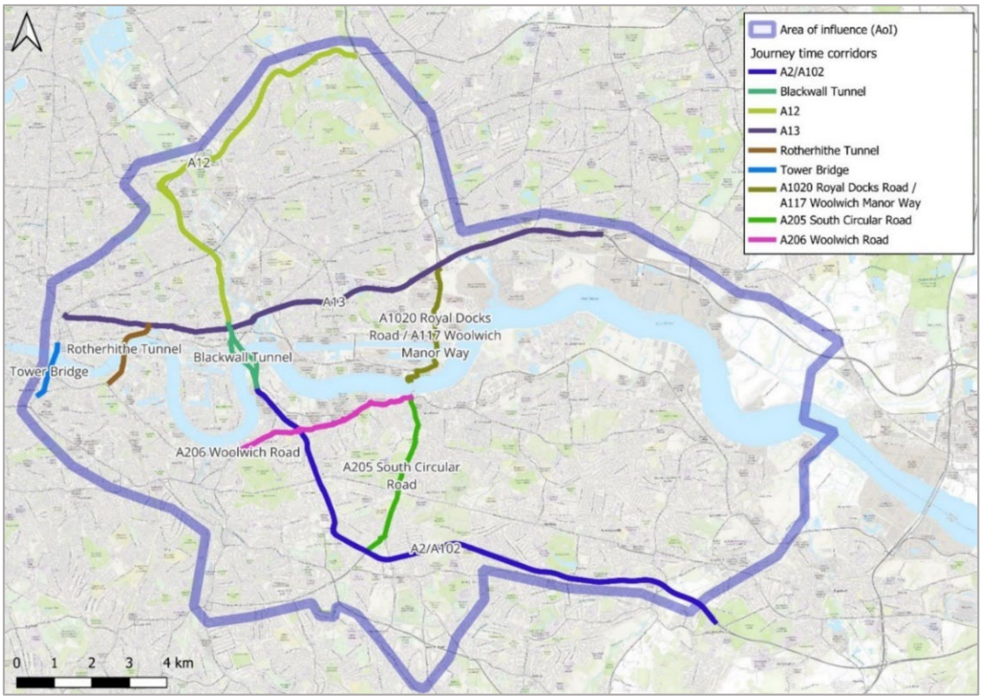


Source: Jacobs, on behalf of Transport for London.

Journey times on key corridors within the area of influence

As with traffic volumes, journey times can be assessed for key corridors within the area of influence (figure 4.12).

Figure 4.12 Journey time corridors in the area of influence.



Source: Jacobs, on behalf of Transport for London.

Annual average journey times for selected time periods along the corridors shown in figure 4.12 (which include the main traffic routes to the Blackwall Tunnels and neighbouring river crossings) are tabulated below to highlight key baseline trends. Absolute journey times and excess delay are provided. The latter is an indicator of congestion and is calculated by subtracting the average travel rate under uncongested or free-flow conditions (typically overnight) from the actual travel rate for the period under consideration.

Table 4.1 Annual weekday (Tuesday to Thursday, term time) morning and evening peak average journey time and average excess delay (in minutes per kilometre) along the journey time corridors, INRIX, 2.5-year average from April 2022 until September 2024.

Corridor	06:00-10:00 journey time	16:00-19:00 journey time	06:00-10:00 excess delay	16:00-19:00 excess delay
A12 northbound	1.1	2.0	0.1	1.1
A12 southbound	1.2	1.7	0.2	0.8
A13 eastbound	1.7	3.6	0.3	2.1
A13 westbound	2.6	2.4	1.2	1.0
A2/A102 northbound	2.1	1.3	1.3	0.5
A2/A102 southbound	1.0	1.4	0.1	0.5
Blackwall Tunnels northbound	2.2	2.2	0.8	0.8
Blackwall Tunnels southbound	1.8	2.5	0.5	1.1
Rotherhithe Tunnel northbound	2.3	3.0	0.3	1.0
Rotherhithe Tunnel southbound	2.3	2.4	0.4	0.4
Tower Bridge northbound	4.9	6.7	2.5	4.2
Tower Bridge southbound	5.0	5.5	2.4	3.0
A1020/A117 southbound	2.4	3.0	0.8	1.4
A205 South Circular Road northbound	2.0	2.3	0.5	0.7
A206 Woolwich Road eastbound	2.8	3.7	1.0	1.9

[Table continues on the next page]

Corridor	06:00-10:00 journey time	16:00-19:00 journey time	06:00-10:00 excess delay	16:00-19:00 excess delay
A206 Woolwich Road westbound	4.1	3.3	2.2	1.4
A102 Sun-in-the-Sands (southern tunnel portal) northbound	5.4	3.5	4.5 [note 1]	2.6 [note 1]
A12/A102 Bow Interchange (northern tunnel portal) southbound	1.9	5.2	0.9 [note 1]	4.2 [note 1]

Source: Jacobs, on behalf of Transport for London.
[Note 1] The excess delay for this corridor uses speed limits as a proxy for free-flow conditions.

The table shows significant levels of excess delay on Tower Bridge, the A13 and the A2/A102 corridor. Delay through the Blackwall Tunnels themselves is relatively low because the worst congestion tends to occur on the approaches to the tunnels rather than through the tunnels themselves. Comparative figures have been included at the bottom of the table for these approaches from the Sun-in-the-Sands junction to the south and from the Bow Interchange to the north. The table indicates that excess delay on these routes was severe during the monitoring period, above four minutes per kilometre both northbound in the morning peak and southbound in the evening peak, higher than any other route reported.

Journey time trends on the Blackwall Tunnels and approaches

As described above, the most significant congestion in relation to the Blackwall Tunnels is on the main approach routes: the A12 from the north and the A2/A102 from the south.

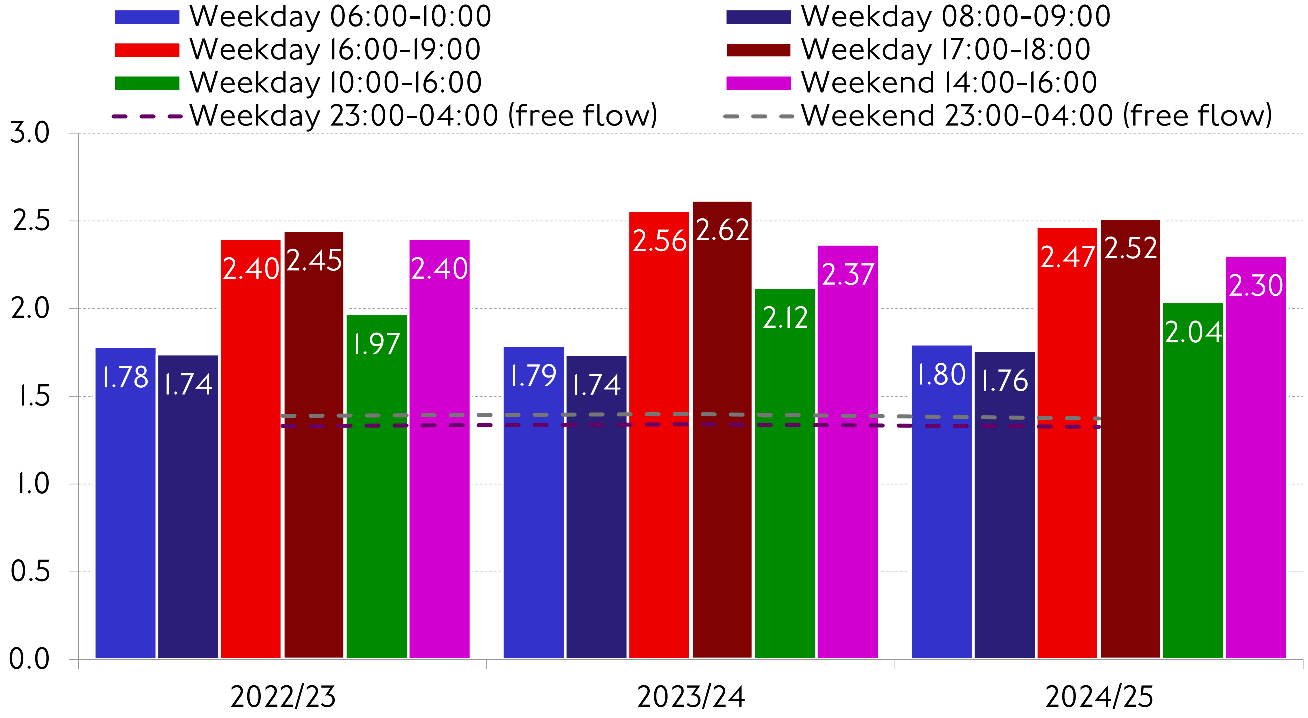
In terms of the journey time links shown in figure 4.12 above, figures 4.13 and 4.14 show the baseline journey time trends for the Blackwall Tunnels themselves (southbound and northbound respectively). Figures 4.14 and 4.15 show the equivalent trend for the main north and south approach corridors for the direction approaching the tunnel only.

Looking first at the **Blackwall Tunnels themselves**, the annual average journey times in the northbound direction (figure 4.13) were comparable across all periods, ranging between 2.13 and 2.35 minutes per kilometre. The weekend peak period had the highest average journey time in the 2022/23 financial year. However, weekday journey times increased slightly after the 2022/23 financial year to levels comparable with weekend journey times, suggesting an increasing baseline trend.

The annual average journey times in the southbound direction (figure 4.13) were highest in the weekday 17:00-18:00 peak hour, between 2.40 and 2.62 minutes per kilometre. Evening peak times were similar to the weekend peak period. Unlike the northbound direction, southbound times were generally consistent across the baseline period.

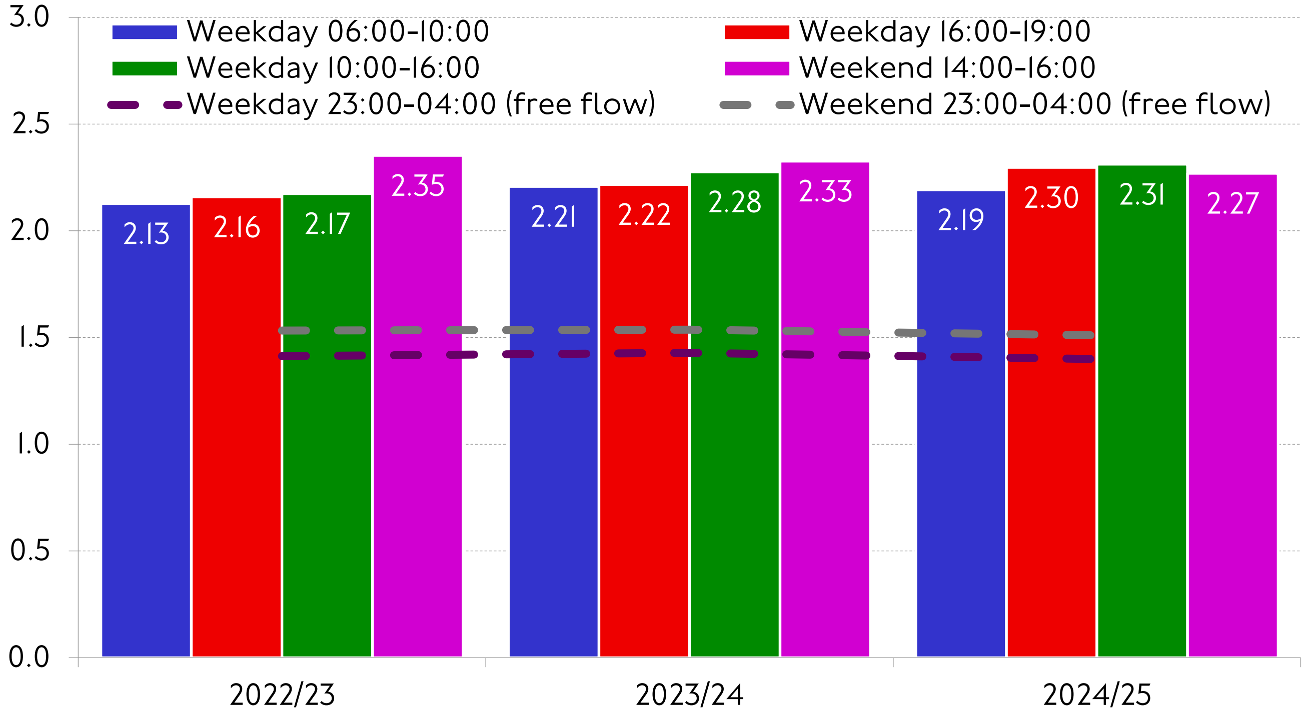
For the **corridors approaching the Blackwall Tunnels**, the relatively greater route length (figure 4.12) should be recognised, as should the generally faster nature of the roads comprising the corridor. More disaggregate breakdowns are potentially available.

Figure 4.13 Southbound annual average journey times (in minutes per kilometre) along the Blackwall Tunnels, by selected times of the day and financial year, INRIX, from 2022/23 until 2024/25.



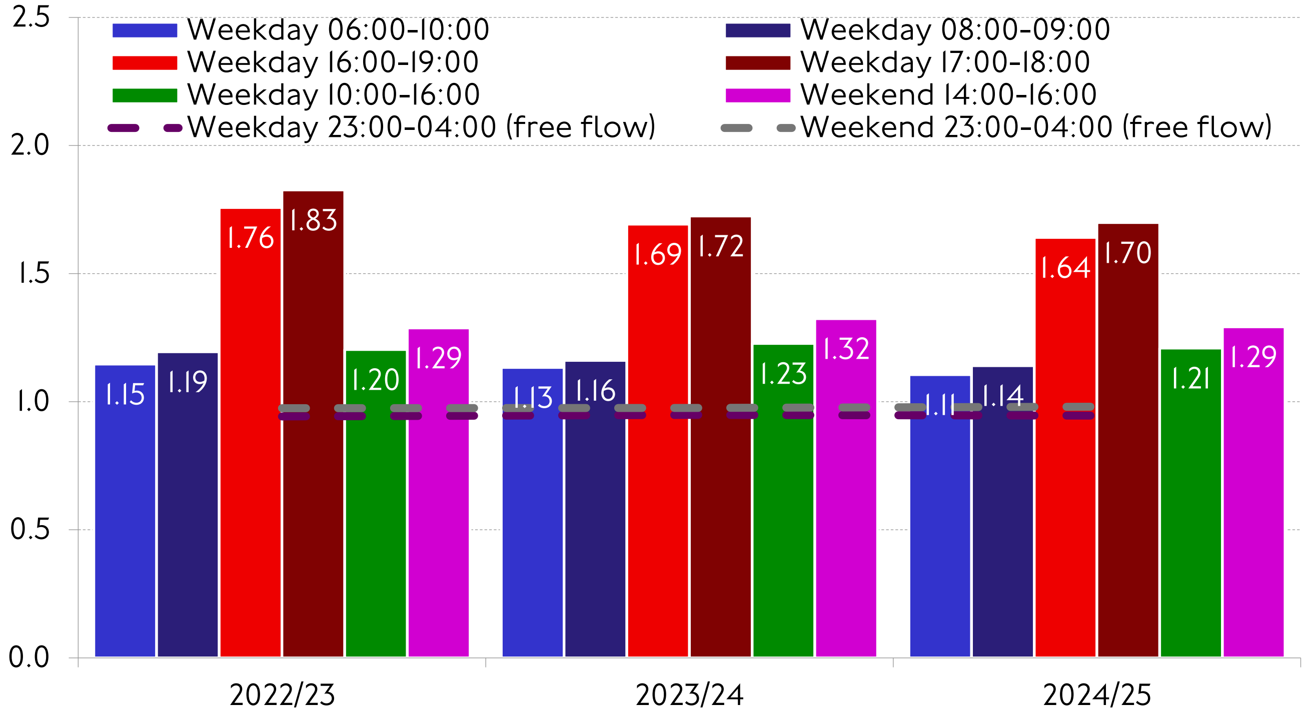
Source: Jacobs, on behalf of Transport for London.
Notes: 2024/25 covers April to September 2024. | Weekdays use a term-time Tuesday to Thursday average.

Figure 4.14 Northbound annual average journey times (in minutes per kilometre) along the Blackwall Tunnels, by selected times of the day and financial year, INRIX, from 2022/23 until 2024/25.



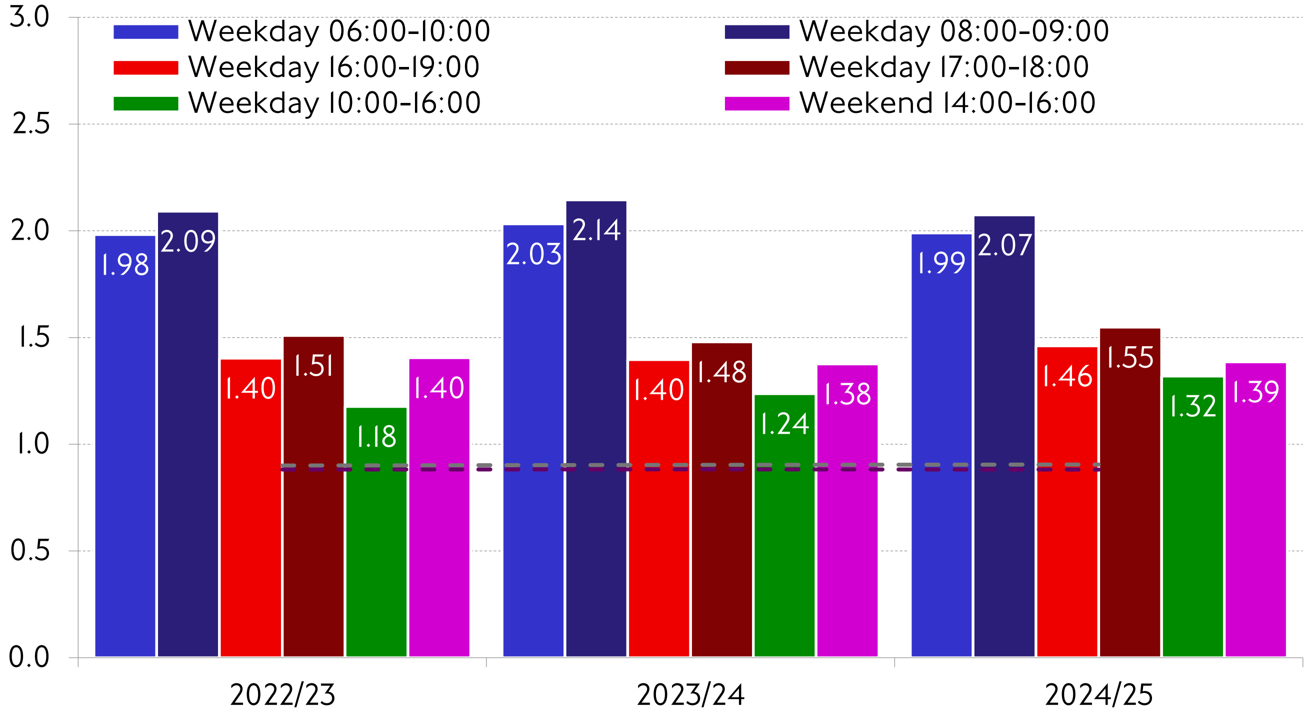
Source: Jacobs, on behalf of Transport for London.
Notes: 2024/25 covers April to September 2024. | Weekdays use a term-time Tuesday to Thursday average.

Figure 4.15 Southbound annual average journey times (in minutes per kilometre) along the A12 corridor approaching the Blackwall Tunnels, by selected times of the day and financial year, INRIX, from 2022/23 until 2024/25.



Source: Jacobs, on behalf of Transport for London.
Notes: 2024/25 covers April to September 2024. | Weekdays use a term-time Tuesday to Thursday average.

Figure 4.16 Northbound annual average journey times (in minutes per kilometre) along the A2/A102 corridor approaching the Blackwall Tunnels, by selected times of the day and financial year, INRIX, from 2022/23 until 2024/25.



Source: Jacobs, on behalf of Transport for London.
Notes: 2024/25 covers April to September 2024. | Weekdays use a term-time Tuesday to Thursday average.

Average journey times on the A12 corridor in the southbound direction towards the Blackwall Tunnels (figure 4.14) were relatively consistent year-on-year across the baseline period, with the highest journey times in the afternoon peak averaging just under two minutes per kilometre.

Average journey times along the A2/A102 corridor in the northbound direction towards the Blackwall Tunnels (figure 4.15) show the opposite diurnal pattern, with highest journey times in the morning peak averaging just over two minutes per kilometre but again with relatively little change over the baseline monitoring period.

Equivalent data is available for other relevant river crossings like the Rotherhithe Tunnel and Tower Bridge, as well as for the principal east-west corridors in the area of influence.

Journey time variability on the Blackwall Tunnels and approaches

As well as average journey time, journey time variability is an important measure of how congestion is experienced by road users, since unpredictability (perceived or actual) of journey times can lead to drivers allowing longer than they need for their journeys as a precautionary measure. For goods vehicles on time-critical rounds, for example, both early and late arrivals can equally be a source of economic inefficiency.

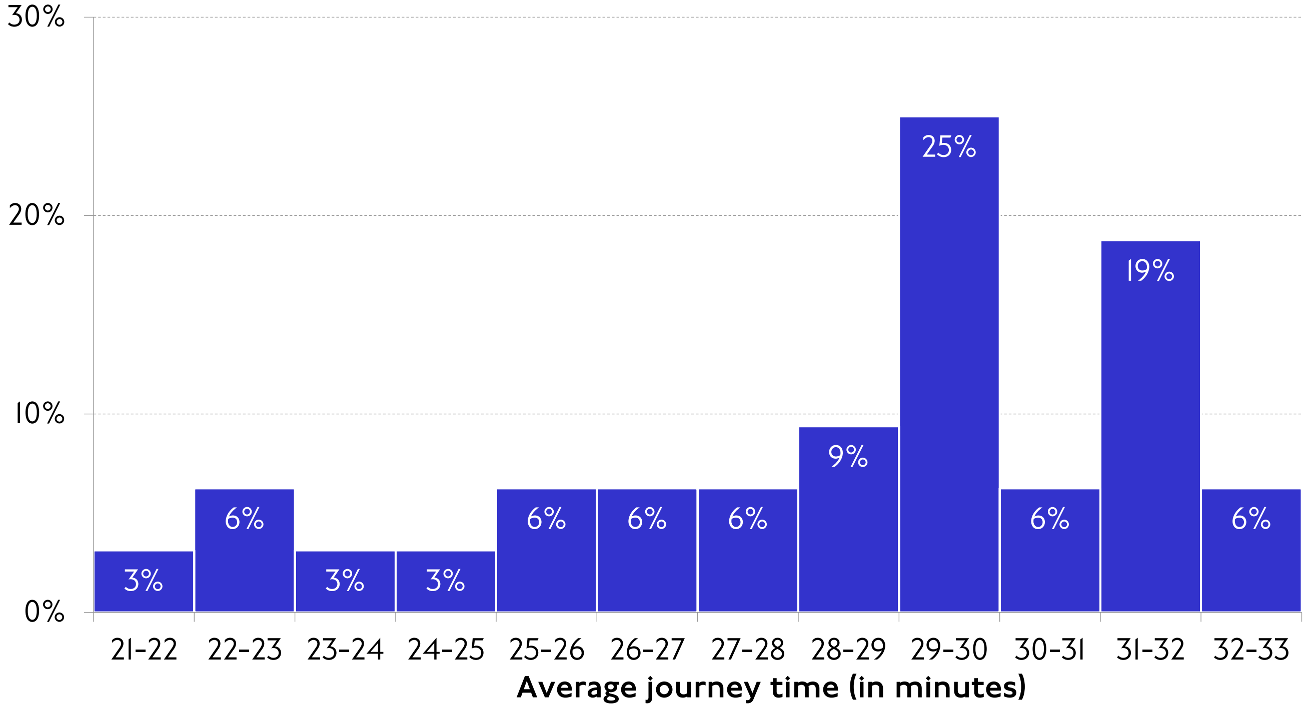
Figures 4.17 and 4.18 illustrate baseline conditions for this indicator looking at the weekday morning peak in the northbound direction and the weekday evening peak in the southbound direction (the busiest periods/directions).

For this analysis, the Blackwall Tunnels corridor was defined as the 12km length of road along the A2/A102/A12 between the South Circular Road (A205) to the south of the river and Wick Road (A106) to the north of the river. The figures show aggregated average values for each four-week reporting period and therefore journey time variability on a day-to-day basis is likely to be substantially greater.

The highest journey time variability was seen in the morning peak northbound and the evening peak southbound, with a difference of 11-12 minutes between the fastest and the slowest average journey times. Less variation was seen in the counter-peak directions (that is, southbound in the morning peak and northbound in the evening peak, not illustrated), with a difference of only six to nine minutes between the fastest and the slowest average journey times.

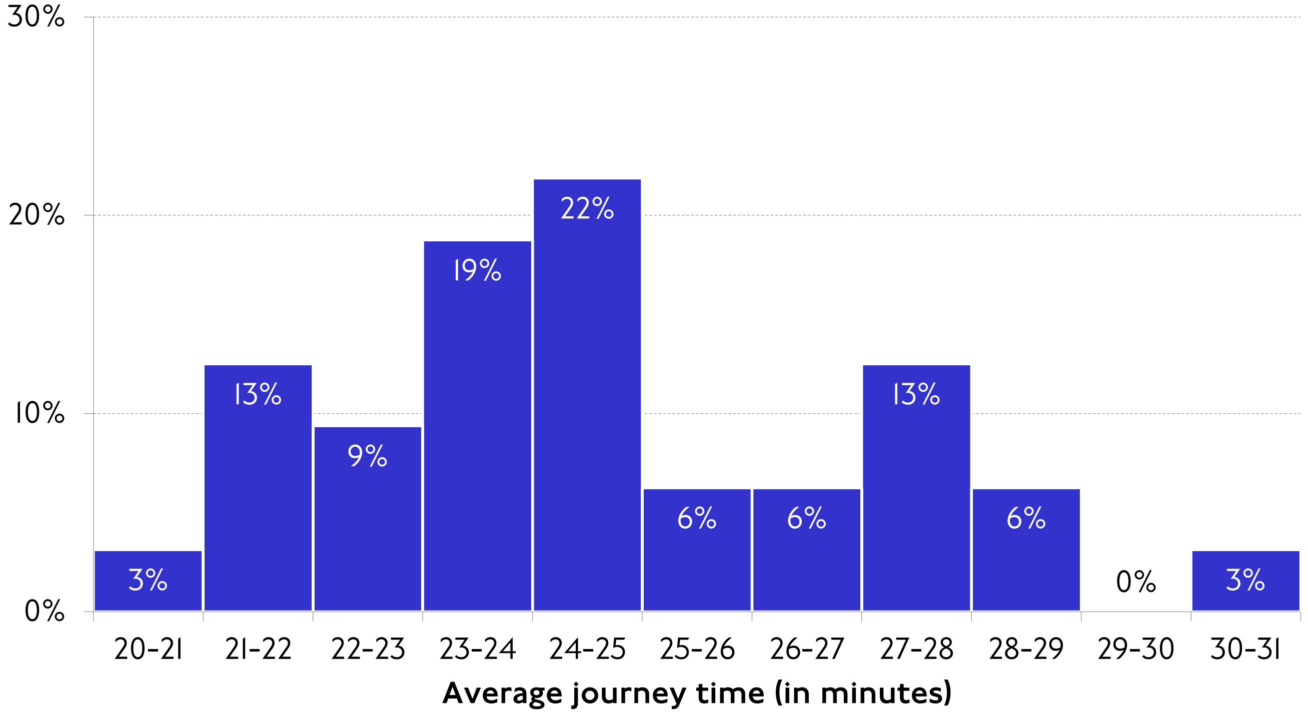
In general, across both peaks, there was higher variation in journey times in the northbound direction than southbound. This is likely due to more pronounced capacity constraints and sub-standard geometry on the northbound bore tunnel (reflected in the four-metre vehicle height restriction), which results in more disruption to traffic.

Figure 4.17 Distribution of the weekday (Tuesday to Thursday, term-time) morning peak (06:00-10:00) financial period average journey times along the Blackwall Tunnels corridor in the northbound direction, INRIX, from period 1 2022/23 until period 6 2024/25.



Source: Jacobs, on behalf of Transport for London.

Figure 4.18 Distribution of the weekday (Tuesday to Thursday, term-time) evening peak (16:00-19:00) financial period average journey times along the Blackwall Tunnels corridor in the southbound direction, INRIX, from period 1 2022/23 until period 6 2024/25.



Source: Jacobs, on behalf of Transport for London.

4.10 Baseline junction performance

Delays occurring at junctions are a principal cause of both congestion and extended journey times. Changes to these after the opening of the Silvertown Tunnel will be key to the overall performance of the road network, as will optimising them (for example through traffic signal settings) in response to observed changes in traffic flows and delays in the early months following the opening of the tunnel.

Junction delays can be derived from aggregated journey time data (as minutes per kilometre) across the multiple links that comprise each junction, divided into entry or inbound links (towards the junction), exit or outbound links leading away from the junction and other links such as slip roads or circulatory links within the junction itself.

As above, each link is subject to a free-flow journey time that represents the time taken to travel along a link without any delay due to traffic, calculated using journey times measured overnight (between 23:00 and 04:00) as a proxy for free-flow traffic conditions. The provided journey time data is converted into a metric of excess delay by subtracting the free-flow journey time from the reported peak period journey times. This results in an excess delay metric that only represents delays caused by traffic congestion and not delays from implicit factors such as road geometry or speed limits.

The following key measures are available:

- Headline area-based junction delay trends: average junction delay trends for all identified junctions within the area of influence
- Junction delays at key junctions within the area of influence: junction delay trends for key junctions within the area of influence

Scope of junction delay monitoring

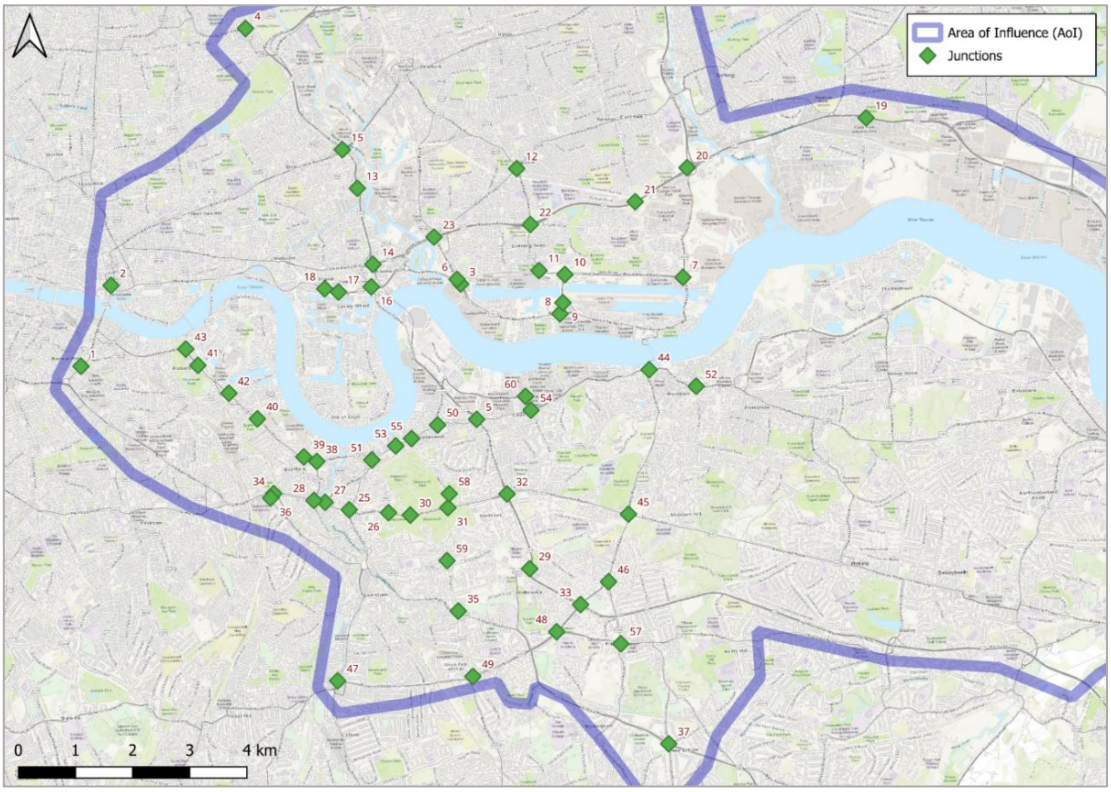
Figure 4.19 shows the scope of junction monitoring in the area of influence. These junctions have been chosen due to their strategic importance to the wider road network and the potential for changes in traffic conditions after the Silvertown Tunnel's opening.

Area-based junction delay trends

Aggregating and averaging delays at all monitored junctions in the area of influence provides an overall measure of the performance of the road network but is not of itself very informative. Looking at entry links only, figure 4.20 shows the average delay for all monitored junctions for the baseline period by financial year.

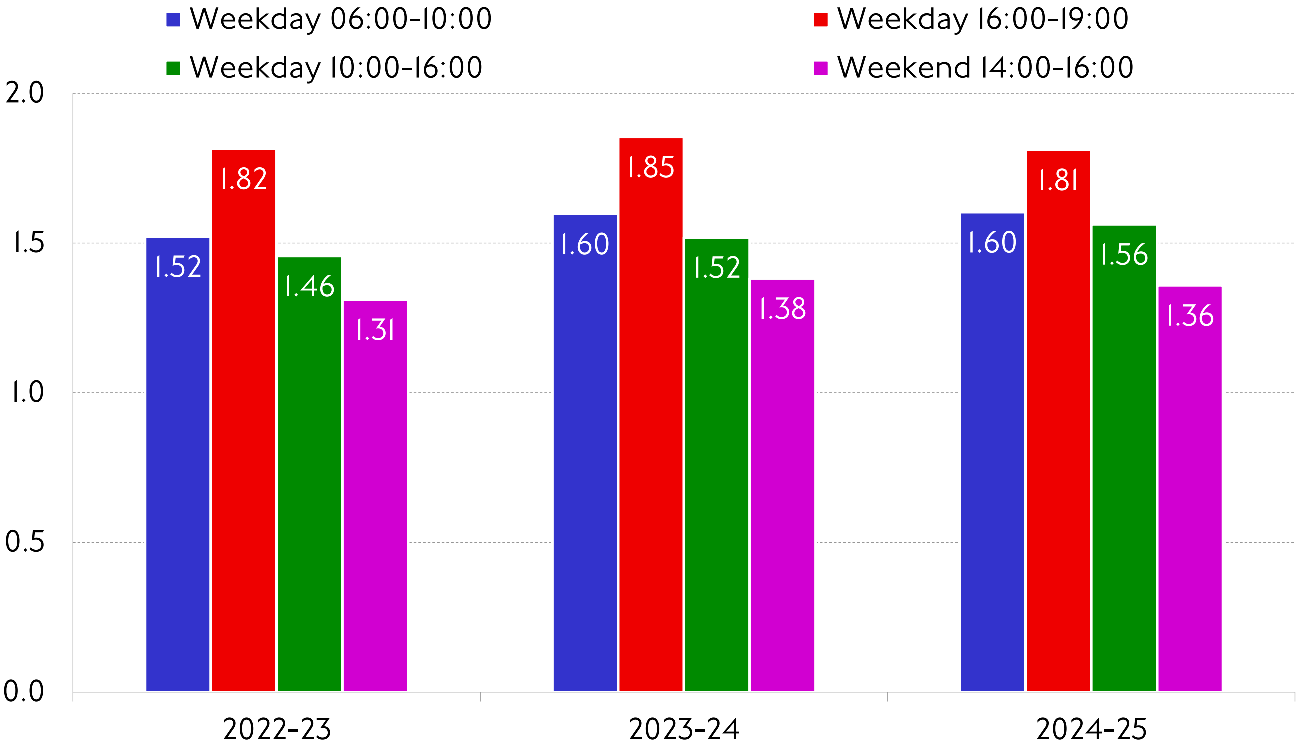
The average excess delay for all entry links across key junctions in the area of influence varies between 1.31 and 1.85 minutes per kilometre. Across the baseline period, there was a small increase in excess delay during the weekday morning peak, inter-peak period, and the weekend peak for all entry links. However, the weekday evening peak period remained constant across the pre-opening monitoring period. This provides a potential contrast with the observed slowly declining traffic trend over the baseline period.

Figure 4.19 Junction delay monitoring sites in the area of influence.



Source: Jacobs, on behalf of Transport for London.

Figure 4.20 Average excess delay (in minutes per kilometre) on all the entry links across key junctions in the area of influence, by selected times of day and financial year, INRIX, from 2022/23 until 2024/25.



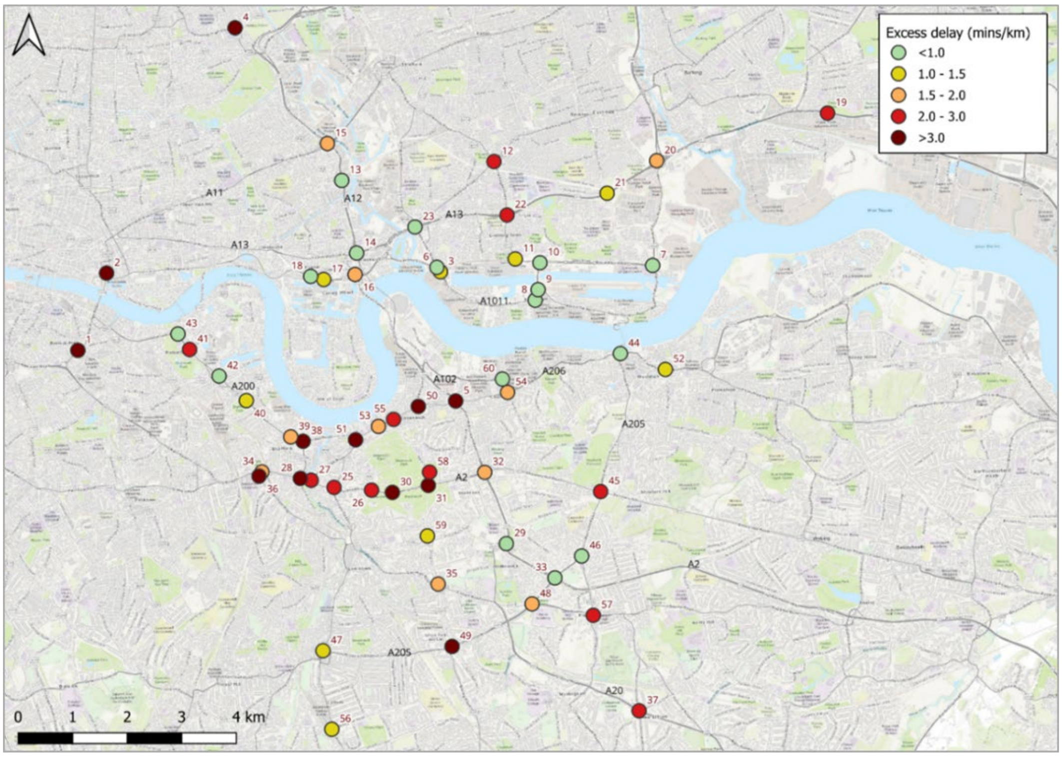
Source: Jacobs, on behalf of Transport for London.
Notes: 2024/25 covers April to September 2024. | Weekdays use a term-time Tuesday to Thursday average.

Junction delay trends: specific junctions

It is also possible to look at specific junctions within the area of influence, and this level of analysis will be important in the early weeks after the tunnel's opening.

Looking at the morning peak period and only at entry links, figure 4.21 shows one example of this level of analysis for the weekday morning peak hour (08:00-09:00).

Figure 4.21 Average excess delay (in minutes per kilometre) in the weekday (Tuesday to Thursday, term-time) morning peak hour (08:00-09:00) on all the entry links across key junctions in the area of influence, INRIX, 2.5-year average from April 2022 until September 2024.



Source: Jacobs, on behalf of Transport for London.

There were numerous junctions with an excess delay of 2.0 minutes per kilometre or more. These were primarily concentrated south of the River Thames along the A2 and A206/A200 corridors towards the Rotherhithe Tunnel and Tower Bridge. There were also junctions with relatively high excess delay on either side of Tower Bridge, along the A205 South Circular Road, and on the A102 in Hackney.

4.11 Road traffic impacts: forward look

The above provides a summary of the data that will be available to TfL for this element of the work. After the opening, analysis will be guided by the pattern of impacts as they emerge. It is important to recognise that traffic demand and the local road network may require a period of weeks or months to settle to a steady state and that TfL's efforts in the interim will be focused on optimising the day-to-day operation of the network.

Emerging impacts will be summarised in quarterly reports to the STIG. Consolidated reports providing a more comprehensive view and full comparison against baselines will then be produced approximately annually, allowing time for data collation and analysis.

5. Other road network and travel impacts

5.1 Introduction

This section covers a range of impacts arising from changes to the road network and the transport offer in the local area as a result of the scheme. Complete or partial baselines are in place for all of these, as appropriate, although the extent to which these can be meaningfully collated varies. For example, although the scheme includes significant additional bus capacity through the new Silvertown Tunnel, these new routes did not commence operation until the opening and therefore only partial data relating to the pre-existing network (which partially overlaps with the new bus routes) is available for the baseline. In other cases, for example for the change in aggregate road traffic carbon dioxide emissions from traffic change resulting from the scheme, a full collation of baseline traffic data is required before the necessary calculations can be carried out. This means that definitive pre-opening estimates are not available at the time of writing (although the disaggregate traffic flow data on which it will be based is publicly available). Further details of these limitations are given as applicable below.

5.2 Cycling: dedicated cycle shuttle bus

Introduction

The Silvertown Tunnel offers new cross-river connectivity specifically for people cycling. Although cycling through the tunnel itself is not permitted for safety reasons, a dedicated high-quality cycle shuttle bus is provided free to use for at least the first year.

Figure 5.1 The Silvertown Cycle Shuttle bus.

Source: Transport for London.

The initial offer consists of five buses per hour in both directions providing a safe way to cross the river on a turn up and go basis. The specially branded buses run between dedicated stops close to the tunnel portals, connecting into the wider road and cycling network. The buses, which are only available to riders with cycles, each have capacity for eight conventional cycles or e-bikes (or four conventional cycles/e-bikes and one cargo or adapted cycle) and up to nine folding cycles. The service runs daily between 06:30 and 21:30, therefore providing a maximum theoretical cycle throughput (both directions combined) of 170 cycles per hour or 2,550 cycles per operating day (assuming full load of conventional/e-bike and folding cycles). Assuming only a full load of conventional cycles or e-bikes (the most common types observed in London), the maximum throughput would be of 80 cycles per hour or 1,200 cycles per operating day.

Monitoring the usage of the Silvertown Cycle Shuttle bus

The level of service described above is expected to be appropriate for the expected. However, it is important (particularly in the early days of operation) that this assumption is confirmed. Periodic, video-assisted manual counts of cycles using the service, taken at each of the shuttle bus stops, is the most appropriate and flexible means of achieving this, particularly given the need, at least in the early days, to understand the extent of any excess demand (that is, left-behind or otherwise deterred cyclists).

Since this is a new service, there is no baseline data for it. During the first year of operation, monitoring at each of the stops is planned to be continuous during the first two weeks of operation to understand any initial demand patterns and then at quarterly intervals thereafter. Monitoring in each quarterly period will cover several days and all shuttle bus operational hours to be representative. These quarterly counts will be aligned with TfL's wider business-as-usual cycle monitoring programme. Feedback from the cycle shuttle bus service provider will also be key to understanding initial demand impacts and data on the operational performance of the service will also be monitored through appropriate contractual arrangements.

5.3 Cycling: changes to cycle flows in the vicinity of the new tunnel

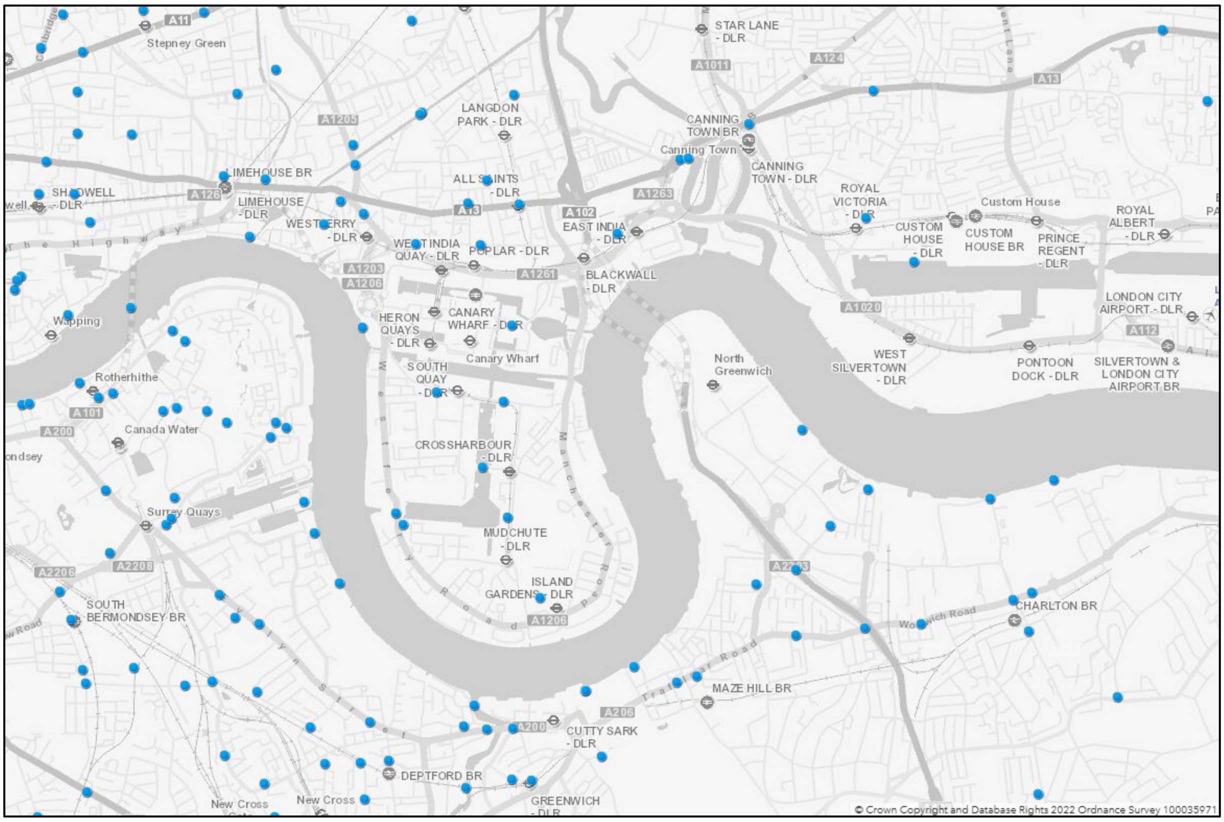
In the context of overall cycle flows in the area around the tunnel, flows directly using the shuttle bus will be relatively small. Nevertheless, the tunnel opens up new connectivity and hence any wider impacts on cycle flows are also of interest.

TfL's regular cycle counting programme

The monitoring of the cycle shuttle bus takes place in the context of TfL's wider cycle monitoring programme in London and is integrated with it. This provides a view of change at cycle monitoring locations in the areas around both tunnel portals and the wider local road and cycling network.

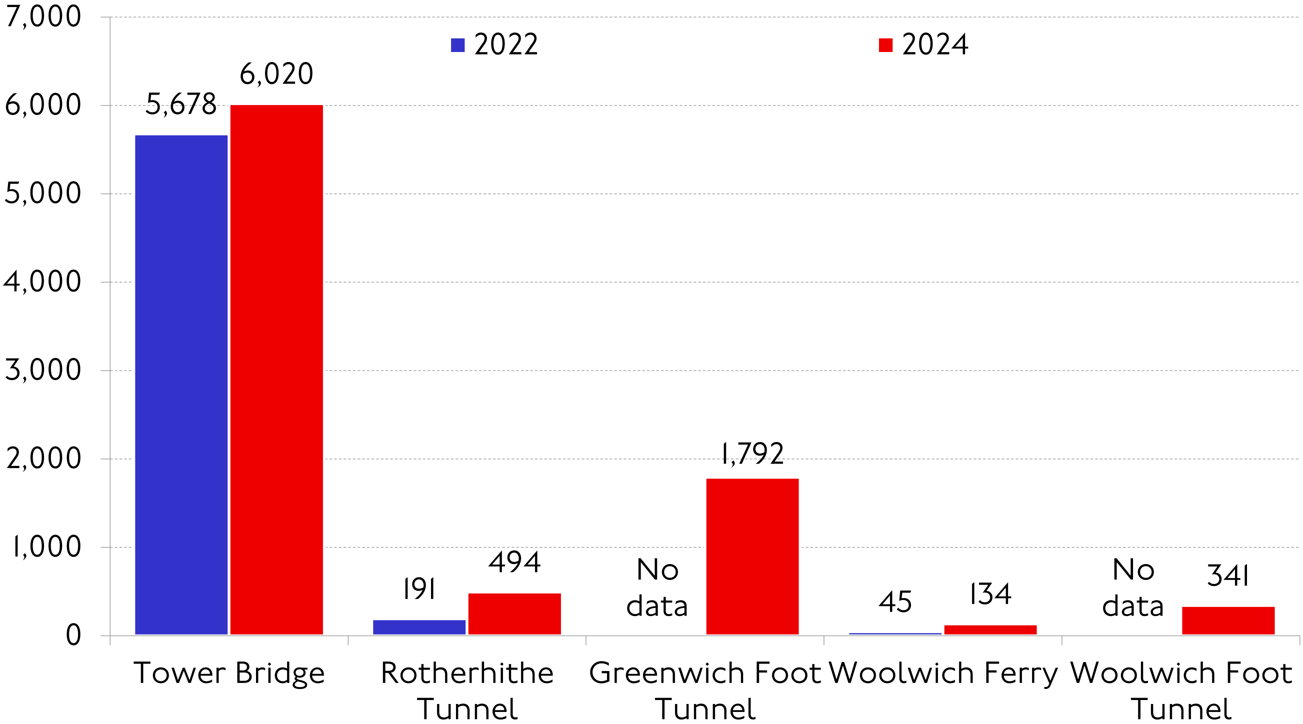
Historic counts for TfL's business-as-usual cycle monitoring locations in the vicinity of the tunnel are available at cycling.data.tfl.gov.uk. These do not form a coherent baseline for looking specifically at impacts in the vicinity of the tunnel, since they were not originally designed for this purpose. However, they are available for investigative comparisons on a site-by-site basis with equivalent counts taken after the opening. Figure 5.2 shows the extent of these counts in the vicinity of the tunnel.

Figure 5.2 TfL's regular cycle counting locations in the vicinity of the Silvertown and Blackwall Tunnels.



Source: Transport for London.

Figure 5.3 Total daily (24 hours) bidirectional cycle flow at selected river crossings, by year, 2022 and 2024.



Source: TfL Strategic Analysis, Customer & Strategy.

Cross-river cycling

The impact of the new cycle connectivity on cycling along existing river crossings in the area is also of interest, given the new cross-river capacity provided with the cycle shuttle bus. To measure this, we will use our business-as-usual, biennial Thames screenline counts on motor vehicle crossings and supplement them with additional counts on other cyclable river crossings between (and including) Tower Bridge and the Woolwich Ferry and conduct additional counts on these cyclable crossings annually for the first three years after the tunnel's opening.

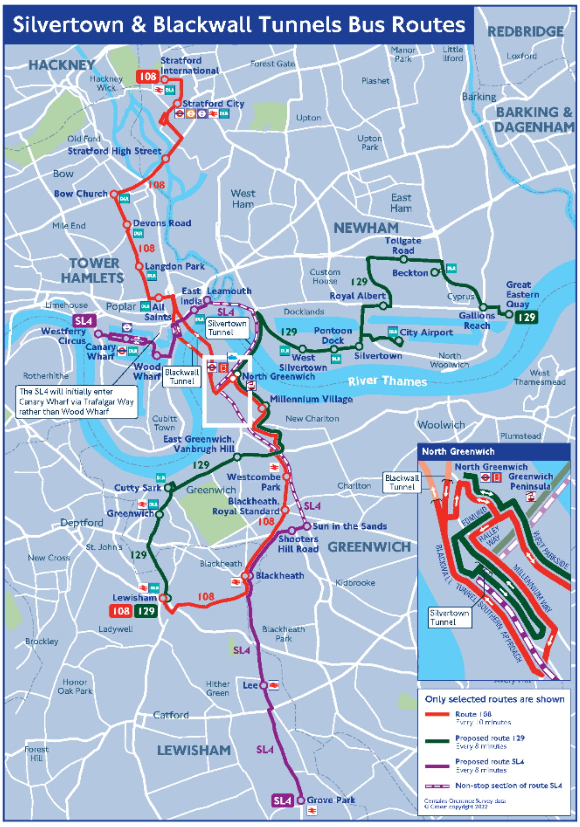
Figure 5.3 shows the trend in bi-directional cycle flows observed at these cyclable crossings near the new Silvertown Tunnel over recent years where data is available. Note that the Blackwall Tunnels are excluded because cycling is not permitted through them.

5.4 Buses: zero-emission bus routes 108, 129 and Superloop SL4

The Silvertown Tunnel transforms how residents in east and southeast London can cross the river by bus for work, education and leisure. Prior to the opening, only bus route 108 crossed the river from North Greenwich via the Blackwall Tunnels and no double-deck buses crossed the river between Tower Bridge and the Dartford Crossing.

With the Silvertown Tunnel open, in addition to route 108 via the Blackwall Tunnels, the new Superloop SL4 route runs through the new Silvertown Tunnel from Grove Park to Canary Wharf and an extension to route 129 runs from Lewisham to City Airport and Great Eastern Quay (figure 5.4).

Figure 5.4 Bus routes through the Silvertown and Blackwall Tunnels.



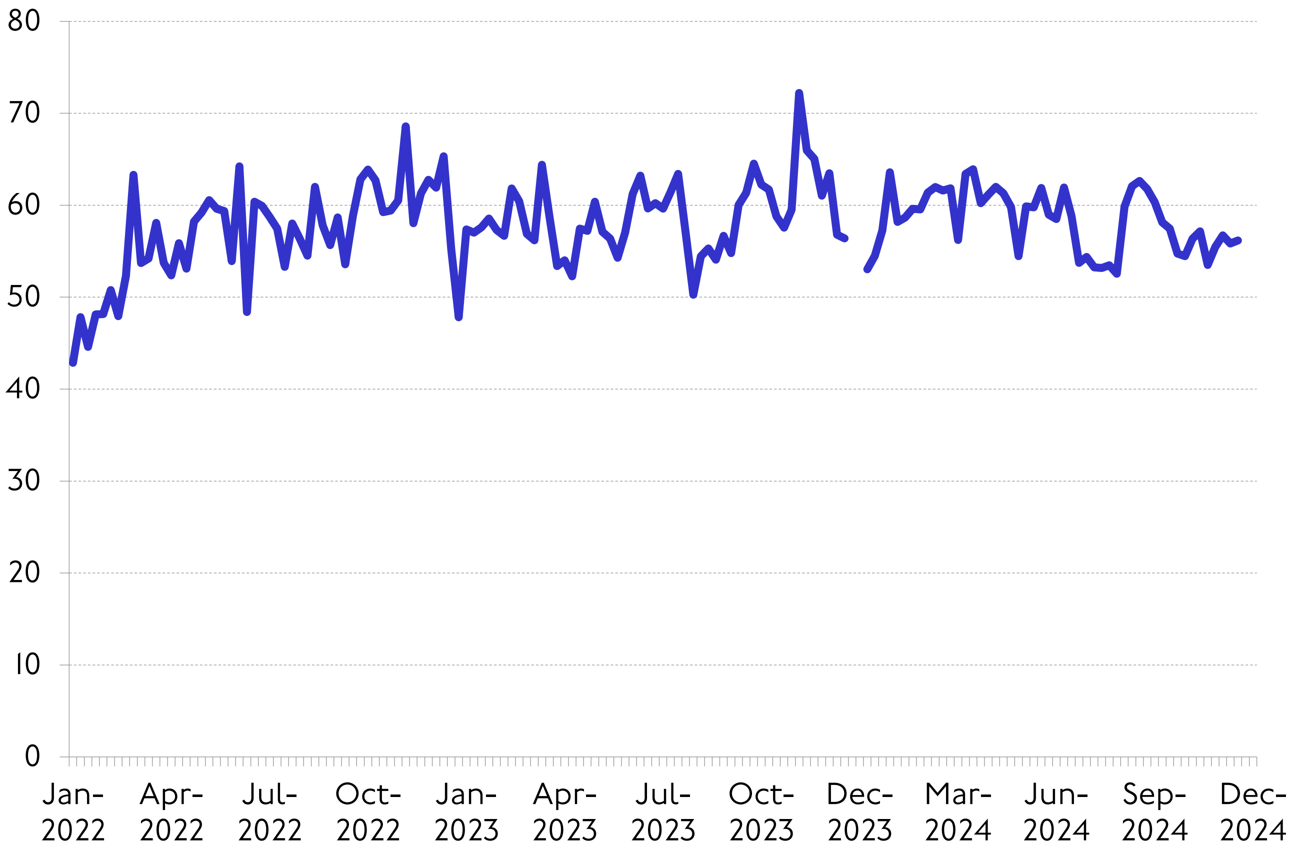
Source: Transport for London.

In total, the three routes offer a new east London cross-river network of 21 zero-emission (at the tailpipe) buses in each direction at the busiest times between 07:00 and 19:00, Monday to Friday. This extended network (up from six buses per hour) offers better access to town centres, jobs and education.

TfL will monitor the demand for, and operational performance of, these bus services using our existing public transport monitoring methods. Unlike other types of public transport, the bus network is highly flexible and if demand for services increases this can be addressed quickly.

Historic data for route 108 is available as part of TfL's business-as-usual monitoring and illustrates the data that will be available for the new routes after the opening. Figure 5.5 shows the long-term trend in the usage of this route (in terms of boarders for the whole route in both directions) as weekly (seven-day week) totals for three previous years.

Figure 5.5 Weekly bidirectional boarders (in thousands) on bus route 108, from January 2022 until December 2024.

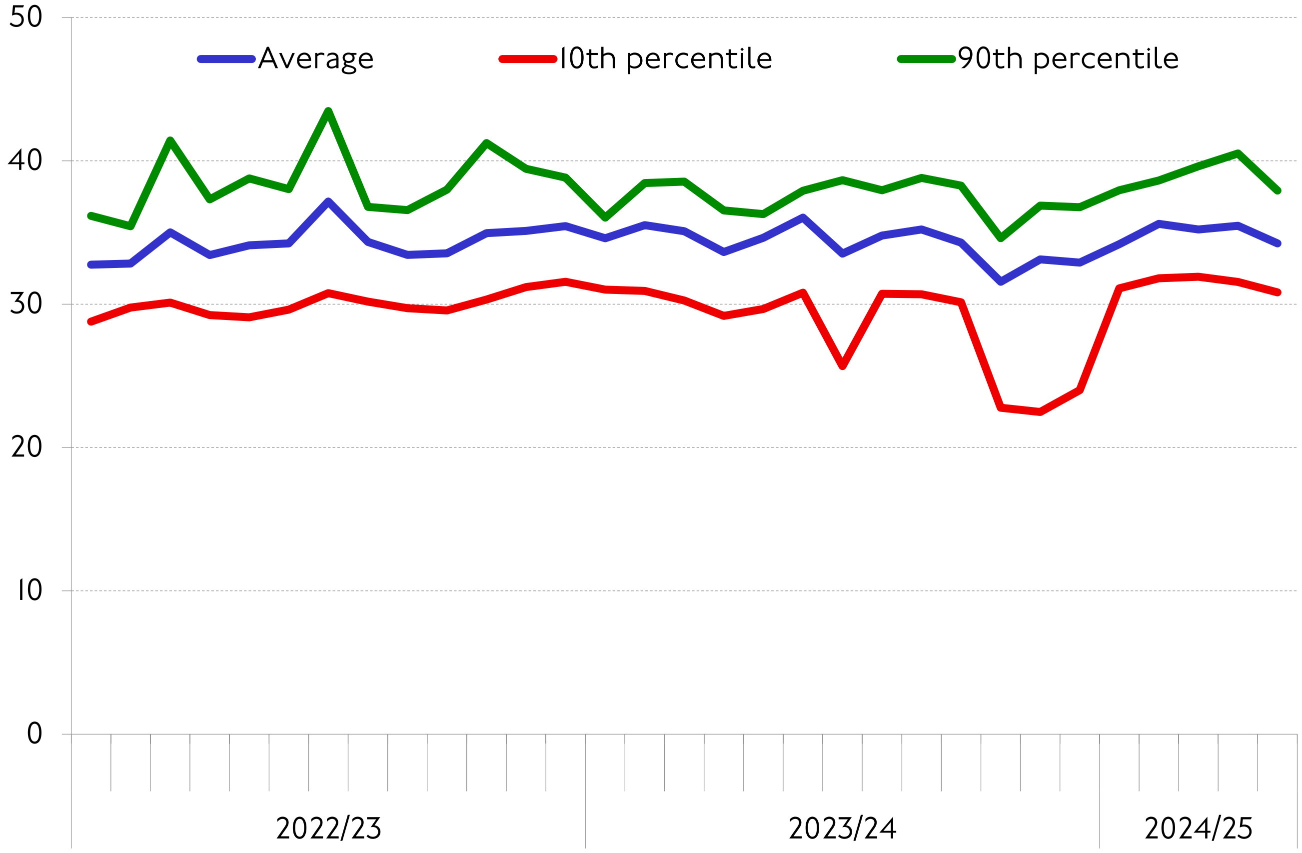


Source: TfL Strategic Analysis, Customer & Strategy, based on TfL operational data.

It is seen that the trend was broadly stable over the monitoring period, allowing for an element of post-pandemic recovery in the early months.

Historic reliability data is also available for route 108, which has suffered from unreliability at the Blackwall tunnels. Similar data will be available for the new bus routes in due course. Figure 5.6 shows the trend for TfL's bus journey time metric for route 108. Although broadly stable in terms of trend over the monitoring period, there is considerable variability which would be expected to reduce as the operational performance of the Blackwall Tunnels improves following the opening of the Silvertown Tunnel.

Figure 5.6 Average, 10th percentile and 90th percentile of the bus journey time metric (in minutes) for bus route 108, by financial period, from period 1 2022/23 until period 5 2024/25.



Source: TfL Strategic Analysis, Customer & Strategy, based on TfL service performance data.

5.6 Road danger

Road casualty statistics are collated by TfL and published in our Road safety data web pages. A dashboard is also available from which full details of reported collisions and casualties can be obtained. This includes the ability to make arbitrary selections based on location, road type, date range or collision/casualty characteristics (for example, vehicles involved). Data is typically subject to a nine-to-12-month verification lag as details of the collision and any subsequent inquiry are finalised. At the time of writing, verified data is available until the end of 2023 and provisional data until the end September 2024.

This data will continue to be updated as collisions occur after the scheme's opening. In time, this will allow detailed before/after comparisons, including at the individual road link level. However, the (statistically) relatively low incidence of collisions in the local area, combined with the data verification period, mean that meaningful before/after comparisons are unlikely to be possible until at least two years after the opening.

In the meantime, table 5.1 (taken from our dashboard) shows the total number of reported casualties (categorised into those receiving fatal, serious or slight injuries) in each of the three boroughs in the immediate vicinity of the new tunnel. The data covers the period between 6 January 2022 and 30 September 2024, reflecting the data verification lag, and is therefore subject to revision.

Table 5.1 Casualties resulting from road traffic collisions in each of the host boroughs, by severity, from 6 January 2022 until 30 September 2024.

Borough	Fatal	Serious	Slight	All
Newham	11	299	2,405	2,715
Tower Hamlets	10	422	2,605	3,037
Greenwich	6	289	1,702	1,997

Source: TfL Safety, Health and Environment.

5.7 Carbon dioxide emissions from road traffic

Context

Carbon dioxide emissions underlie global climate change and the Mayor of London has set an ambitious target for London to be net zero by 2030. Long-term, London-wide progress towards this goal is primarily monitored through the London Energy and Greenhouse Gas Inventory.

Carbon dioxide emissions from road traffic, which account for roundly one fifth of all locally generated carbon dioxide emissions across London, primarily reflect traffic volumes, measured in terms of aggregate vehicle kilometres. Secondarily, they reflect average traffic speeds (for example, congestion) and the technical composition of vehicles (such as body type – for example bus or van – and fuel type – for example petrol, diesel, hybrid-electric or zero-emission at the tailpipe). The first two of these factors (traffic volumes and speeds/congestion) will be comprehensively measured as part of the tunnel's monitoring programme. For the third factor (vehicle body type), partial data (primarily a light/heavy goods vehicle split) will be available.

Overall, the scheme is expected to result in a broadly neutral re-distribution of traffic across the area of influence, although this expectation needs to be appropriately confirmed through the monitoring. Change in overall traffic volumes would therefore be an indicator of changed carbon dioxide emissions, expected to be broadly proportionate.

In terms of average vehicle speeds, the scheme is expected to reduce congestion overall and this could be positive in terms of carbon dioxide emissions, since more consistent driving burns less fuel than low-speed or stop-start driving.

With regards to vehicle body type, the balance between different types of vehicle on the local network may be affected by factors such as the relative attractiveness of the new connectivity, for example to freight, given that the charging structure is vehicle type-specific. This may be a significant factor for carbon dioxide change calculations over the longer term.

In terms of vehicle technology type, the ongoing improvements to the vehicle fleet have been and will continue to be significant in terms of reducing overall carbon dioxide emissions from road traffic. This progress is reflected in published emissions factor toolkits used for carbon dioxide calculations. Background progress in this regard would mean that, all else equal, total carbon dioxide emissions from the same quantum of traffic would reduce year on year; and this effect should be significant over the monitoring period.

Approach

The calculation will therefore be based on observed aggregate traffic flows obtained through the traffic monitoring and will use established relationships between traffic flow/composition and carbon dioxide emissions. The traffic monitoring work on which this depends is focused on the more major roads in the area of influence, but also covers smaller links that could experience relatively large traffic changes, as identified through our model-based assessments of the scheme.

In calculating carbon dioxide emissions, it is relative change (on a like for like basis) that is most important, rather than accurately estimating the absolute totals, and therefore this 'partial network', carrying the majority of traffic in the area subject to traffic change as part of the scheme, will be appropriate. Baseline and initial post-opening calculations, which are most appropriately done on an annual total basis and therefore require these data as a prerequisite, will be published after the scheme opens.

5.8 Ambient noise

Context

Ambient noise monitoring is being carried out to satisfy the requirements set out in schedule 2 of the DCO for the scheme. Any ambient noise impacts from the scheme in operation will be a function of change in traffic levels, which provide a first means of assessing these impacts. Based on the Design Manual for Roads and Bridges (DMRB) thresholds, a 25 per cent change in traffic flow is required to bring about a noticeable one decibel (dB) change in noise. Generally, forecast traffic changes arising from the scheme are well within this margin, including thresholds being used to assess the need for traffic mitigation. Based on the modelling for the scheme, any noise impacts are expected to be localised and, with the agreement of the host boroughs, ambient noise monitoring is therefore focused on the immediate vicinity of the Silvertown Tunnel portals.

Approach

Initial ambient noise monitoring was completed for the 2019/20 financial year to provide a clear pre-construction baseline free of any construction-related noise. Noise monitoring was undertaken using permanently installed class I live L_{Aeq} remote access data logging sound level meters at seven sites in total, recording noise in the vicinity of the tunnel on a continuous basis. Data from the monitors was processed to provide a range of industry-standard noise metrics describing the local noise environment. Note that the early stages of the coronavirus pandemic and the associated lockdowns were a feature at the end of this monitoring period.

No further monitoring of ambient noise was undertaken during the tunnel's construction period, although construction noise itself was monitored under separate (contractor-led) arrangements. After the opening, TfL will repeat the 2019/20 measurements and compare them to the baseline readings.

Illustrative noise baseline

Tables 5.2 and 5.3 illustrate the data that form part of the noise baseline for the month of December 2019 at each of the seven sites. This data is shown as being representative of the data that will be available for the post-opening comparison.

Table 5.2 Selected metrics of weekday daytime (07:00-19:00) measured noise levels (in decibels) at the baseline monitoring sites, December 2019.

Site	National Grid reference	$L_{Aeq,T}$	$L_{A90,T}$	$L_{A10,T}$
NML01: Hoola building façade	TQ 39951 80729	66.9	58.8	68.5
NML02: Western Beach apartment building, Hanover Avenue	TQ 40092 80441	68.9	61.3	71.1
NML03: Pump Tower residential building, southern façade	TQ 40105 80744	65.2	54.7	66.9
NML04: Millennium School	TQ 39655 79083	71.4	64.2	73.1
NML05: Residential properties in the vicinity of the Pilot public house	TQ 39630 79414	54.4	50.0	55.0
NML06: Ravensbourne College	TQ 39294 80005	66.7	53.0	62.9
NML07: Faraday school eastern façade	TQ 39527 80740	62.7	53.6	62.2

Source: Arcadis, on behalf of Transport for London.
Note: The $L_{Aeq,T}$ index denotes the average (eq), 90th percentile (90) and 10th percentile (10) sound pressure (in decibels) over the specified time period (T), weighted to reflect the sensitivities of human hearing (A).

Table 5.3 Selected metrics of weekday night-time (23:00-07:00) measured noise levels (in decibels) at the baseline monitoring sites, December 2019.

Site	National Grid reference	$L_{Aeq,T}$	$L_{A90,T}$	$L_{A10,T}$
NML01: Hoola building façade	TQ 39951 80729	61.6	52.1	64.0
NML02: Western Beach apartment building, Hanover Avenue	TQ 40092 80441	65.1	52.4	68.0
NML03: Pump Tower residential building, southern façade	TQ 40105 80744	58.8	49.5	60.7
NML04: Millennium School	TQ 39655 79083	67.7	58.1	69.9
NML05: Residential properties in the vicinity of the Pilot public house	TQ 39630 79414	51.0	48.5	51.5
NML06: Ravensbourne College	TQ 39294 80005	55.1	48.9	56.0
NML07: Faraday school eastern façade	TQ 39527 80740	53.9	48.6	54.6

Source: Arcadis, on behalf of Transport for London.
Note: The $L_{Aeq,T}$ index denotes the average (eq), 90th percentile (90) and 10th percentile (10) sound pressure (in decibels) over the specified time period (T), weighted to reflect the sensitivities of human hearing (A).

Understanding noise impacts

To ensure noise impacts are properly understood, TfL will appoint an independent noise expert to carry out an annual review of the noise monitoring data. TfL acknowledges that identifying different effects on noise from the scheme in operation and those arising from other unrelated activities is likely to be complex. Therefore, in addition to the noise monitoring data presented within the annual monitoring reports, the flows, composition (including the proportion of heavy vehicles) and speed of the traffic through the tunnels will also be considered by the independent noise specialist.

TfL will also have regard to any long-term noise monitoring undertaken by the local authorities or other statutory bodies within the local area of influence or in the vicinity of the tunnel portals where this is appropriate and representative. The noise monitoring will continue for a minimum of three years after the scheme's opening.

5.9 Other road network and travel impacts: forward look

Table 5.4 summarises the indicative timelines over which consolidated post-opening data relating to the above topics will become available. Emerging comparisons will be published as they become available on the STIG website in the first instance.

Table 5.4 Indicative timescales for post-opening data availability and baseline comparisons.

Topic	Full baseline comparisons
Cycle shuttle bus demand	Not applicable
Cycling in the vicinity of tunnel (TfL's regular counts)	Late 2025
Cross-river cycle counts	Late 2025
Local bus routes' demand	Not applicable
Local bus routes' service performance	Not applicable
Road collisions/casualties	Mid-2026 onwards
Road traffic carbon dioxide emissions	Mid-2026 onwards
Ambient noise	Mid-2026 onwards

Source: Transport for London.

6. Air quality

6.1 Introduction

Changes to traffic flows on the road network in the vicinity of the new tunnel could affect air quality locally and it is important that any such impacts are fully understood.

As part of the development of proposals for the scheme, the potential air quality impacts were rigorously examined. The DCO application in 2016 included a full Environmental Impact Assessment; and an Environmental Statement was prepared. This report included a robust assessment of air quality impacts which concluded that, for most air quality pollutants, the effects of the scheme would be negligible and therefore not significant. However, through the examination there was some uncertainty raised regarding the forecast levels of nitrogen dioxide (NO_2). To remedy this, requirements to monitor air quality (specifically NO_2 only) were included in the DCO and the MMS for the scheme. This has taken the form of an overlay of additional scheme-specific monitoring on top of business-as-usual air quality monitoring in London.

The air quality monitoring described below primarily responds to these requirements and is framed in terms of the UK National Air Quality Strategy objective values for NO_2. Briefly, these stipulate a not-to-be-exceeded annual mean concentration of NO_2 of $40\mu g{\cdot}m^{-3}$, together with a short-term objective for $200\mu g{\cdot}m^{-3}$ as a one-hour mean not to be exceeded more than 18 times per calendar year. However, given the overall efforts to improve air quality across London and the recommendations from the World Health Organisation (WHO) for more stringent air quality standards (guidelines), the findings will be of more general interest.

Particulate matter (PM_{10}/$PM_{2.5}$) concentrations are not directly measured as part of the scheme's monitoring but are included in wider business-as-usual monitoring across London.

Finally, the impact of the traffic changes associated with the tunnel on carbon dioxide emissions will be assessed separately, as described above.

6.2 Recent air quality trends in London

Air quality in London has improved significantly over recent years. This largely reflects specific policies of the Mayor of London, such as the phased implementation of the Ultra Low Emission Zone (ULEZ), overlaid on a backdrop of technical improvements to the emissions performance of the road vehicle fleet, such as electrification. The recent London-wide Ultra Low Emission Zone One Year Report contains a good summary of the combined impact of these recent initiatives and the reduction in typical NO_2 concentrations across London that have resulted from them.

The latest Air Quality in London report from the Greater London Authority covering the period 2016-2024 identified the following key trends, which serve as a backdrop to the scheme's monitoring and paint an encouraging picture of improvement:

- In 2023, average annual concentrations of NO_2 in London dropped to the lowest levels ever recorded, lower even than the first year of the coronavirus pandemic.

- Since the current Mayor took office in 2016, monitoring from the network of reference grade air quality monitors across London shows that NO_2 concentrations have reduced across London, with average roadside reductions of 65 per cent, 53 per cent and 45 per cent since 2016 at central, inner, and outer monitoring locations, respectively. Across London as a whole, average annual roadside NO_2 concentrations have reduced by nearly half (49 per cent) since 2016.
- The average roadside concentration across all active monitoring sites exceeded the NAQS annual mean objective value of $40\mu g{\cdot}m^{-3}$ from 2016 to 2019 in central, inner and outer London. Since 2020, however, the average across all active sites has been below the objective value.
- While significant reductions in NO_2 concentrations have been recorded, none of the major roads or educational establishments in London met the WHO annual mean air quality guideline of $10\mu g{\cdot}m^{-3}$ for NO_2, and this is predicted to still be the case by 2025 and 2030. Further action will therefore be necessary if London is to meet its target of achieving the new WHO guidelines as soon as possible.

In terms of the Silvertown Tunnel scheme, this overall background improvement means that the risk of the tunnel and its associated road traffic changes leading to an exceedance of the NAQS objective for NO_2 has reduced, relative to expectation, from when the proposals for the tunnel were developed.

6.3 Scope of the monitoring

New air quality monitoring capacity

To meet the MMS requirements, and following agreement of the STIG representatives, 38 triplicate passive diffusion tubes were installed across the boroughs of Newham, Greenwich, Tower Hamlets, Lewisham and Southwark to provide information on NO_2 levels across the wider road network that may be affected by changes in traffic levels associated with the scheme. The diffusion tubes were installed in December 2020 at roadside sites close to the tunnel entrances, on the approaching road links and on key routes north and south of the Thames, thus fulfilling the DCO baseline monitoring requirement of three years before the opening.

The environmental statement for the tunnel concluded that the greatest potential air quality impact would be on residential properties at the Hoola Tower on Tidal Basin Road (Newham), which is located adjacent to the northern portal of the new tunnel. An additional six diffusion tube locations were therefore placed around this building to further understand the potential air quality concentrations and impacts in this area.

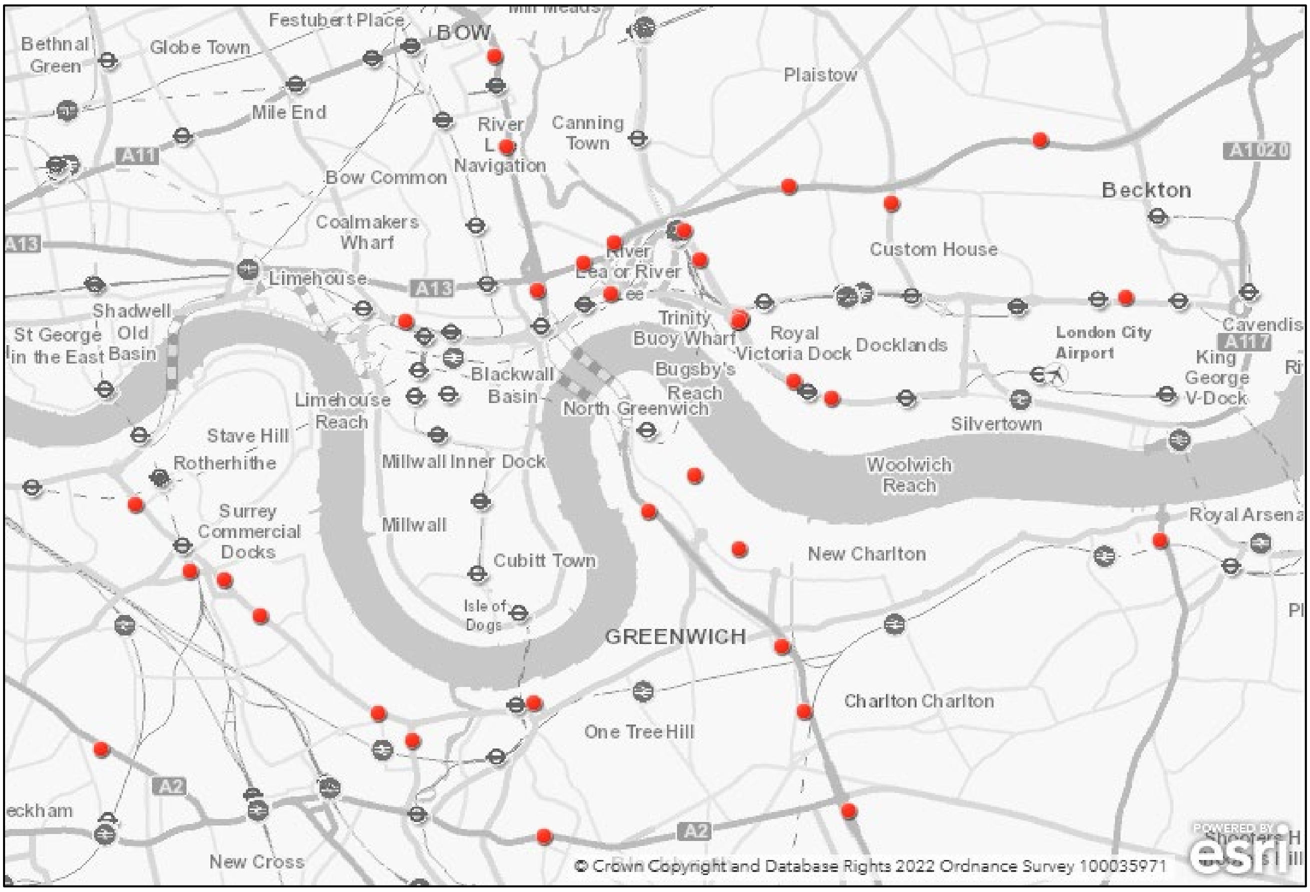
In addition, three continuous monitoring sites with oxides of nitrogen (NO_x) analysers were installed close to the tunnel entrances at roadside locations where the scheme impacts are likely to be greatest: at Tunnel Avenue (Londonair site ID TL4) in Greenwich and at the Hoola Tower (TL5) and at Britannia Gate (TL6) in Newham.

In line with the MMS and DCO requirements, NO_x/NO_2 was monitored for a minimum of three years prior to tunnel's opening and will be monitored for a minimum of three years after the opening to provide data to inform baseline conditions and determine the scheme's impacts. Monitoring began at sites TL4 and TL6 in December 2020 and at TL5 in March 2021 due to additional work required to provide power to the monitor. All three stations have reference standard equipment with chemiluminescence analysers for the measurement of NO_x and NO_2 and have co-located diffusion tube monitoring for comparison purposes.

There are also some local authority continuous monitoring sites located close to the tunnel. Data from these sites is also used to provide a fuller coverage of the tunnel's impacts. In addition, borough diffusion tube sites and [Breathe London](#) monitors near the tunnel can also be accessed to provide more information.

The locations of all these monitoring sites are shown in figure 6.1. Full technical and locational details of these (continuous) monitoring sites (both existing and scheme-specific), along with monitoring data as it emerges, can be found on the [Londonair website](#).

Figure 6.1 Air quality monitoring sites associated with the Silvertown Tunnel.



Source: Transport for London.

A note on timings: data availability and reporting

Currently, three annual, pre-opening [Air Quality Baseline Monitoring contractor reports](#) have been published covering the calendar years 2021, 2022 and 2023. This fulfils the three-year pre-opening monitoring requirement, but there will be interest also in trends during 2024, particularly since these reflect the consolidated impacts of the expansion of the Ultra Low Emission Zone to outer London from late summer 2023 and trends in early 2025, just before the tunnel's opening. The consolidation of this data is however subject to the timing constraints described above. Given these constraints, we expect to be able to publish a consolidated report for 2024 in late summer 2025.

6.4 Baseline NO_2 trends at scheme-related continuous monitoring sites

The headline results at the three scheme-specific continuous monitoring sites show that measured NO_2 concentrations in 2023 complied with the NAQS objective values at the locations close to the scheme (table 6.1).

Table 6.1 Summary of air quality (oxides of nitrogen) performance at the three scheme-specific continuous monitoring sites, 2023.

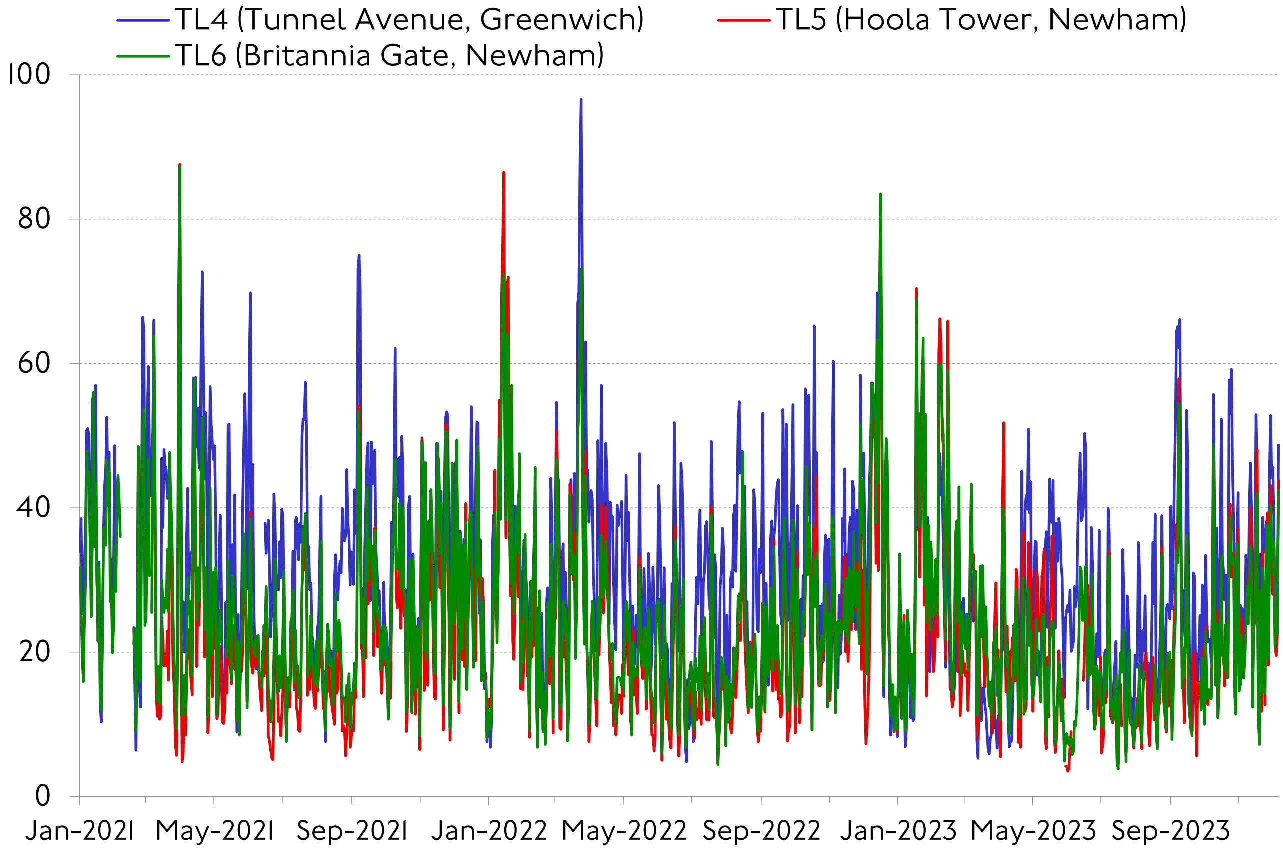
Statistic	Tunnel Avenue (TL4)	Hoola Tower (TL5)	Britannia Gate (TL6)	NAQS aim
Annual mean NO_2 concentration ($\mu g{\cdot}m^{-3}$)	26.4	21.3	21.7	40
Annual mean NO_x concentration ($\mu g{\cdot}m^{-3}$)	47.7	32.5	36.9	Not applicable
Annual mean NO concentration ($\mu g{\cdot}m^{-3}$)	13.9	7.3	9.9	Not applicable
Instances of one-hour NO_2 concentrations over $200\mu g{\cdot}m^{-3}$	0	0	0	18
Maximum one-hour NO_2 concentration ($\mu g{\cdot}m^{-3}$)	123.9	120.9	94.3	Not applicable
Data capture rate (%)	92.9	89.6	89.9	Not applicable

Source: AECOM, on behalf of Transport for London.
Notes: A minimum data capture rate of 85 per cent is dictated by Defra for data quality purposes. | The chemical conversion of NO_x to NO_2 in the air is a dynamic process affected by several wider atmospheric factors which vary over time. This affects the rate and persistence of the conversion and means that total NO_x levels generally correlate better with emission sources (like traffic) than NO_2, although NO_2 is the regulated pollutant.

In 2023, annual mean concentrations at monitoring sites TL4, TL5 and TL6 decreased by $6.0\mu g{\cdot}m^{-3}$ (18.5 per cent), $1.5\mu g{\cdot}m^{-3}$ (6.6 per cent) and $2.9\mu g{\cdot}m^{-3}$ (11.8 per cent), respectively, compared to 2022. One-hour concentrations did not exceed $200\mu g{\cdot}m^{-3}$ at any of the sites, with a maximum hourly concentration of $123.9\mu g{\cdot}m^{-3}$ measured at TL4. Measured concentrations of total oxides of nitrogen (NO_x) and nitrogen oxide (NO) at each of the sites are also given for completeness (see also the footnote below the table).

From 2021 to 2023 the annual average NO_2 concentrations observed at TL4, TL5 and TL6 decreased by 23.0 per cent, 2.3 per cent and 17.8 per cent, respectively. Figure 6.2 shows the available time series for all three sites, from which the overall trend of steady decrease overlaid on a predominantly and expected seasonal pattern is evident.

Figure 6.2 Daily mean NO_2 concentration (in µg·m^{-3}) at the three scheme-specific continuous monitoring sites, from January 2021 until December 2023.



Source: AECOM, on behalf of Transport for London.

6.5 Baseline trends at established local authority continuous monitoring sites

There are three local authority roadside continuous monitoring sites in the vicinity of the scheme: TH4 Blackwall (Tower Hamlets), GN6 John Harrison Way (Greenwich) and GR8 Woolwich Flyover (Greenwich). There is also an 'urban background' monitoring site at Wren Close (Newham, site ID NM3) providing representative background measurements of NO_2 away from the influence of major roads. These sites are long-established and therefore provide a longer time series of data than the scheme-specific sites.

In 2023 there were no exceedances of the annual mean NAQS objective for NO_2 at any of these sites. The one-hour mean NO_2 NAQS objective for NO_2 was also met at all sites. Table 6.2 sets out the longer-term trend in terms of annual mean NO_2 concentration for all these sites. Measured concentrations at these sites have decreased since 2018 by between 31 and 44 per cent; and the overall trend of progressive reduction in concentrations at these sites is evident.

Table 6.2 Annual mean NO_2 concentration (in µg·m^{-3}) at the local authority continuous monitoring sites, by year, from 2018 until 2023.

Year	Blackwall (TH4)	John Harrison Way (GN6)	Woolwich Flyover (GR8)	Wren Close (NM3)
2018	50.7	(33.7)	56.7	28.5
2019	47.4	32.9	52.3	28.0
2020	38.6	25.6	43.2	20.3
2021	37.4	25.3	40.3	20.7
2022	(36.5)	23.2	40.0	21.8
2023	28.3	22.2	(32.0)	19.8
Change from 2018 to 2023	-44%	-34%	-43%	-31%

Source: AECOM, on behalf of Transport for London.
Note: Values in brackets denote data capture rates below 85 per cent. For GN6 in 2018 this was 43 per cent. For TH4 in 2022 this was 62 per cent. For GR8 in 2023 this was 55 per cent.

6.7 Scheme diffusion tube monitoring sites

Of the 38 diffusion tube monitoring sites operated as part of the scheme's monitoring, the annual mean NO_2 concentrations complied with the NAQS objectives at all sites in 2023. Across all diffusion tube sites there was an average reduction in NO_2 concentration of 6.7 per cent, with reductions at 37 of the 38 sites and an increase at one site (DT20 Lower Road). This small increase was likely due to increased emissions associated with traffic congestion at the temporary traffic lights which were installed for several months to allow for the construction of the new cycle lane for Cycleway 4. A maximum concentration of 39.9µg·m^{-3} was recorded at site DT3 (Douglas Road, Newham Way), this being a small reduction of 3.6 per cent compared to 2022 (see table 6.3) and just below the NAQS objective value.

Two diffusion tube monitoring sites (DT3 and DT24) exceeded the NAQS objective in 2022. The NO_2 concentration at DT3 decreased from 41.4µg·m^{-3} in 2022 to 39.9µg·m^{-3} in 2023, a level below the objective. The concentration at DT24 also decreased, from 41.1µg·m^{-3} to 37.7µg·m^{-3} in 2023, which is also below the NAQS objective. The average reduction in annual mean NO_2 concentrations across all sites between 2022 and 2023 was 6.7 per cent (2.0µg·m^{-3}).

Further locational and other technical details, including quality assurance, of these sites can be found in the Air Quality Baseline Monitoring contractor reports.

Table 6.3 Selected metrics of NO_2 monitoring at the scheme-specific diffusion tube sites, by site, 2022 and 2023.

Site	Raw 2023 annual mean NO_2 concentration ($\mu g \cdot m^{-3}$)	Triplicate data capture rate (%)	Bias-adjusted 2023 annual mean NO_2 concentration ($\mu g \cdot m^{-3}$)	Bias-adjusted 2022 annual mean NO2 concentration ($\mu g \cdot m^{-3}$)	Change from 2022 to 2023 (%)
DT1	25.6	100.0	22.0	24.3	-9.5
DT2	37.7	83.3	32.4	34.8	-6.9
DT3	46.4	100.0	39.9	41.4	-3.6
DT4	32.6	100.0	28.0	30.8	-9.0
DT5	23.9	100.0	20.6	21.9	-6.1
DT6	28.7	100.0	24.7	26.9	-8.4
DT7	31.5	91.7	27.1	28.4	-4.8
DT8	31.9	100.0	27.4	29.4	-6.6
DT9	39.9	100.0	34.3	34.9	-1.7
DT10	28.2	100.0	24.3	26.5	-8.4
DT11	36.7	100.0	31.6	34.4	-8.2
DT12	40.3	100.0	34.6	36.8	-6.0
DT13	25.7	83.3	22.1	25.8	-14.3
DT14	26.9	91.7	23.1	23.6	-2.2
DT15	27.1	100.0	23.3	26.8	-13.2
DT16	30.1	100.0	25.9	27.5	-5.9
DT17	42.9	100.0	36.9	38.9	-5.1
DT18	37.3	100.0	32.1	35.3	-9.2
DT19	35.5	100.0	30.5	35.8	-14.7
DT20	30.6	100.0	26.3	26.1	0.8
DT21	26.7	100.0	23.0	30.3	-24.1
DT22	30.1	66.7	24.8	27.0	-7.9
DT23	39.4	100.0	33.8	35.8	-5.4
DT24	43.8	100.0	37.7	41.1	-8.4

[Table continues on the next page]

Site	Raw 2023 annual mean NO_2 concentration (µg·m^{-3})	Triplicate data capture rate (%)	Bias-adjusted 2023 annual mean NO_2 concentration (µg·m^{-3})	Bias-adjusted 2022 annual mean NO2 concentration (µg·m^{-3})	Change from 2022 to 2023 (%)
DT25	26.9	100.0	23.2	24.3	-1.9
DT26	26.4	100.0	22.7	23.6	-1.8
DT27	34.1	100.0	29.3	32.0	-8.2
DT28	36.0	100.0	31.0	31.6	-4.8
DT29	25.7	100.0	22.1	22.5	-9.0
TL4	33.3	75.0	28.6	31.1	-8.2
TL5	30.4	83.3	26.1	25.8	-4.8
TL6	27.0	100.0	23.2	25.5	-9.0

Source: AECOM, on behalf of Transport for London.

Due to the long exposure periods needed for diffusion tube sampling it is not possible to make direct comparisons against the one-hour mean NO_2 concentration NAQS objective. As a proxy, the Defra suggests using an annual mean NO_2 concentration of 60µg·m^{-3} for diffusion tube measurements to determine the likelihood of the short-term NAQS objective being achieved or exceeded. There were no diffusion tube sites where the annual mean NO_2 concentration exceeded 60µg·m^{-3} and therefore the one-hour mean NO_2 NAQS objective is expected to have been met.

Seasonal patterns in these measurements, as well as local incidents that are thought to have affected the results at specific sites are detailed in the Air Quality Baseline Monitoring contractor reports.

6.8 Additional diffusion tube monitoring at Hoola Tower

In addition to the monitoring locations described above, NO_2 diffusion tubes were also located around the Hoola Tower on Tidal Basin Road (Newham). The potential for increases in NO_2 concentrations at this location had been identified given the proximity to the tunnel's northern portal and the changes in the local road network related to the scheme. Data from these supplementary locations provides additional information on NO_2 concentrations around this building.

The data in table 6.4 shows that the measured 2023 concentrations at all diffusion tube sites around the Hoola Tower were below the NAQS objective value. In 2023, NO_2 concentrations were highest at site Hoola 6, located to the east of the West Tower.

Table 6.4 Selected metrics of NO_2 monitoring at the scheme-specific, supplementary Hoola Tower diffusion tube sites, by site, 2022 and 2023.

Site	Raw 2023 annual mean NO_2 concentration ($\mu g{\cdot}m^{-3}$)	Triplicate data capture rate (%)	Bias-adjusted 2023 annual mean NO_2 concentration ($\mu g{\cdot}m^{-3}$)	Bias-adjusted 2022 annual mean NO_2 concentration ($\mu g{\cdot}m^{-3}$)	Change from 2022 to 2023 (%)
Hoola 1	28.9	100.0	24.9	25.1	-0.6
Hoola 2	29.6	100.0	25.4	26.3	-3.1
Hoola 3	29.1	91.7	25.0	25.7	-3.0
Hoola 5	30.8	100.0	26.5	27.9	-5.0
Hoola 6	32.9	75.0	28.3	29.1	-3.0
Hoola 10	29.6	100.0	25.6	27.3	-6.5

Source: AECOM, on behalf of Transport for London.

6.9 Summary

In line with the more general trend of air quality improvement in London over recent years, NO_2 concentrations measured at sites within the vicinity of the new tunnel consistently registered levels below the NAQS objective towards the latter part of the baseline period (2023). The pace of improvement has also been more rapid than previously envisaged, reflecting progress with the Ultra Low Emission Zone. However, at some locations the margin of compliance in 2023 was relatively small, meaning that they may still be sensitive to traffic changes arising from the scheme. Furthermore, air quality concentrations are known to vary both seasonally and from year to year due to different meteorological conditions and therefore a degree of exceedance risk in terms of the NAQS objectives remains.

Finally, while significant reductions in NO_2 concentrations have been recorded, none of the major roads or educational establishments in the vicinity of the tunnel met the WHO annual mean air quality guideline for NO_2 of $10\mu g{\cdot}m^{-3}$ and this is predicted to still be the case by 2025 and 2030. It is therefore desirable to continue to work towards lower pollution concentrations and any impacts from the tunnel should be seen in that context.

In terms of the specifics of the baseline, the following are the key findings:

- The annual mean NO_2 concentrations at all three scheme-specific continuous monitoring sites complied with the NAQS objective in 2023, with a maximum concentration $26.4\mu g{\cdot}m^{-3}$ recorded at TL4 (Tunnel Avenue), which was a reduction of six per cent compared to 2022.
- The results of the diffusion tube monitoring during 2023 indicate that annual mean NO_2 concentrations complied with the NAQS objective at all 38 monitoring sites, including those in the vicinity of the tunnel. A maximum concentration of $39.9\mu g{\cdot}m^{-3}$ was recorded at DT3 (Douglas Road, Newham Way), which was a small reduction of 3.6 per cent compared to 2022.

- The concentrations at 37 out of the 38 scheme diffusion tube monitoring locations reduced from 2022 to 2023, while concentrations at one site increased. Overall, across all sites there was a reduction in concentrations of $2.0 \mu g \cdot m^{-3}$ (6.7 per cent) from 2022, and a reduction of exceedances of the NAQS objective from two to none in 2023.

It is expected that the annual mean NO_2 concentrations would have continued to decrease during 2024 due to the ongoing vehicle fleet improvements reflecting London-wide measures such as the ULEZ and wider interventions like the electrification of the vehicle fleet. The traffic changes observed through the monitoring described in section 4 above, the WHO guidelines and the ongoing effort to improve air quality in London will provide context for interpreting any post-opening trends.

6.10 Air quality monitoring: forward look

As described above, air quality results take some time to emerge in meaningful form; and further time is required for any adverse change to be confidently attributed to local traffic change. In the interim, observed longer-term traffic change will be a guide to any potential adverse air quality impacts.

Reflecting the annualisation requirement of NAQS objectives, a fourth contractor air quality baseline monitoring report will be produced for the fourth baseline year (to the end of 2024). This is expected in later summer 2025. Data for the immediate baseline period before the scheme's opening in early 2025, which will likely provide the clearest view of the immediate pre-opening air quality conditions, will not be available in consolidated form until the fifth contractor report, expected in mid-2026. The following measures will partially address this and give TfL a guide to tunnel-specific impacts, including any features that may require considering mitigation.

Reference will be made to any relevant emerging results on the Londonair and Breathe London websites over the immediate post-opening period. Although both these sources are subject to technical limitations for short-term data, they should highlight significant and unexpected changes. The diffusion tube results may also provide an early guide to any significant changes, although these are less accurate than the continuous monitors and data from the two sources needs to be reconciled, as is standard practice, over minimum periods of one year.

After the opening in 2025, additional analysis will be undertaken with the aim of isolating the impacts of the scheme, which may include the use of statistical analysis, the removal of seasonal and meteorological influences, the consideration of wider London data and trends interpretation. TfL intends to appoint an independent air quality expert to help guide this analysis and to provide transparency.

More generally, after the opening, TfL will continue to monitor NO_x/NO_2 for a minimum of three years using the same monitors (type, location, etc.) as used for the baseline monitoring. Should the post-opening monitoring suggest that air quality is deemed to have materially worsened as a result of the new tunnel, requiring mitigations to be considered, the relevant local authorities (via the STIG) will be consulted to help determine the appropriate action.

7 Social and economic impacts

7.1 Introduction

A key aim of the new tunnel is to improve cross-river connectivity and journey time reliability in a part of east London where the river forms a significant natural barrier to social and economic interaction and existing cross-river connections are limited.

Detecting and attributing these benefits will be challenging, given the timescales over which they will develop, and the range of other factors separate from the tunnel that influence social and economic wellbeing (for example, general economic trends). Furthermore, in the pre-opening period businesses and residents of the area around the tunnel will have adapted to their location, either chosen it for specific reasons or developed travel patterns that reflected the contemporary transport offer. This both forms the context for the development of benefits and means that there will likely be considerable inertia in the clear expression of longer-term benefits, for example employment change and improvements to wider social and economic deprivation.

A pragmatic approach has therefore been adopted to understanding the social and economic impacts associated with the scheme, which will attempt to discern the short-to-medium term impacts on businesses and people in the local area. Baseline data has been collected for a three to four years during the pre-opening period and this will be repeated in the post-opening period for at least the first three years. The summary below relates to the pre-opening baseline dataset, against which future findings after the opening of the tunnel can be compared.

7.2 Scope of the monitoring

There are three main elements to the social and economic monitoring:

- Analysis of available third-party social and economic trend data (secondary data) relating to the area of influence of the tunnel, set against wider trends in other parts of London, also revealed by this data.
- Bespoke surveys of local businesses (businesses surveys).
- Bespoke surveys of local residents (residents surveys).

Secondary data analysis

This involves collating and analysing available third-party data related to social, economic and business trends and wellbeing in the area of the tunnel, with a focus on those likely to be related to, or influenced by, transport and travel. These datasets are summarised in tables 7.1, 7.2 and 7.3 below.

Table 7.1 Secondary data sources related to economic trends.

Name	Source	Level of detail [note 1]	Data used for the 2020 wave	Data used for the 2023 wave	Data used for the 2024 wave
Claimant count	ONS Nomis	LSOA	2019	2022	2022
Employees (total and full time), by two-digit SIC2007 sector and sector group	BRES Nomis	LSOA	2019	2022	2023
Business counts (by employment size band), by two-digit SIC2007 sector and sector group	IDBR Nomis	MSOA	2019	2022	2023
Residential prices and sales (mean and median values)	ONS HM Land Registry	LSOA	Until 2019	Until 2022	Until 2022
Net equivalised household income (before and after housing costs)	ONS	MSOA	2018	2020	2020
Housing affordability, housing market	ONS	MSOA	2018	2020	2020
Business floorspace	VOA [note 2]	LSOA	2010-2020	2010-2023	2010-2023
Development data	LDD [note 3]	Postcode	Until 2019	Until 2023	Until 2024

Source: Arcadis and Steer, on behalf of Transport for London.
[Note 1] Output Areas (OAs), Lower-layer Super Output Areas (LSOAs) and Middle-layer Super Output Areas (MSOAs) are small area geographies used in the 2021 census of population.
[Note 2] Valuation Office Agency
[Note 3] London Development Database

Table 7.2 Secondary data sources related to social trends.

Name	Source	Level of detail [note 1]	Data used for the 2020 wave	Data used for the 2023 wave	Data used for the 2024 wave
Population density	ONS	OA	2019	2020	2022
Population change between 2009, 2014 and 2019	ONS	LSOA	Until 2019	Until 2020	Until 2022
Population by age (and specific under 18 and over 65 groups)	ONS	OA	2019	2020	2022
Ethnicity	ONS	LSOA	2011 (Census)	2021 (Census)	2021 (Census)
Index of Multiple Deprivation	MHCLG [note 2]	LSOA	2019	2019	2019
Pupil numbers and characteristics	School census	OA	2020	2023	2024

Source: Arcadis and Steer, on behalf of Transport for London.
[Note 1] Output Areas (OAs), Lower-layer Super Output Areas (LSOAs) and Middle-layer Super Output Areas (MSOAs) are small area geographies used in the 2021 census of population.
[Note 2] Ministry of Housing, Communities and Local Government

Table 7.3 Secondary data sources related to transport trends.

Name	Source	Level of detail [note 1]	Data used for the 2020 wave	Data used for the 2023 wave	Data used for the 2024 wave
Cross-Thames commutes (people living in/commuting to the area)	2021 census Nomis	OA	2011	2011	2011
Transport Classification of Londoners (TCoL)	TfL	OA	2015	2015	2015
Public Transport Access Level (PTAL)	TfL	100m grid OA LSOA	2015	2023	2023
Travel to work data, by mode	2011 and 2021 census Nomis	MSOA	2011	2011	2011
London Travel Demand Survey (LTDS)	TfL	London residents	2017-2019	2022/23	2023/24

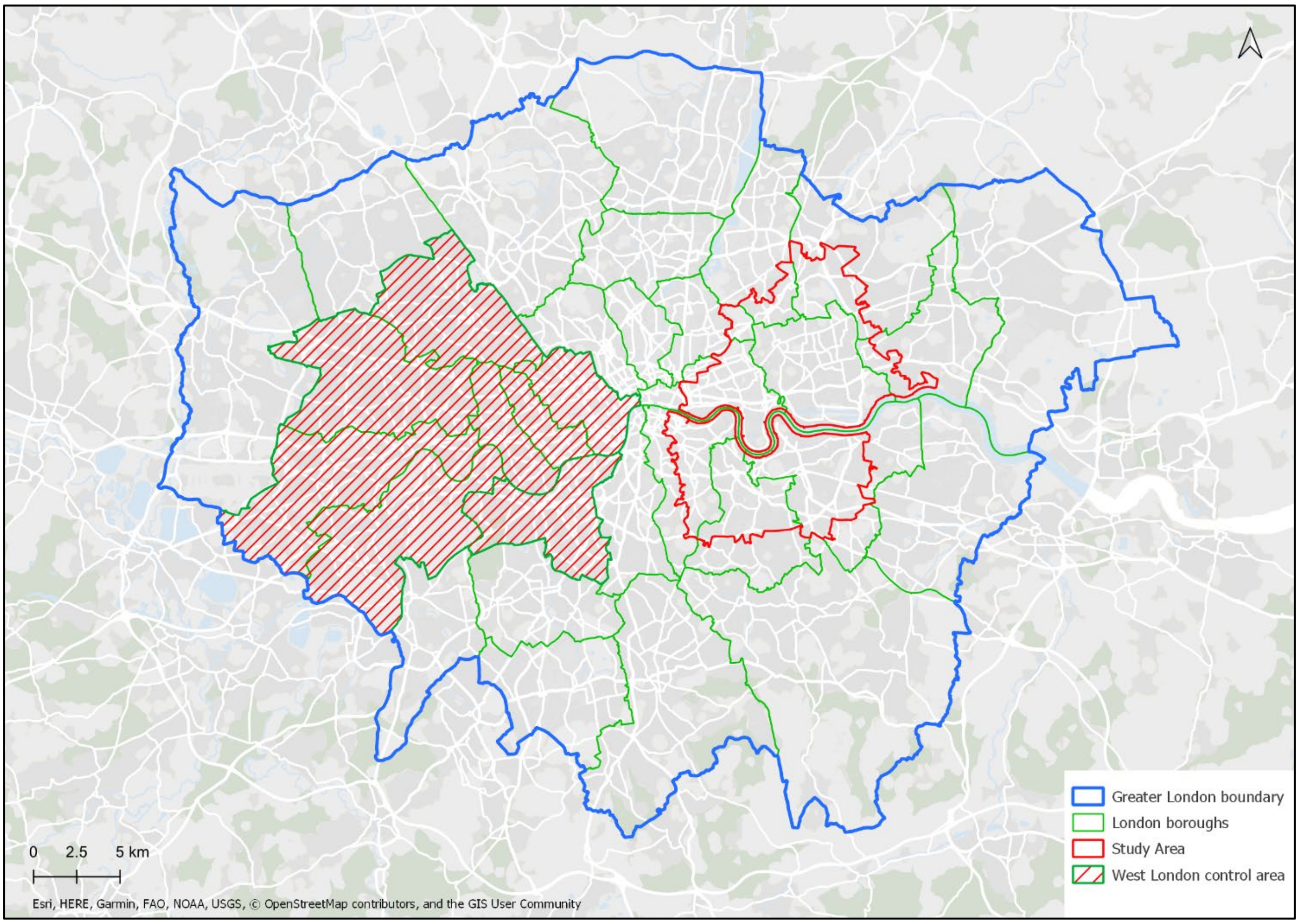
Source: Arcadis and Steer, on behalf of Transport for London.
[Note 1] Output Areas (OAs), Lower-layer Super Output Areas (LSOAs) and Middle-layer Super Output Areas (MSOAs) are small area geographies used in the 2021 census of population.

From an impacts monitoring perspective there are several limitations:

- Few of these indicators are likely to be significantly affected by the new tunnel over the short term. The main value of the tunnel is to contribute to their wider positive development over the long term.
- Another is the currency and the update frequency of many of the datasets. The decennial census, for example, from which population change could be understood in detail, is not expected to be updated until 2031, outside the scope of the tunnel monitoring programme. Many indicators are also not updated annually, often with a significant lag. And so, events like the coronavirus pandemic of the early 2020s are still the predominant factor influencing some of the most recent indicators. These indicators will primarily therefore provide context for the understanding of the longer-term impacts of the tunnel, rather than direct indicators of it.

The analysis is undertaken at the finest level of geographical and/or temporal disaggregation permitted by the data, which in many cases will be limiting). Figure 7.1 shows the study area (for social and economic impacts) in east London, which is based on the area of influence of significant tunnel effects (see above). Generally, however, the data sources cover a wider geographical area than that influenced by the tunnel, which permits the direct comparison of trends in the area of influence with those in other locations unaffected by the tunnel.

Figure 7.1 Silvertown Tunnel area of influence and west London comparator area.



Source: Arcadis and Steer, on behalf of Transport for London.

Ideally, a control area would be as similar as possible in terms of social and economic composition to the area of influence of the tunnel, yet sufficiently distant from it to be nominally unaffected by it. In this way, differences in trend between the two areas could, subject to further analysis, reflect the impact of the tunnel. However, the heterogeneity of Greater London and the unique nature of the river environment around the tunnel mean that such an idealised control area is not available. A pragmatic approach has therefore been adopted to the comparison of trends. A comparator area has been identified in the form of a group of west London boroughs straddling the river (figure 7.1). However, the barrier to interaction presented by the river there is less and the social and economic circumstances are different. Therefore, while this is expected to offer a useful comparison, it is not thought to be suitable (in isolation) as a formal control area.

Because the secondary data generally allows aggregation to different geographies up to and beyond the Greater London level, it is however possible to compare trends observed in the area around the tunnel with a variety of geographies appropriate to the scale of impacts being considered, as permitted by the data. In this way, for example, changes in disaggregate Indices of Multiple Deprivation in the relatively deprived areas around the tunnel can be set against changes in other deprived areas in London, trends in inner London or Greater London as a whole, and even relatively deprived areas nationally to put the observed change locally into its widest context.

Primary surveys of local businesses

These are sampled to be broadly representative of the businesses' population of the area of influence of the tunnel. For the baseline, three survey waves (autumn 2021, 2023, 2024) were carried out. These achieved sample sizes of around 300, 400 and 500 businesses, respectively, giving a total consolidated baseline sample of 1,203 businesses across the three survey years.

These surveys, conducted by telephone with a suitable representative of each business, provide a picture of the businesses' activities and wellbeing, travel behaviour and key issues that the businesses experience associated with their location. The surveys also gathered information about the businesses' awareness of the new tunnel over the baseline period. This element of the survey will be adapted to look at specific aspects of post-opening businesses' usage.

Primary surveys of local residents

These are sampled to be broadly representative of the resident population of the area of influence of the tunnel. For the baseline, three waves (autumn 2021, 2023, 2024) were carried out. These achieved sample sizes of 1,096, 1,027 and 1,098 residents, respectively, giving a total consolidated baseline sample of 3,221 individual residents across the three survey years.

These surveys, conducted by telephone with a suitable member of each sampled household, provide information about the socio-economic wellbeing and travel pattens of local residents, which can be compared with similar data after the opening that can be expected to reveal key changes: in the shorter term, for local travel and, over the longer term, for aspects of social and economic wellbeing (such as employment) affected by transport provision.

Both the businesses' and residents' surveys are cross-sectional, conducted with a different (although broadly representative) sample each year. This means that they do not track the behaviour of specific businesses or people over time. It is planned to conduct a minimum of three further surveys in autumn 2025, 2026 and 2027 to gather data reflecting the post-opening conditions.

It is important to realise that all the material that is available to date relates to baseline conditions prior to the opening of the tunnel. While there may have been an element of anticipatory behaviour as awareness of the new tunnel grew over the baseline monitoring period, it will be the case that any trends observed largely reflect wider social and economic change. In particular, the earlier part of the baseline monitoring period included the recovery from the coronavirus pandemic, and this is evident in some of the trends considered.

Conventions

Full details of the social and economic monitoring work in relation to the tunnel can be found in the appropriate Silvertown Tunnel socio-economic monitoring contractor reports. The following material summarises the outputs of this work, highlights areas of particular interest and sets them in the wider context of travel and wider social and economic change in London.

For both the businesses' and residents' surveys, baseline data is usually presented in terms of the whole (that is, consolidated) baseline sample over the four survey years (three survey waves). For most variables this is appropriate, given the observed relative stability of annual samples, and maximises the available sample size. For some variables, however, changes between years over the baseline period are of more specific interest, for example in relation to awareness of the tunnel. In these cases, commentary on changes between years is also given.

7.2 Secondary data

Businesses population and composition

The broad composition of the population of **businesses by sector** across the area will inform our interpretation of trends and could also reflect, over the longer term, the evolutionary impact of the tunnel on economic activity. Business counts and employee data used for the analysis have been obtained from the Inter-Departmental Business Register (IDBR) and the Business Register and Employment Survey (BRES), respectively, classified in employment sectors as per the two-digit SIC2007 classification. They have been subsequently grouped into five sector groups, as defined in the (2013-2105) Silvertown Tunnel Business Survey:

- Primary/Manufacturing [1]
- Construction [2]
- Transport, Retail and Distribution (TRAD) [3]
- Private services (for example financial, technical, and administrative activities) [4]
- Public services (public administration and defence) [5]

Table 7.4 shows the proportion of businesses in the study and selected comparator areas that belong to each of the five sector groups, by size band (number of employees), for 2023.

Table 7.4 Number of businesses by area, number of employees (size band) and sector group, 2023.

Area	Number of employees	Sector group 1	Sector group 2	Sector group 3	Sector group 4	Sector group 5	Total
Study area	0 to 9	1.9%	11.8%	27.1%	59.2%	[none]	51,310
	10 to 49	0.9%	4.6%	38.4%	56.1%	[none]	2,720
	50 to 249	[none]	1.7%	16.7%	81.7%	[none]	300
	Over 250	[none]	[none]	[none]	94.7%	5.3%	100
	Total	2.1%	11.2%	27.3%	59.5%	<0.1%	
West London	0 to 9	1.9%	9.7%	20.7%	67.6%	[none]	131,930
	10 to 49	1.4%	3.4%	34.3%	61.0%	[none]	10,590
	50 to 249	1.5%	0.9%	32.9%	64.3%	0.3%	1,640
	Over 250	1.7%	[none]	32.2%	61.0%	5.1%	300
	Total	2.1%	9.1%	21.8%	67.0%	<0.1%	
London	0 to 9	1.9%	12.7%	22.2%	63.2%	[none]	459,220
	10 to 49	1.6%	3.8%	32.1%	62.5%	<0.1%	30,470
	50 to 249	0.8%	0.8%	21.6%	76.6%	0.1%	4,730
	Over 250	0.5%	0.5%	17.2%	79.3%	2.5%	990
	Total	2.1%	11.9%	22.6%	63.4%	<0.1%	

Source: Inter-Departmental Business Register (IDBR).

The study area has a higher proportion of businesses in the TRAD sector group (sector group 3 – 27.3 per cent) and a lower proportion within private services (sector group 4 – 59.5 per cent) than both comparator areas.

In terms of business size, the study area has a lower proportion of larger businesses (more than 50 employees), at 0.7 per cent, compared to 1.3 per cent in the West London comparator area and 1.2 per cent for Greater London. This business distribution by size band has remained largely unchanged over the baseline period.

Looking at the **businesses population by employees**, table 7.5 summarises the number of employees by sector group in the study and comparator areas. The latest available data from BRES is from 2022.

In this case we see the opposite pattern regarding TRAD and private services to what was observed in the business counts. The proportion of employees in TRAD is lower in the study area than in the comparator areas, while the proportion of those in private services is higher. This indicates that the study area has a smaller average business size in the TRAD sector and a larger average business size in the private services sector than the comparator areas. The employee distribution by sector group has also remained largely unchanged since the previous (2020) data.

Table 7.5 Number of employees by area and sector group, 2023.

Area	Metric	Sector group 1	Sector group 2	Sector group 3	Sector group 4	Sector group 5	Total
Study area	Number of employees	15,885	23,365	154,755	490,420	39,610	724,035
	Proportion over total	2.2%	3.2%	21.4%	67.7%	5.5%	100.0%
West London	Number of employees	50,220	44,565	480,210	996,115	108,155	1,679,265
	Proportion over total	3.0%	2.7%	28.6%	59.3%	6.4%	100.0%

Source: Inter-Departmental Business Register (IDBR).

Finally, in terms of **business floorspace**, according to data published by the Valuation Office Agency total business floorspace remained constant in the study area for the ten years before the pandemic (2010-2020), at around 9.8 million square metres, with a decrease after that to 9.3 million square metres in 2023. However, the individual components (retail, office, industrial and other) had different trajectories during that period. While floorspace dedicated to industrial uses saw a rapid decline (by 25 per cent) over the ten-year period to 2020, the other three uses increased between 12 per cent (office) and 17 per cent (other) to 2020. After the pandemic, 'other' uses continued to grow but have since stabilised and shown a slight decrease; office space also saw a decrease, and only retail space continued growing steadily.

This pattern of decreasing industrial space and growing retail, office and other types of floorspace since 2010 can also be seen at the London-wide level, although it was less pronounced there over the same period, with a 10 per cent decrease in industrial floorspace and a three to five per cent increase in the other three categories to 2020. After the pandemic, while industrial and 'other' continued their downward and upward trends, respectively, retail and office saw their trends reversed and reduced in total floorspace.

In the West London comparator area the situation was similar to that of Greater London, with an even larger decrease in office floorspace in relative terms.

Economic and social deprivation

The **unemployment claimant count** is a measure of the number of people claiming benefits principally for the reason of being unemployed and includes Jobseeker's Allowance and Universal Credit. The Office for National Statistics recognises that 'due to the large correlation between those claiming benefits for unemployment-related purposes and people who are unemployed, the claimant count is also often used as a proxy for unemployment. This is particularly the case for smaller domains such as local geographic areas. Since official unemployment statistics are published at a local authority level, the claimant count measure allows for a more detailed analysis of unemployment levels and comparison between smaller areas.

Using average figures for 2022, the claimant count in the study area (5.7 per cent) was higher than both the West London comparator area (4.7 per cent) and Greater London (4.9 per cent), indicating that the study area is likely to experience higher levels of unemployment than is the case for the comparator areas. Local areas with relatively higher claimant counts were located to the southwest (in Southwark), to the east north of the river (in Newham) and in Poplar and Whitechapel (in Tower Hamlets). Lower levels of claimant count were found towards the north end of the area (Wanstead) and in pockets in several areas in Eltham and Rotherhithe. In absolute numbers, the average claimant count in the study area through 2022 was over 56,000 people.

Actual unemployment figures are not provided with a spatial disaggregation lower than local authority. Table 7.6 shows the 2022 unemployment figures for the local authorities covered by the study area and the total for Greater London.

Table 7.6 Model-based estimates of unemployment, by borough, 2022 and change from 2019 to 2022.

Borough/region	Unemployment in 2022	Change in unemployment from 2019 to 2022
Barking and Dagenham	5,400	2.4%
Greenwich	7,500	2.6%
Hackney	10,200	3.9%
Lewisham	9,100	3.0%
Newham	12,300	3.4%
Redbridge	8,000	2.6%
Southwark	11,000	3.5%
Tower Hamlets	8,700	2.6%
Waltham Forest	8,600	3.1%
Greater London	224,500	2.5%

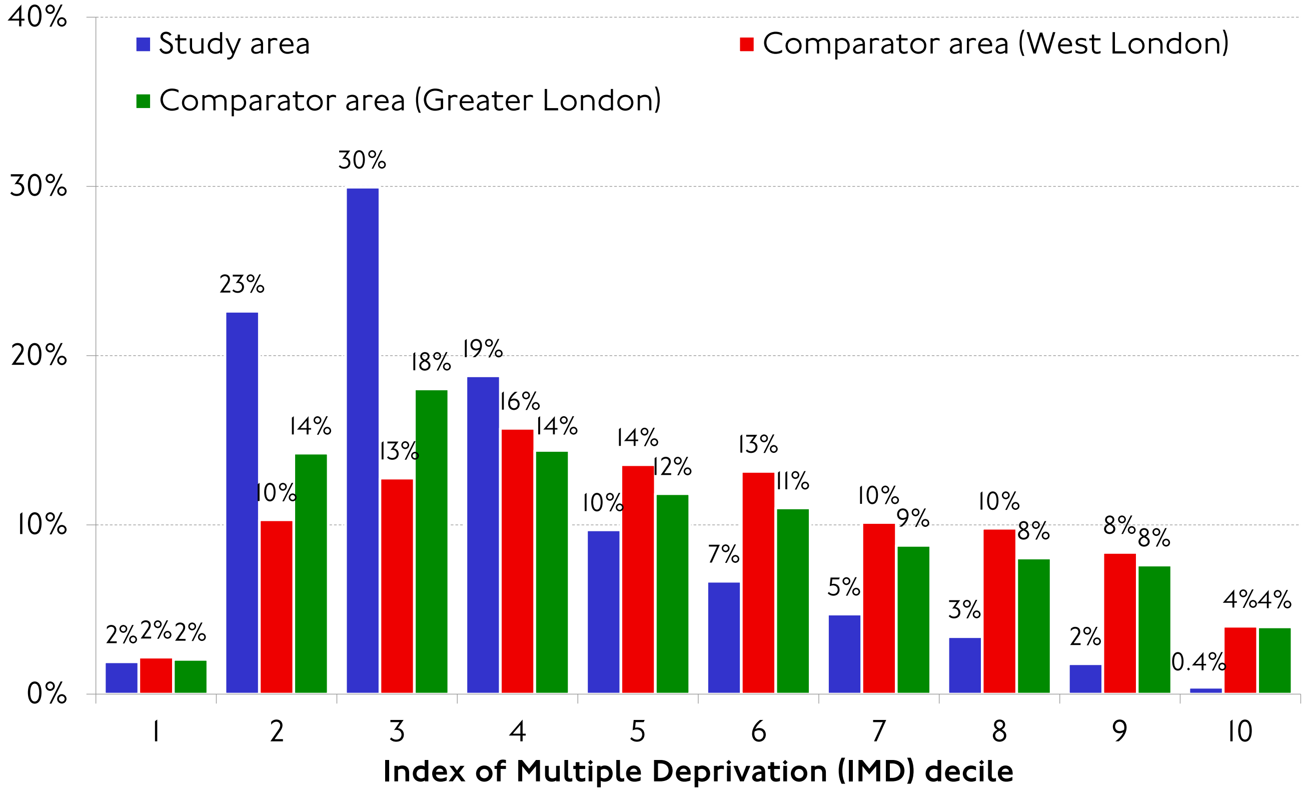
Source: Office for National Statistics (ONS).

Claimant count percentages in 2022 were higher than in 2019, which is thought to primarily reflect a pandemic-related increase in the number of people claiming unemployment-related benefits.

In terms of **deprivation**, the Index of Multiple Deprivation (IMD) is the official measure of relative deprivation in England and was last published by the Ministry of Housing, Communities and Local Government in 2019. The IMD measure is based on 39 separate indicators organised across seven domains of deprivation (for example income, health, crime), which are then weighted and combined to calculate the IMD.

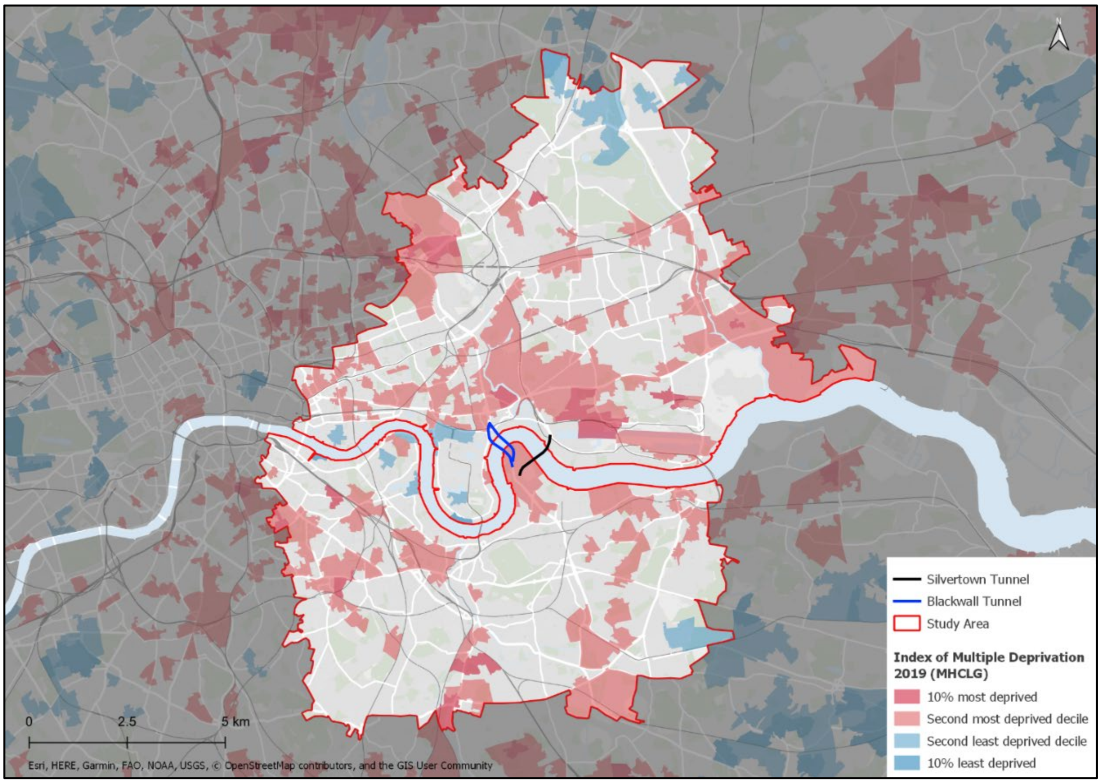
The study area had a significant proportion of population living in areas with high levels of deprivation (IMD deciles 2 to 4). Figure 7.2 shows the distribution of population in the study area, the comparator area in West London and Greater London by IMD decile. The geographical distribution of areas in the top 20 per cent most and least deprived in the study area is shown in Figure 7.3.

Figure 7.2 Population distribution across index of multiple deprivation (IMD) deciles in the study and comparator areas, 2019.



Source: Ministry of Housing, Communities and Local Government.

Figure 7.3 Most and least deprived areas (top and bottom two deciles of the index of multiple deprivation – IMD) around the Silvertown Tunnel, 2019.



Source: Ministry of Housing, Communities and Local Government.

There were highly deprived areas directly to the north and south of either end of the tunnel, especially along the north of the Thames. There were other deprived areas in Southwark, Greenwich, Hackney, and Barking.

There is some degree of correlation between areas in more deprived deciles and those with higher levels of claimant count, indicating a correlation between unemployment and overall deprivation. This is consistent with the fact that the income and employment deprivation domains (both directly related to employment status and therefore claimant count) account for 45 per cent of the IMD value.

Looking at **income**, the average equivalised household income (before housing costs) in the study area, using the latest available data from 2020, was £35,395 per year, lower than both the averages for Greater London and the West London comparator area. Table 7.4 shows these values and the upper and lower limits of the 95 per cent confidence interval as published by the ONS. This has remained largely unchanged since the previous secondary data wave (2023), which used the latest net equivalised household income data from 2020.

Table 7.7 Net equivalised household income before housing costs by area, 2020.

Area	Net equivalised household income	Upper confidence limit	Lower confidence limit
Study area	£35,395	£39,759	£31,500
West London	£41,528	£46,795	£36,860
Greater London	£38,103	£42,781	£33,939

Source: Office for National Statistics (ONS).

In terms of the spatial distribution of income levels within the study area, there were large differences between lower income areas to the east (East Ham, Barking), with averages below £30,000 per year and higher income areas in Wanstead, Greenwich (Blackheath), the Isle of Dogs, Rotherhithe and Wapping, with average incomes over £45,000 per year (figure 7.4).

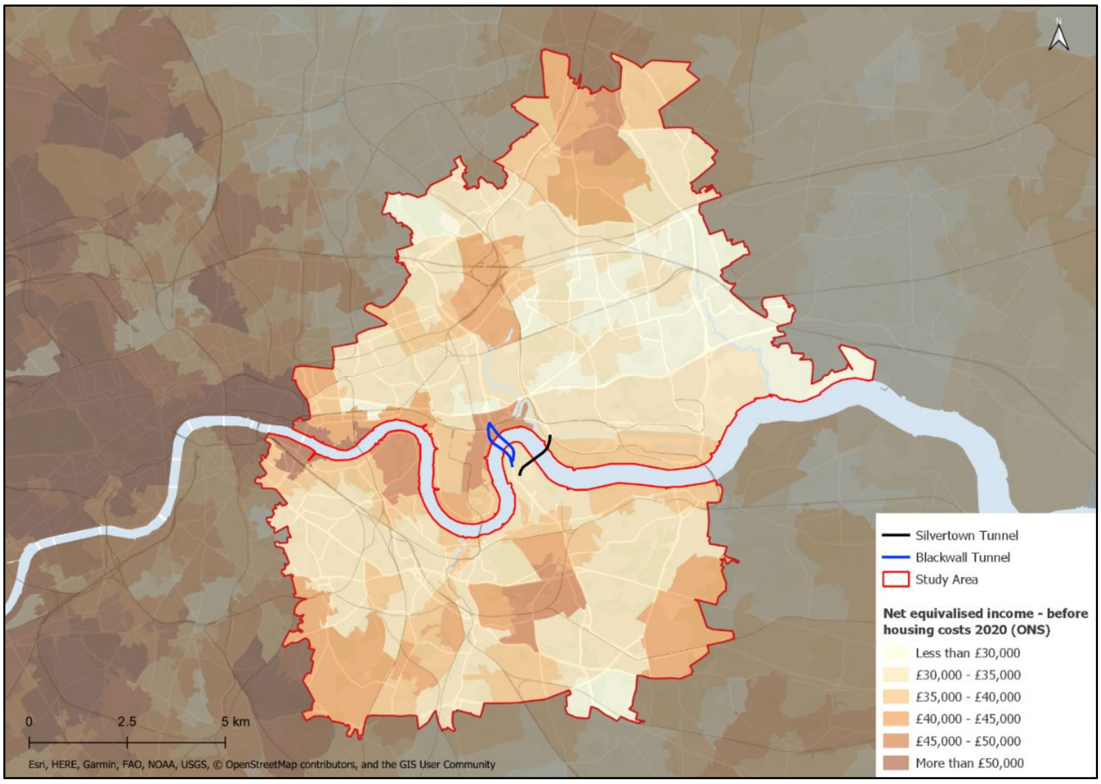
Housing

Housing affordability is the ratio of the average housing sale price and the net equivalised household income. Therefore, higher ratios mean lower affordability and lower ratios mean higher affordability. Figure 7.5 shows housing affordability in the study area using data from 2020. Also highlighted are the main opportunity areas for development, which could improve housing affordability in the area.

The average affordability ratio in the study area was 11.84, with the most affordable areas to the east (East Ham) and the least affordable to the north (around Wanstead Flats and Wanstead Park).

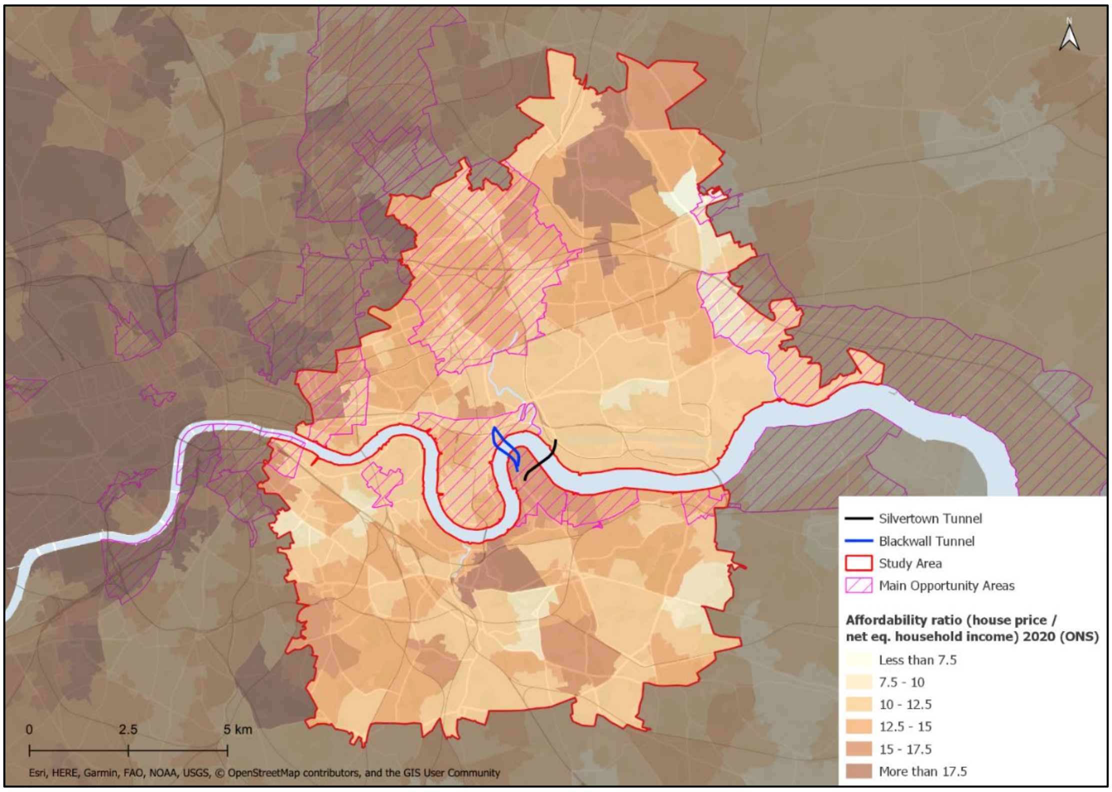
Overall, the study area was more affordable in terms of housing than both the West London comparator area (with an affordability ratio of 15.29) and Greater London (with a ratio of 12.25). Given that incomes were lower in the study area than in both the comparator areas, this means that homes were still relatively less expensive compared to other areas even once lower incomes are considered. The picture of housing affordability in the study area and the comparator areas stayed broadly similar to the 2020 secondary data analysis, which used 2018 data.

Figure 7.4 Spatial distribution of net equivalised household incomes before housing costs around the Silvertown Tunnel, 2020.



Source: Office for National Statistics (ONS).

Figure 7.5 Spatial distribution of housing affordability around the Silvertown Tunnel, 2020.



Source: Office for National Statistics (ONS).

In terms of **housing developments**, there is expected to be significant housing growth in the study area during the coming years, as evidenced by live planning applications for residential developments. Data for the analysis has been obtained from the latest version of the Planning London Datahub (PLD) (September 2024) and includes planning applications that are labelled as commenced or approved with a lapse date later than September 2024.

Considering the planning applications with the above criteria, the study area would see a net addition of 67,000 residential units, compared with 61,000 in the West London comparator area and 200,000 in Greater London. This gives an indication of the relatively larger pipeline of residential developments in the area around the tunnel.

In the pre-pandemic period of 2015-2020, the study area had a net addition of 52,000 residential units, compared to 48,000 in the West London comparator area and 209,000 in Greater London. These figures correspond to completed planning applications in the PLD with completion construction date within the mentioned period. The figures during the most recent six-year period (2018-2023), which includes pandemic years, were much lower, with 36,000 net new residential units in the study area, 36,500 in the West London comparator area and 145,000 in Greater London.

Population

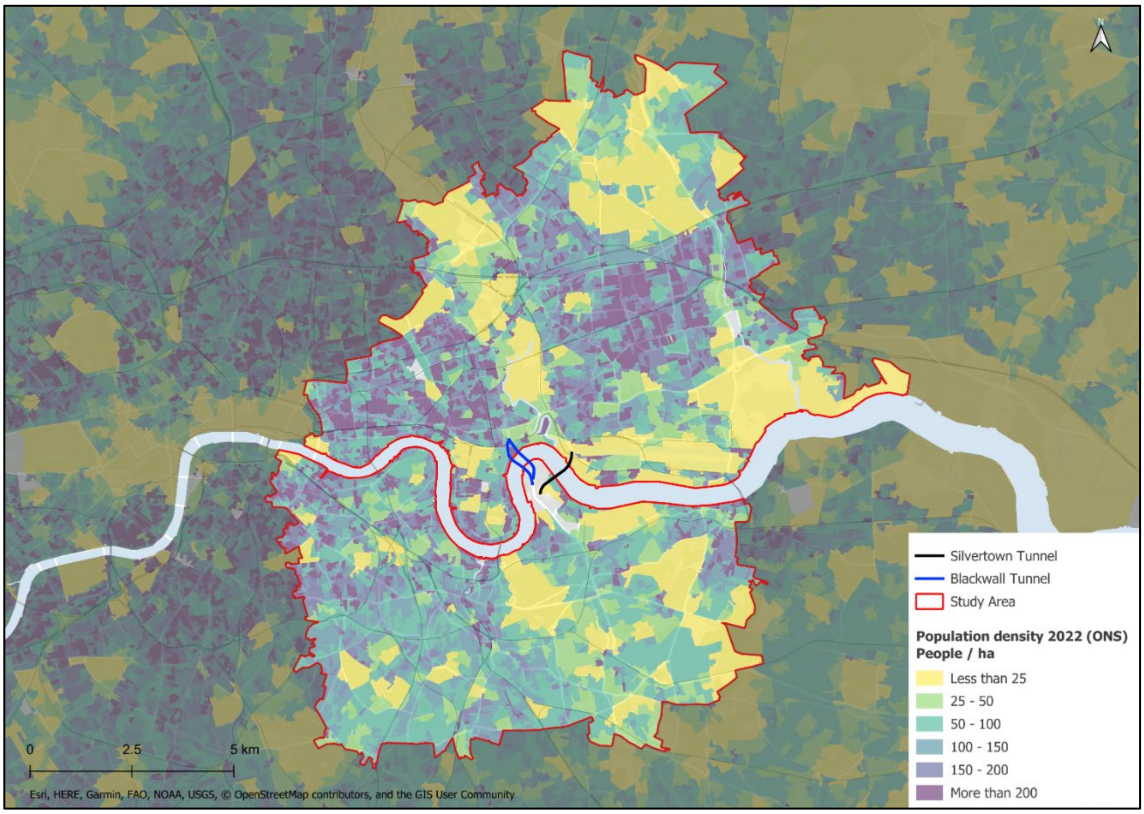
The **resident population** in the study area was 1.4 million people in 2022, according to the mid-year population estimates from the ONS. Population density was higher (over 200 people per hectare) in most areas of Tower Hamlets, central Newham and some pockets in the north of Southwark and around Woolwich. Other areas in Southwark, Lewisham and Greenwich had densities mostly around 50-100 people per hectare and there was a clear contrast with sparsely populated areas, which included the Lea Valley, North Greenwich and other areas with parks (Wanstead, Greenwich – Blackheath) or large industrial or employment sites (such as Beckton), as shown in figure 7.6.

Looking at **population change**, while population in the comparator areas was larger in 2022 (1.8 million in the West London comparator area and 8.8m in Greater London), population growth over the 2017-2022 five-year period and the 2012-2022 ten-year period was greater within the study area, with cumulative values of 4.6 per cent and 13.4 per cent, respectively. Both comparator areas showed population growth of less than one per cent in the 2017-2022 period and less than five per cent in the 2012-2022 period.

Figure 7.7 shows the distribution of the 10-year population growth by LSOA, where blue shades show a decrease in population and darker shades of orange show a higher population increase (over 20 per cent).

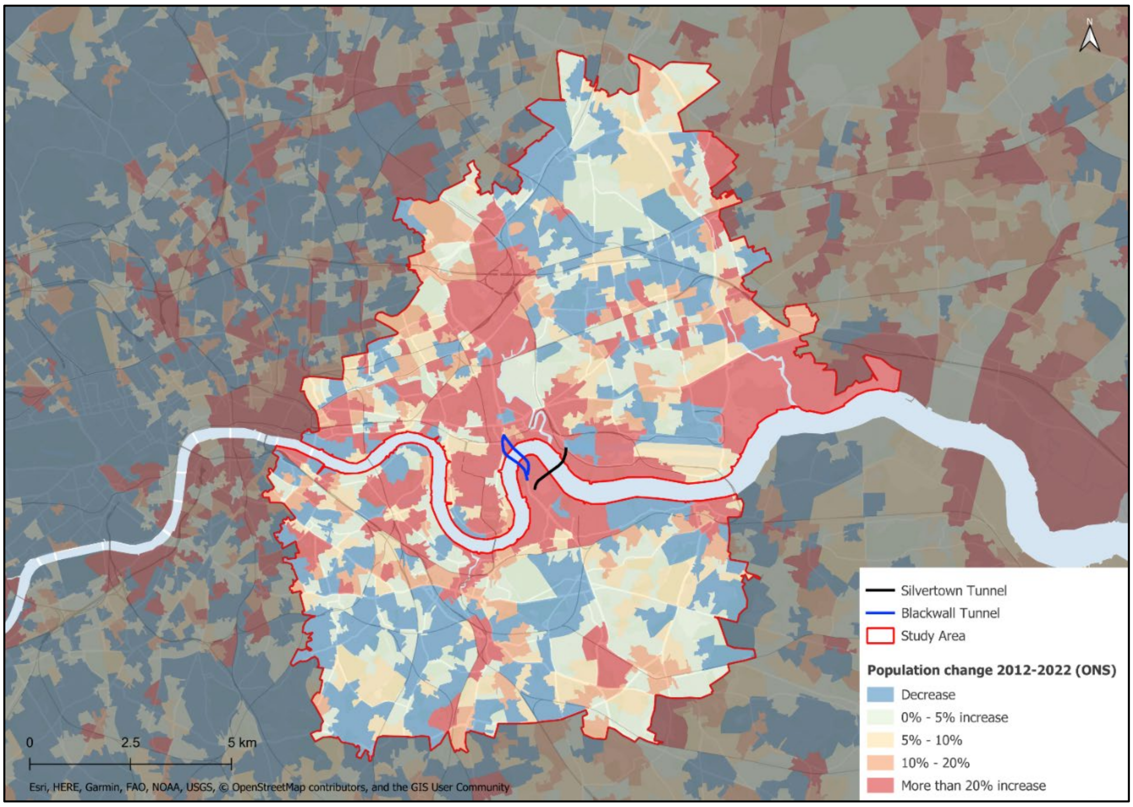
There was an increase in population in most parts of the study area over the decade between 2012 and 2022. Except for some areas in the north of Southwark and Tower Hamlets, the largest population increases were associated with new developments in brownfield areas with lower population densities such as Stratford – Olympic Park, North Greenwich, Canning Town, Silvertown and Beckton.

Figure 7.6 Population density around the Silvertown Tunnel, 2022.



Source: Office for National Statistics (ONS).

Figure 7.7 Spatial distribution of population change between 2012 and 2022 around the Silvertown Tunnel.



Source: Office for National Statistics (ONS).

In terms of the **population age structure**, the study area had a similar proportion of population aged under 18 to the Greater London and the West London comparator area (21.4 per cent in the study area compared to 19.7 per cent in West London and 21.4 per cent in Greater London). However, there was a clear difference in terms of older populations, with the proportion of those aged 65 or more being 8.0 per cent in the study area compared to 12.2 per cent and 12.1 per cent for the West London and Greater London comparator areas, respectively. Therefore, the study area had on average a younger population, with the median age being younger than that of the West London comparator area and Greater London. There was also a clear difference in age profiles at the mid-40s, with the study area having 68 per cent of people aged 43 (the median) and under, compared to 60 per cent in the West London comparator area and 61 per cent in Greater London.

Looking at **ethnicity** in the study area, as a contextual indicator, in the 2021 census the largest group was formed of residents identifying themselves as White (43 per cent), followed by Asian (29 per cent) and Black (18 per cent). Population identifying as any of the non-White groups combined were a majority in the study area (57 per cent of the total population). Spatially, there were significant contrasts between areas where White ethnic groups were the majority (for example Greenwich, Eltham, Wanstead, Bethnal Green, Peckham) and areas where non-White groups were more than 70 per cent of the population (for example East Ham – Manor Park, Burgess Park, Deptford and areas in Tower Hamlets between Bromley-by-Bow and Whitechapel).

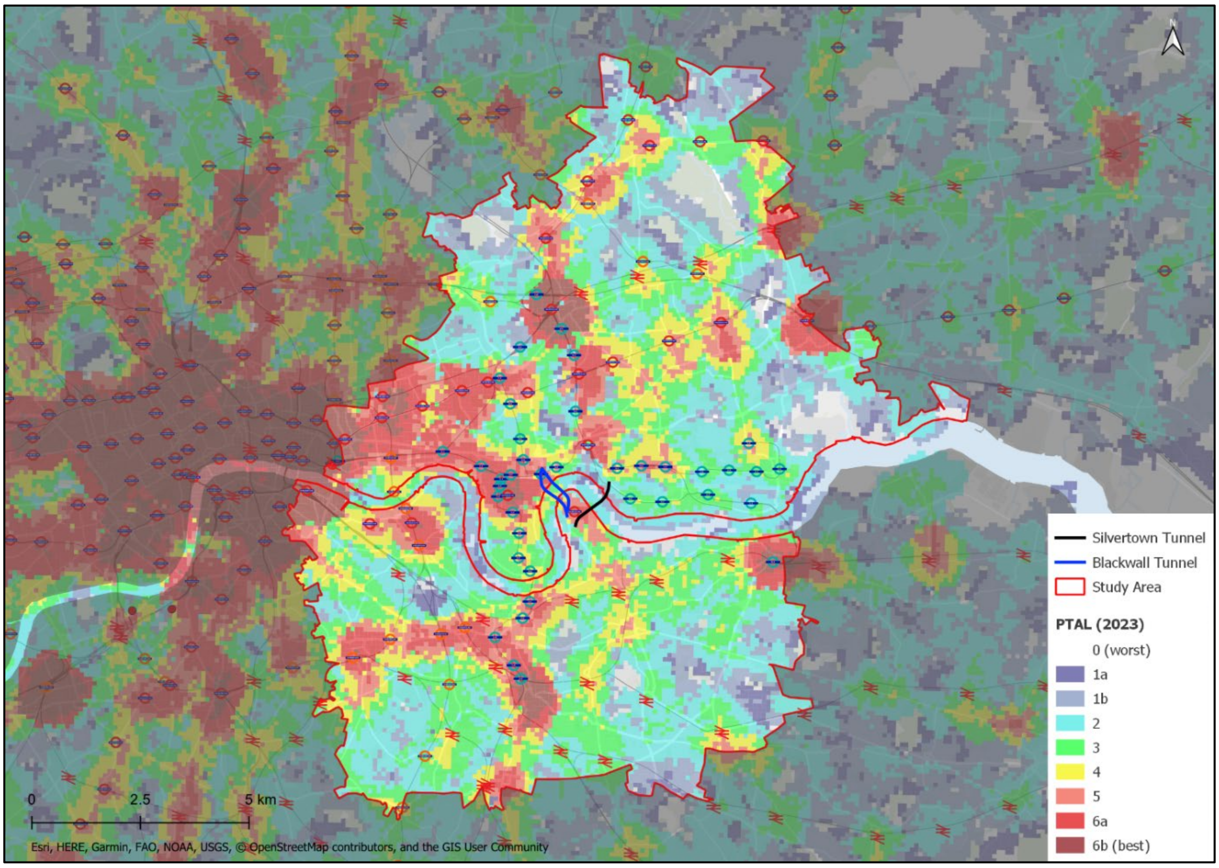
This was different from both the West London and Greater London comparator areas, which both have a majority of White population (54 per cent) and therefore smaller proportions of non-White groups (46 per cent). This data was published by the ONS at area levels smaller than local authority only as part of the national census, and therefore it is expected to be updated only every ten years.

Transport and travel

The **Public Transport Access Level (PTAL)** measures the accessibility to the public transport network of a certain point or area. This considers both walking access time to public transport stops and stations and the number and frequency of public transport services serving those stops. The PTAL does not measure the connectivity to jobs or people that these public transport services might provide or other characteristics such as service reliability, crowding or speed. There are eight PTAL categories from 1a or 'low' (representing very poor accessibility) to 6b or 'high' (representing excellent accessibility to public transport).

Figure 7.8 shows these levels across the study area for 2023. Areas with the highest levels were those near rail or London Underground stations. A combination of different rail services with bus routes, for example around transport interchanges like Stratford, Lewisham or Canada Water, created larger areas in the highest two PTAL categories (6a and 6b). On the other hand, areas with no frequent and reliable public transport nearby were mostly concentrated to the north, east and southeast of the study area.

Figure 7.8 Spatial distribution of Public Transport Access Levels (PTALs) around the Silvertown Tunnel, 2023.



Source: Transport for London.

The PTAL measures access to public transport hubs and is therefore relatively insensitive to changes in service levels. New bus services through the tunnel would therefore be expected to improve PTAL locally like, historically, has the development of the Elizabeth line corridor to and from Abbey Wood. In contrast, the Elizabeth line offering at Stratford and Woolwich had relatively little local impact because such locations were already well connected to the public transport network.

Various sources describing **travel patterns** within the study area are available. The 2021 census provides information on travel to work (commuting). This is described in the Silvertown Tunnel socio-economic monitoring contractor reports and provides a contextual indicator. However, this will not be updated until 2031 and so is not useful for tracking short-term change.

More comprehensive information is available from TfL's London Travel Demand Survey (LTDS), which is a comprehensive travel diary-based survey of London residents only with an annual target sample size of around 8,000 complete households, designed to be broadly representative of London's population. The wide range of travel indicators that are potentially available from this survey are demonstrated by previous Travel in London reports. Although the LTDS has a continuous data series from 2006/07 and collects a comprehensive range of sociodemographic data, on which basis the travel data can be disaggregated, it is limited by the available sample size for small-area studies such as within the study area.

Further data is available from TfL's, for example describing public transport patronage on the main rail lines and bus routes in the study area. These sources will be adapted to cover the new bus services introduced with the tunnel's opening and key changes in the local public transport patronage will be described in subsequent reports. Comprehensive data is also available in relation to traffic and the local road network, as described in section 4 above.

Trip rates (the average number of trips made per person per day) are a basic indicator of travel and can be expressed in various ways (for example by mode or journey purpose). In terms of total trips made by residents, the daily average (for a seven-day week) in 2023/24 was 1.977 trips in Greater London and slightly lower (1.953) in the study area, as shown in table 7.8.

Table 7.8 Trips per person per day (seven-day week average) by mode and mode share by London residents, LTDS, 2023/24.

Mode of transport	Trip rate (study area)	Trip rate (Greater London)	Mode share (study area)	Mode share (Greater London)
Walking and cycling	0.784	0.791	40.1%	40.0%
Private transport	0.527	0.649	27.0%	32.8%
Public transport	0.642	0.537	32.9%	27.1%
Total	1.953	1.977	100%	100%

Source: TfL Strategic Analysis, Customer & Strategy.

The Mayor's Transport Strategy has a target for 80 per cent of all journeys to be made by walking, cycling or public transport by 2041. The LTDS data analysed here (which is for London residents only) showed this proportion to be at 73 per cent in the study area compared to 67 per cent across Greater London.

Access to a car or van in the household is another important indicator when analysing travel behaviour and patterns, as it impacts the mode share of residents in a given area. Typically, the average number of cars available per household is lower in urban than in rural areas due to higher densities, a better public transport offer and shorter trip distances. In urban areas, it is the case that many households do not have a car available at all, since they rely on alternative travel modes.

Table 7.9 shows the distribution of households in the study area and in Greater London classified by their access to a car or van. In 2023/24, 45.4 per cent of households did not have access to a car or van in Greater London, compared to 56.4 per cent in the study area.

Table 7.9 Proportion of households with access to a car or van, LTDS, 2023/24.

Number of cars or vans available	Study area	Greater London
None	56.4%	45.4%
One	37.1%	41.5%
Two or more	6.6%	13.0%

Source: TfL Strategic Analysis, Customer & Strategy.

In terms of **trip lengths**, the situation in 2023/24 was similar in the study area and in Greater London, as shown in table 7.10. Over half of all trips were shorter than two kilometres, with 70 to 75 per cent under five kilometres. Only three per cent of all trips (five per cent in Greater London) were longer than 20km.

Table 7.10 Trip length distribution of trips made over a seven-day week, LTDS, 2023/24.

Trip length	Study area	Greater London
Less than two kilometres	53.7%	51.8%
Two to five kilometres	21.3%	20.9%
Five to 10 kilometres	14.9%	14.4%
10 to 20 kilometres	6.6%	8.7%
20 to 50 kilometres	2.3%	2.9%
More than 50 kilometres	1.2%	1.3%

Source: TfL Strategic Analysis, Customer & Strategy.

Trip purpose is another relevant metric to understand the transport context and the travel behaviour of residents in the study area. The several detailed purposes included in the LTDS have been aggregated into six broader categories: usual workplace, other work, leisure, shopping or personal business, education and other.

Table 7.11 shows the purpose split of weekly trips made by residents in the study area and Greater London in 2023/24.

Table 7.11 Trip purpose distribution, LTDS, 2023/24.

Trip purpose	Study area	Greater London
Usual workplace	15.1%	15.2%
Other work-related	5.4%	5.7%
Leisure	30.0%	31.1%
Shopping or personal business	21.3%	21.2%
Education	11.0%	9.7%
Other	17.3%	17.1%

Source: TfL Strategic Analysis, Customer & Strategy.

The purpose split was broadly similar, with commuting trips (to and from usual workplace) around 15 per cent and leisure and shopping or personal business trips (combined) accounting for more than 50 per cent of all trips.

7.3 Businesses surveys

Sample composition and characteristics

Table 7.12 summarises the overall achieved sample for the businesses' surveys across all three pre-opening waves. Note that due to rounding some totals may not exactly equal 100 per cent.

Table 7.12 Pre-opening businesses' surveys weighted sample and proportion by sector, 2021, 2023 and 2024 waves combined.

Business sector	Weighted responses	Sample proportion
Primary/manufacturing	42	3%
Construction	118	10%
Transport, retail, distribution	209	17%
Public sector services	25	2%
Private sector services: Information and communication	184	15%
Private sector services: Financial and insurance and Professional, scientific, and technical	279	23%
Private sector services: Administrative and support	124	10%
Private sector services: Other	222	18%

Source: Steer, on behalf of Transport for London.

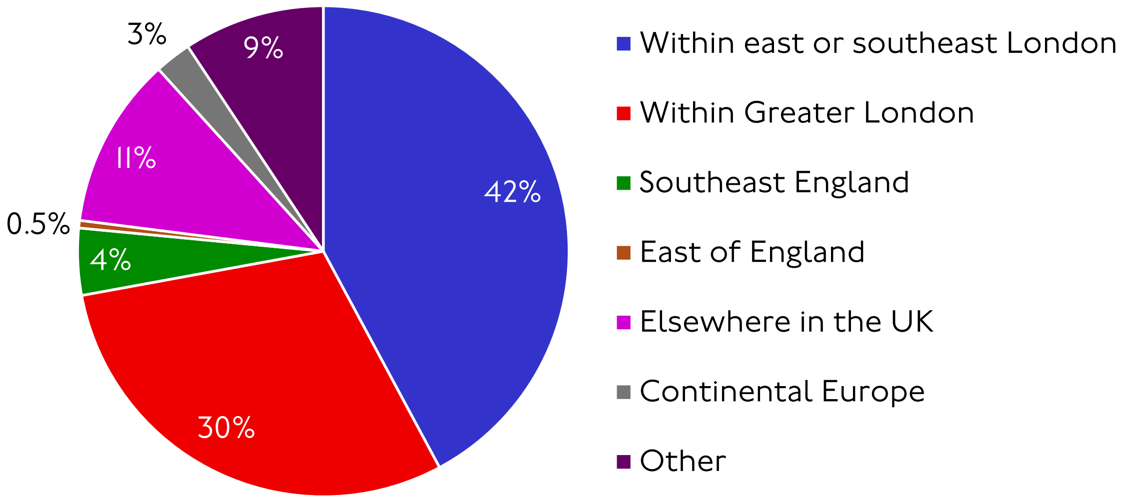
In terms of businesses' size, most were micro businesses with less than 10 employees, followed by small businesses with up to 50 employees and a much lower proportion of medium and large businesses with over 50 employees. Some 90 per cent of businesses responding to the survey had fewer than 10 employees across all sites. Businesses with more than one site were asked to consider a specific site within the study area.

Businesses' operations and travel

In considering businesses' operations in terms of customers' travel, business trips and deliveries, the baseline position inevitably reflects the limited river crossing options available at the time, particularly for road traffic. To the extent that the new tunnel improves this, related indicators might be expected to show a corresponding change over time.

In terms of **customer locations**, the overall pattern shown by figure 7.9 is as might be expected, although there were some notable differences by sector. Construction businesses had a larger share of their customer base located in east or southeast London and Greater London, with a total of 89 per cent. In contrast, businesses that had a greater client base outside of London were services in the private sector (41 per cent) as well as primary/manufacturing (38 per cent). However, the term customer does not directly reflect visits to the business and 37 per cent of businesses did not receive any customer visits at all. Of the remainder, 20 per cent received one to 10 visitors per week, 19 per cent had 11-99 visitors per week and 17 per cent reported seeing 100 or more visitors per week.

Figure 7.9 Distribution of customer locations, 2021, 2023 and 2024 combined.



Source: Steer, on behalf of Transport for London.

Within this overall profile, the surveys provided information on the **modes of travel used by customers** who travelled to the site, this question only being relevant to businesses who reported receiving any customers.

Businesses to the north of the river were more likely to have visitors coming by car or van, while those to the south were more likely to have visitors come by bus. Those on the south side were also more likely to see customers cycling or visiting their premises by public transport or taxi. Walking had an equal share of responses across both locations.

In terms of key changes to this measure over the baseline period, a reduction in the proportion of customers arriving by car or van or by TfL rail was noted, as was a relative increase in customers walking to the site.

In terms of **business travel**, the proportion of sampled businesses who made business trips remained constant throughout the baseline period, at 63 per cent. Among those who made business journeys, 44 per cent reported between one and 10 trips per week and 15 per cent between 11 and 99 trips per week. Only nine businesses (less than one per cent of the sample) stated making 100 or more trips per week. Among those who made business trips, car remained the most common choice of transport (35 per cent) although this was decreasing over the baseline period.

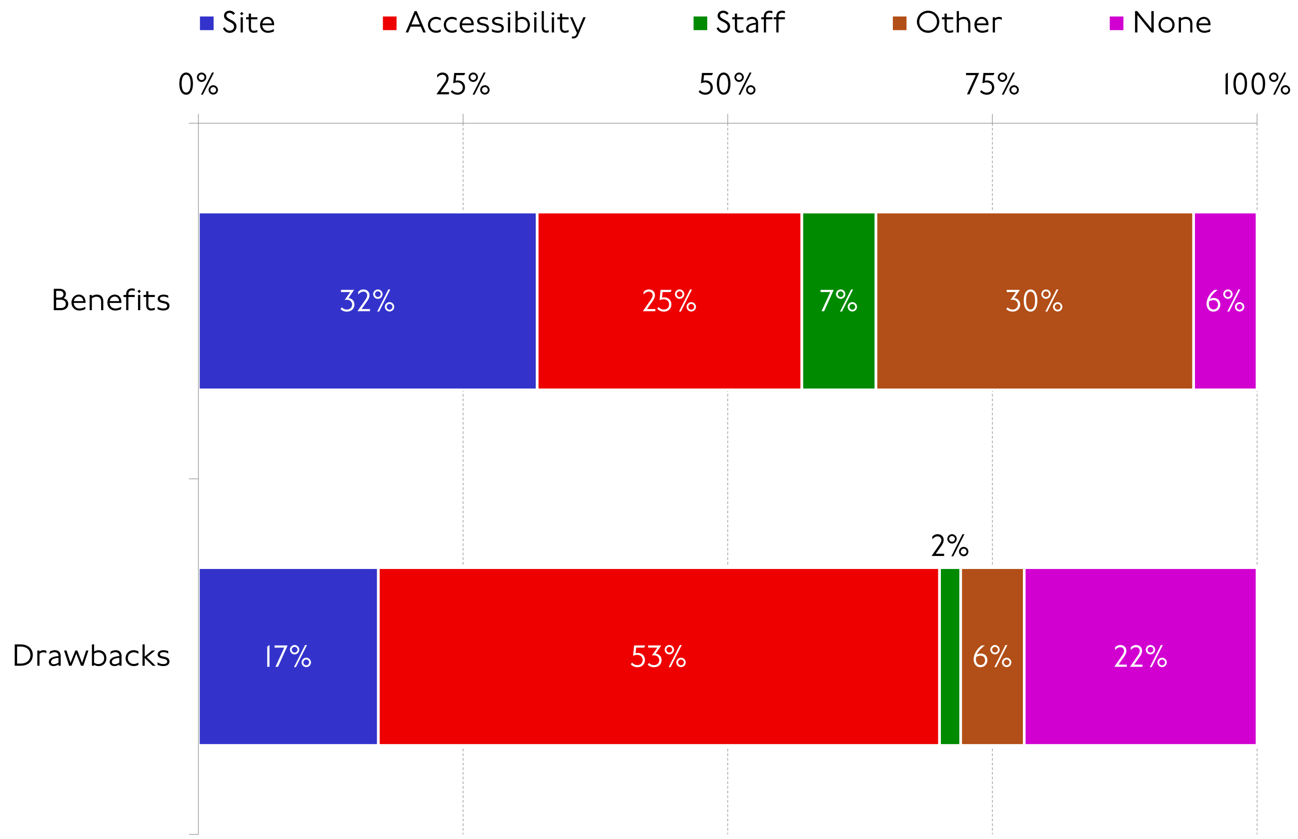
As might be expected, **supplier locations** ranged far and wide, with only 17 per cent of the identified main suppliers being located within east or southeast London and a further 20 per cent within the rest of Greater London.

In terms of incoming **deliveries**, most businesses (72 per cent) received at least one delivery per week, with one to 10 deliveries per week being the most commonly estimated volume (56 per cent). Only one per cent had more than 100 deliveries per week.

Most businesses had no deliveries leaving their site each week (65 per cent). Some 22 per cent made between one and 10 deliveries, while only seven per cent reported making 100 or more deliveries per week. The highest delivery volume mentioned was 1,500 per week. The general distribution of deliveries into and out of the businesses' premises was consistent between waves.

Locational decisions made by businesses partly reflect their own evaluation of the benefits and drawbacks of the location in relation to the activities of the business and other potential locations, but also reflect other factors such as inertia (for example, if they have been there a long time). Although the new tunnel is partly predicated on improving transport links to benefit businesses, the pre-opening assessment of established businesses suggests, as would expected, that the location already offers facilities and opportunities that are commensurate with their historic choice of location, alongside areas which could be improved. It is therefore of interest to understand these in the baseline situation, so that, after the opening, potential changes can be identified. Figure 7.10 shows these, in terms of net scores for the most commonly identified benefits and drawbacks for the entire baseline sample.

Figure 7.10 Distribution of the main benefits and drawbacks stated by businesses about their location, 2021, 2023 and 2024 combined.



Source: Steer, on behalf of Transport for London.

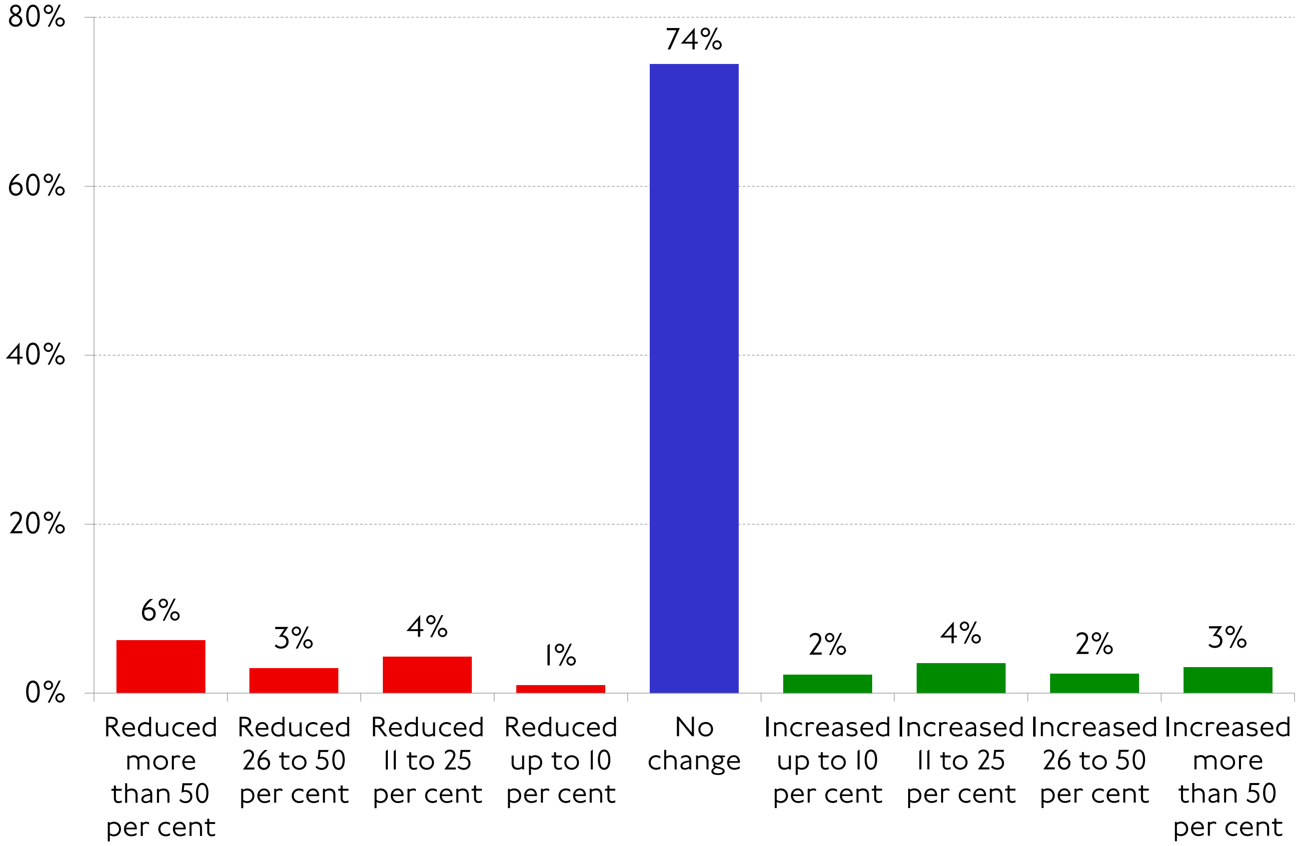
Within the broad category of benefits, proximity to customers was the most commonly reported answer, with proximity to other businesses being less frequently mentioned. In terms of accessibility, easy access by rail (13 per cent) and road (11 per cent) were the most commonly reported benefits. Among the staff-related benefits, 'accessibility to staff' was mentioned by six per cent of businesses.

Looking at the drawbacks, the general distribution of answers was similar throughout the baseline waves, showing that the main drawback was accessibility (53 per cent), followed by no drawbacks (22 per cent) and site features (17 per cent). Under the accessibility category, congestion was the highest drawback scorer (25 per cent), followed by difficulty of access by road (15 per cent) and access by rail (7 per cent). Insufficient parking was stated as another major drawback (16 per cent). In general, there was a similar distribution of responses across businesses to the north and south of the river, but businesses located to the south of the river were more likely to state difficulty of access by road as a disadvantage (26 per cent, compared to 12 per cent in the north).

Businesses' performance and outlook

Looking first at **employment and recruitment**, figure 7.11 shows the distribution of responding businesses in terms of change in the number of employees on site in the survey year (for all three baseline waves combined).

Figure 7.11 Distribution of businesses by change in the number of people working on site in the survey year, 2021, 2023 and 2024 combined.



Source: Steer, on behalf of Transport for London.

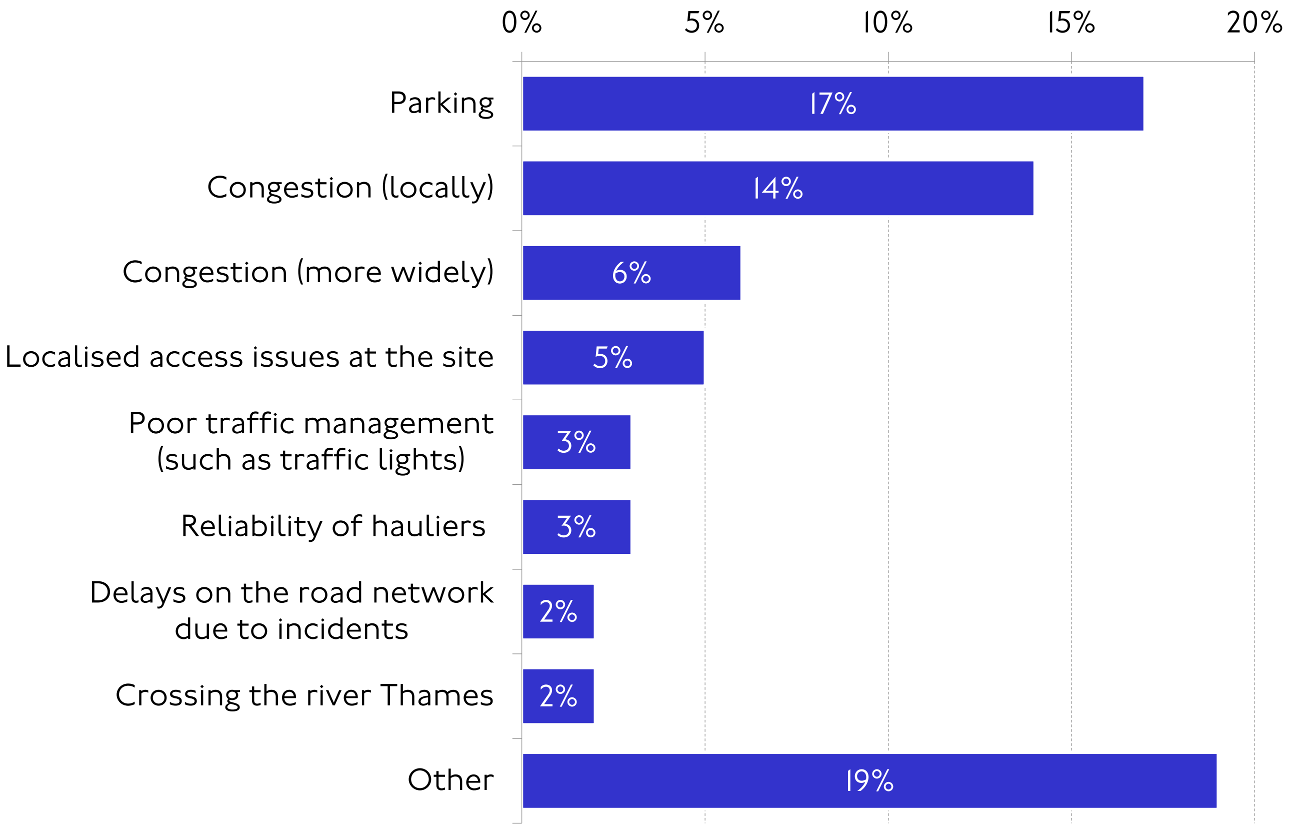
Most businesses (74 per cent) stated no change in the number of employees in the survey year but there was a small skew towards reduced staff numbers, perhaps reflecting the aftermath of the pandemic.

To set against this, information on businesses' recruitment suggests that substantially more businesses (32 per cent) were planning to recruit in the 2024 survey wave, compared to the 2021 wave (24 per cent). Businesses were also more likely to report that it was easy (41 per cent) rather than difficult (27 per cent) to recruit for positions over the three survey waves. Considering the main difficulties businesses face in recruiting staff, 45 per cent cited 'type of work' and 'right skills' as constraints. In terms of locational and transport issues (separately categorised), 'location of business', 'difficult to get staff to travel to this side of the river' and 'poor road links' were mentioned by seven, six and five per cent of businesses, respectively.

When asked about **relocation**, most surveyed businesses (85 per cent) did not expect to move from their site in the next year, 10 per cent of businesses expected to move and five per cent stated that they did not know. This was consistent throughout all waves.

Looking at **issues with deliveries**, some 56 per cent of businesses reported no issues with deliveries to their site. Those who had experienced problems mentioned parking (17 per cent) and local congestion (14 per cent) most often (figure 7.12). In general, smaller shares of businesses in 2024 stated parking and congestion locally as the main issue with deliveries, compared to 2021. Businesses to the south of the river were significantly more likely than those in the north to cite congestion locally and more widely as well as localised access issues to the site.

Figure 7.12 Common problems with deliveries to the site reported by businesses, 2021, 2023 and 2024 combined.



Source: Steer, on behalf of Transport for London.

Ease of access by customers/clients was deemed to be more important to businesses than access to markets for goods-out or business travel, with 58 per cent of businesses saying that ease of access by customers/clients was very important compared to 48 per cent for access to markets. Comparing findings from previous waves, a larger proportion of businesses said that easy access by customers had become less important, with net important answers (combining 'very important' and 'slightly important') reducing in 2024 compared to 2021 (70 per cent compared to 73 per cent, respectively).

There were no significant variations by location, with businesses in the south and north equally saying that ease of access to customers and markets was very important. However, TRAD businesses were more likely than others to state that ease of access to customers/clients and markets was very important (74 per cent compared to an average of 58 per cent for customers/clients and 54 per cent compared to an average of 44 per cent for markets). Perhaps as expected, construction businesses were the least likely to regard ease of access to customers to be very important, with 39 per cent of businesses stating it was very important compared to an average of 58 per cent.

Cross-river travel

This section reports findings from the businesses' surveys in relation to their pre-opening use of river crossings, including the importance of the available crossings. It considers how river crossings may have been constraining activity and the predictability of road traffic. It concludes with a look at businesses' attitudes towards the new Silvertown Tunnel.

There are significant methodological limitations associated with these findings, especially the difficulties that survey respondents had in accurately quantifying the details of customer/visitor travel. Nevertheless, as a consolidated baseline, it provides a consistent set of indicators that can be used to assess change after the opening,

When asked about the **use of river crossings by customers**, a third of businesses (33 per cent) said that their visitors/customers did not cross the river in east/southeast London by car, van, or bus to get to their site. A further 26 per cent did not know whether their customers were crossing the river to reach their site. This was consistent across waves.

Among the 40 per cent who said that some of their customers crossed the river, the most given answer was that one to 20 per cent of customers crossed the river. Very few businesses said that the majority of their visitors crossed the river.

There were some differences by business location. Among businesses to the south of the river, a larger share (35 per cent) said that their customers did not need to cross the river, compared to 30 per cent among businesses in the north.

Construction businesses were the least likely to have visitors crossing the river (25 per cent) compared to those in the TRAD (45 per cent) and private sectors (48 per cent).

In terms of the **use of river crossings for business trips**, about half (52 per cent) of businesses said that at least some of their business trips crossed the Thames in east/southeast London. Only 16 per cent said that more than 60 per cent of business trips crossed the river.

Compared to previous waves, fewer businesses said that they did not cross the river for business trips in 2024 (39 per cent) than in 2021 (44 per cent).

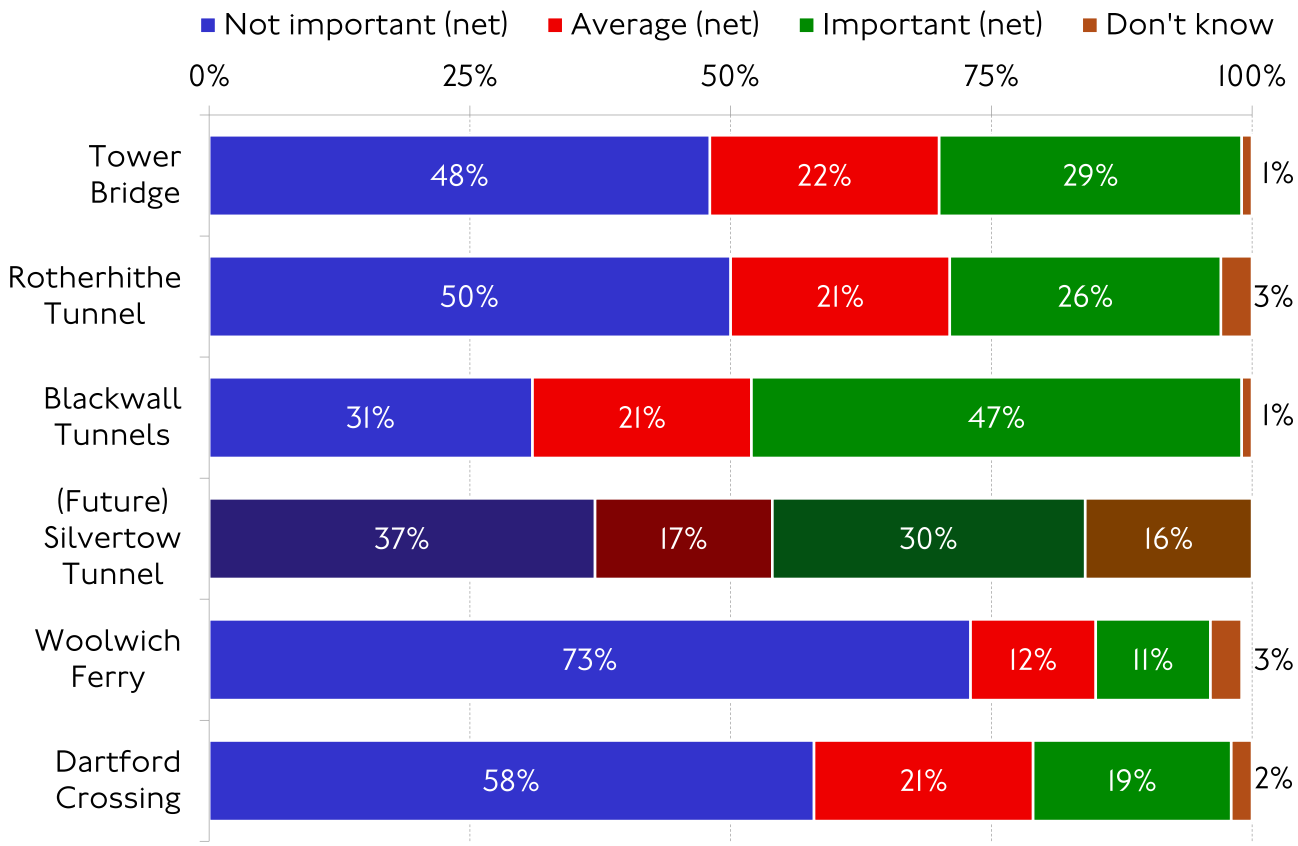
The frequency of business trips crossing the river provided one of the largest differences between businesses located to the north and south of the river. More than two in five (46 per cent) of businesses to the north made business trips which crossed the river, while for businesses to the south this was more than three in five (60 per cent).

In addition, businesses to the south said that much larger volumes of business trips needed to cross the river: nearly half (45 per cent) said that at least 41 per cent of trips crossed the river, compared to 17 per cent of businesses in the north saying this. This trend was consistent across all waves.

Construction businesses (73 per cent) were more likely to say that they crossed the river for business trips, compared to TRAD (36 per cent) and private sector (40 per cent) businesses.

Looking at the **importance of river crossings** in the pre-opening context and in terms of net scores, figure 7.13 shows the relative businesses' rating of the importance of river crossings. Note that due to rounding some totals may not exactly equal 100 per cent.

Figure 7.13 Relative importance of river crossings for businesses, 2023.



Source: Steer, on behalf of Transport for London.

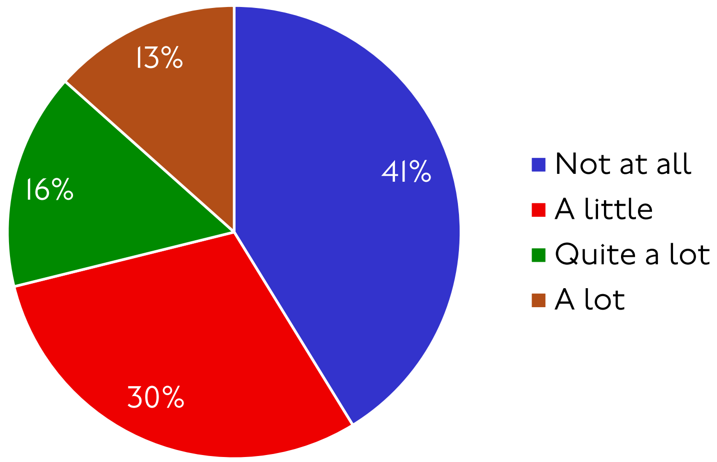
The position of the new Silvertown Tunnel is probably commensurate with the early businesses' awareness and planning. Changes in this indicator following the opening of the tunnel will be of particular interest.

Looking at **river crossings constraining activity**, two in five businesses (40 per cent) said that the number or capacity of river crossings did not constrain operations or the viability of the business at their current site (figure 7.14). This might be expected, given that businesses located in these areas with the existing cross-river connectivity and will have adapted their operations, either consciously or unconsciously, to a context in which the Silvertown Tunnel did not yet exist or provide transport/connectivity options.

In terms of change over the baseline period, the proportion of businesses who said that they were constrained in some way increased from 52 per cent in the first wave (2021) to 59 per cent in the latest wave in 2024, perhaps reflecting an increasing awareness of the new tunnel.

Finally, in terms of the predictability of road traffic, 51 per cent of businesses felt that the predictability of journey times for road traffic crossing the Thames in the Silvertown/Blackwall area was poor or very poor, while 13 per cent said that predictability of journey times was good or very good. Predictability reduced in each wave, with the proportion of respondents rating it poor being 46 per cent in 2021, 50 per cent in 2023 and 55 per cent in 2024, showing a clear decline in the perception of predictability.

Figure 7.14 Extent to which the current number or capacity of river crossings constrain the operations or viability of businesses, 2021, 2023 and 2024 combined.



Source: Steer, on behalf of Transport for London.

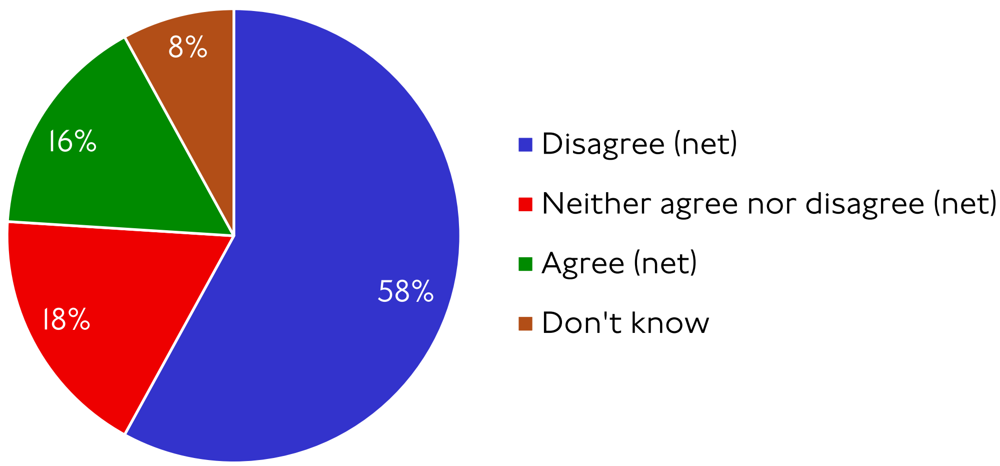
Tunnel awareness and businesses' preparedness for the opening

Businesses' awareness of the tunnel was only measured in the 2023 and 2024 survey waves and showed an increase in the most recent wave to around three-quarters of the respondents. Of those who said that they were aware of the Silvertown Tunnel, the majority (56 per cent) stated knowing a little about it, followed by those knowing a lot about the tunnel (25 per cent) and around one in five (19 per cent) only knew the name.

In terms of perception of suitable river crossings, the majority of businesses thought that the current crossings were inadequate and only two out of five agreed that they were adequate. These findings were used to influence TfL's approach to raising stakeholder awareness of the new tunnel in the pre-opening period.

Most businesses (58 per cent) stated that they did not have plans in place for the opening of the tunnel and only 16 per cent said that they had plans in place (figure 7.15). This question was only included in the 2024 wave so there are no data from previous waves.

Figure 7.15 Proportion of businesses that have plans in place to take advantage of the new connectivity offered by the Silvertown Tunnel, 2024.



Source: Steer, on behalf of Transport for London.

Summary of baseline conditions

Businesses in the area reported both opportunities and challenges related to their locations. Proximity to central London and key transport links supports access to customers and skilled labour and 59 per cent of businesses in the private services sector benefit from local connectivity. However, 52 per cent of businesses identified constraints caused by inadequate river crossings, including delivery delays and challenges in accessing suppliers and markets. At baseline, 27 per cent of business trips involved cross-river travel and many businesses report that congestion at existing crossings directly impacted their operations.

Awareness of the Silvertown Tunnel was high and growing, with over 50 per cent of surveyed businesses anticipating operational benefits from the improved connectivity.

The tunnel is expected to reduce congestion at the Blackwall Tunnels, improve travel time reliability and enhance access for businesses and residents alike. For the logistics and distribution sectors, which make up 27 per cent of businesses in the study area, the new crossing could significantly improve supply chain efficiency.

7.4 Residents surveys

Sample composition

The baseline residents' surveys were conducted face to face in residents' homes across the study area, which included the boroughs of Hackney, Tower Hamlets, Newham, Redbridge, Barking & Dagenham, Waltham Forest, Southwark, Lewisham, and Greenwich. Note that the study area for the survey included different spatial proportions of the host boroughs, which affects the available sample size in each borough. While a useful means of disaggregating the results, differing levels of statistical robustness and representativeness mean that findings should not be compared at the borough level.

The timescales and achieved sample sizes were consistent across the three baseline waves in 2021, 2023 and 2024. The response numbers were 1,096, 1,027 and 1,098, respectively, making the total consolidated number of responses for the pre-opening analysis 3,221 individuals.

Respondents' profile

Basic statistics relating to the composition of the survey sample are set out in the Silvertown Tunnel socio-economic monitoring contractor reports, although this should not be taken as a definitive characterisation of the demographics of the study area. In terms of working status, home ownership, household income and social grade:

- Nearly two-thirds (65 per cent) of respondents declared to be working full or part time, followed by those not working (for example retired or looking for work), at 16 per cent. A further 11 per cent were looking after family and home and seven per cent studying full or part time.
- Most respondents (60 per cent) stated that they rent their home, 24 per cent owned it with a mortgage and 11 per cent were outright owners.
- The surveyed population was primarily spread across three annual household income bands: under £20,000, £20,000 to £40,000, and £40,000 to 75,000, with around a fifth in each group. Less than one in ten had a household income over £75,000. One

quarter (24 per cent) preferred not to disclose this information and a further eight per cent did not know the answer.

- Social grade is calculated from questions about the household's chief income earner and their employment and responsibilities. Social grade is used for comparison throughout this report as a proxy for income. Around half of respondents were graded ABC1 (52 per cent), while 42 per cent were graded C2DE. Six percent of the sample declined to provide an answer.

On average, 51 per cent of respondents had access to a car or van for personal use, with an increase since 2021 but stabilising at 53 per cent in 2024. However, the number of people with access to a cycle for personal use decreased from 35 per cent in 2021 to 28 per cent in 2024. On average, 32 per cent of respondents had access to a cycle.

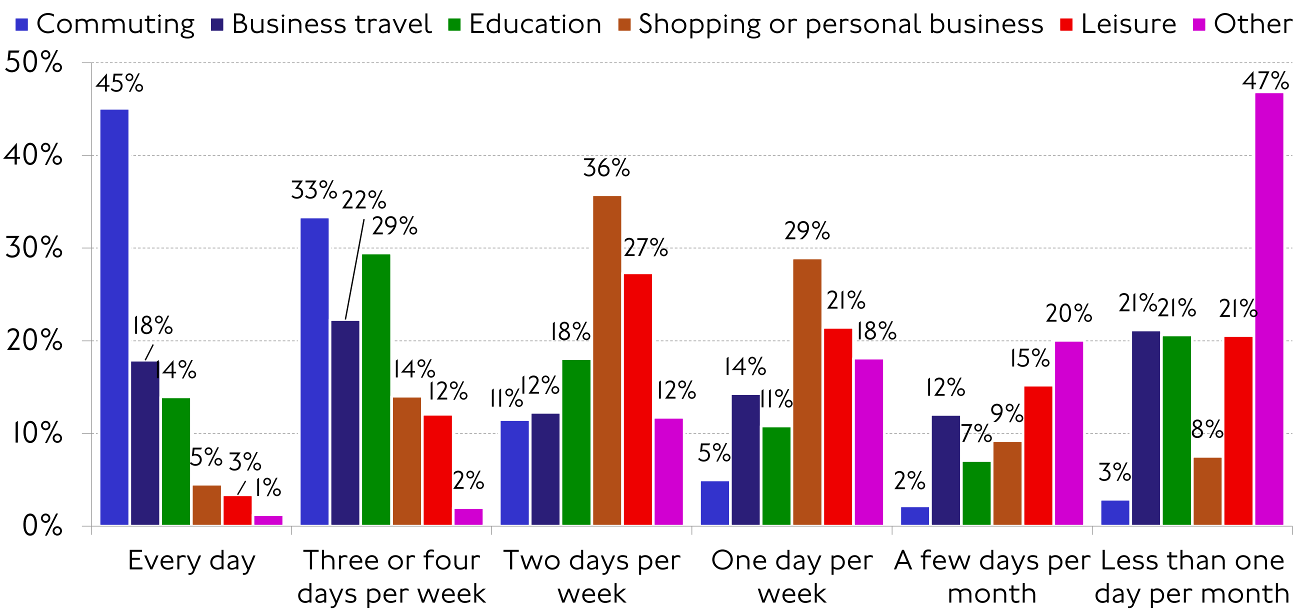
General travel patterns

To understand how the new Silvertown Tunnel might impact local travel, questions were asked within the residents' survey to understand the current travel patterns of respondents and provide a baseline for future comparison. Data describing the travel behaviour of study area residents is also available from our long-standing London Travel Demand Survey, which provides similar data for all London residents, thereby providing a basis for comparison. Both data sources will be used in conjunction to understand impacts on personal travel.

In the context of relatively small-area, small-sample studies such as this, the limitations imposed on comparisons due to sample size should be recognised. However, it is expected that the scale of change to local travel resulting from the new tunnel will be such as to be visible in these sources after the opening. In the pre-opening period, the specific patterns are largely of intrinsic interest and their primary role is to act as a baseline for future comparison.

Looking first at **journey purpose**, figure 7.16 shows the distribution of the number of times that respondents said they travel for each purpose.

Figure 7.16 Journey purpose distribution by trip frequency, 2021, 2023 and 2024 combined.



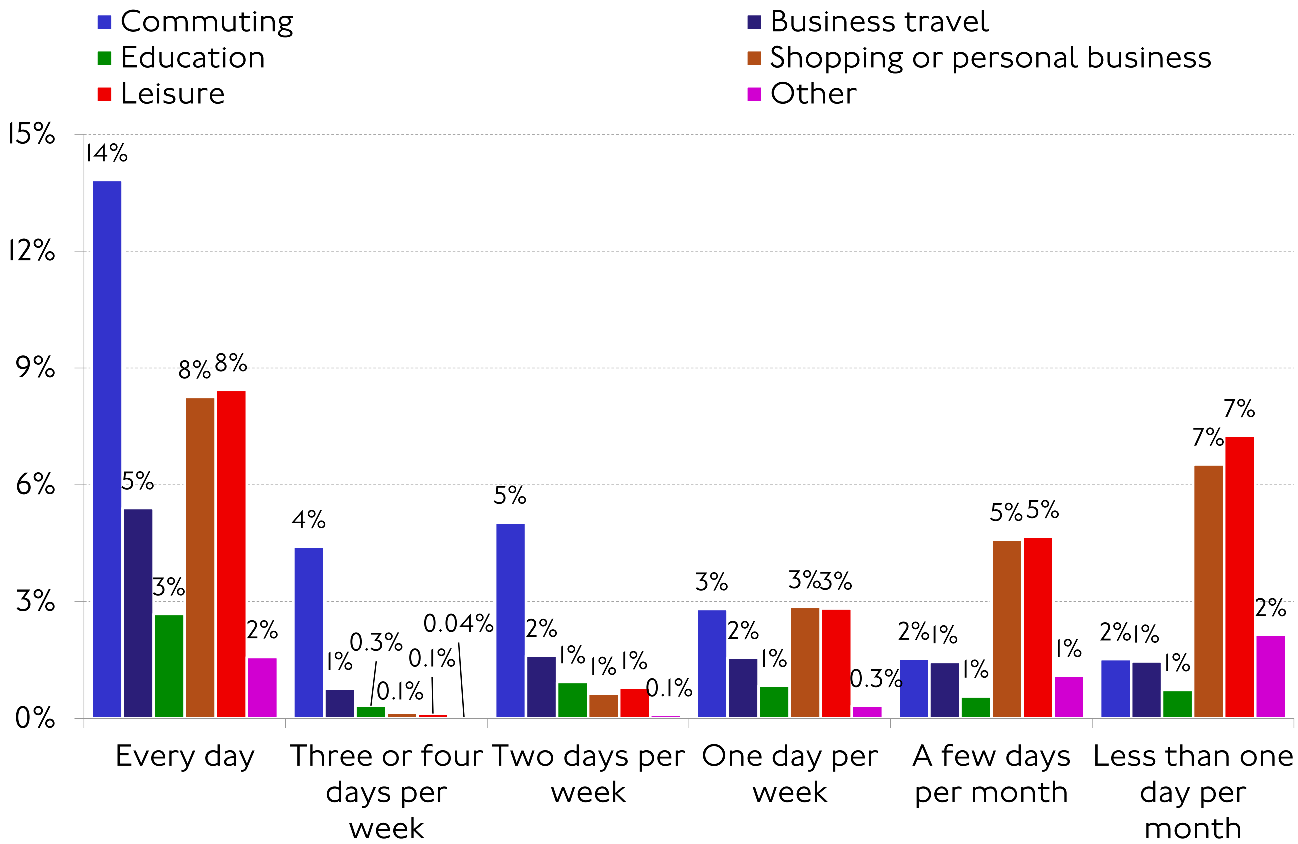
Source: Steer, on behalf of Transport for London.

Most respondents (78 per cent) commuted at least three days per week, with correspondingly lower values for other frequencies. Business travel was more evenly distributed, with 22 per cent travelling three or four days per week for this purpose, 18 per cent daily and 21 per cent travelling less than once a month. Travel for education was most frequently undertaken three or four days per week (29 per cent), while travel for shopping or personal business occurred most frequently two days per week (36 per cent) and once a week (29 per cent), with only five per cent of respondents shopping every day.

In terms of **cross-river movements**, trips for leisure had the highest proportion of people crossing the river, with 57 per cent of respondents saying they did so. Shopping or personal business involved cross-river trips for 49 per cent of respondents, followed by travelling to and from work, at 32 per cent.

Daily crossings (figure 7.17) are primarily driven by travel for work, business and education. In contrast, shopping or personal business and leisure see much lower rates of daily travel. This suggests that essential activities like work and education are the main drivers of frequent river crossings.

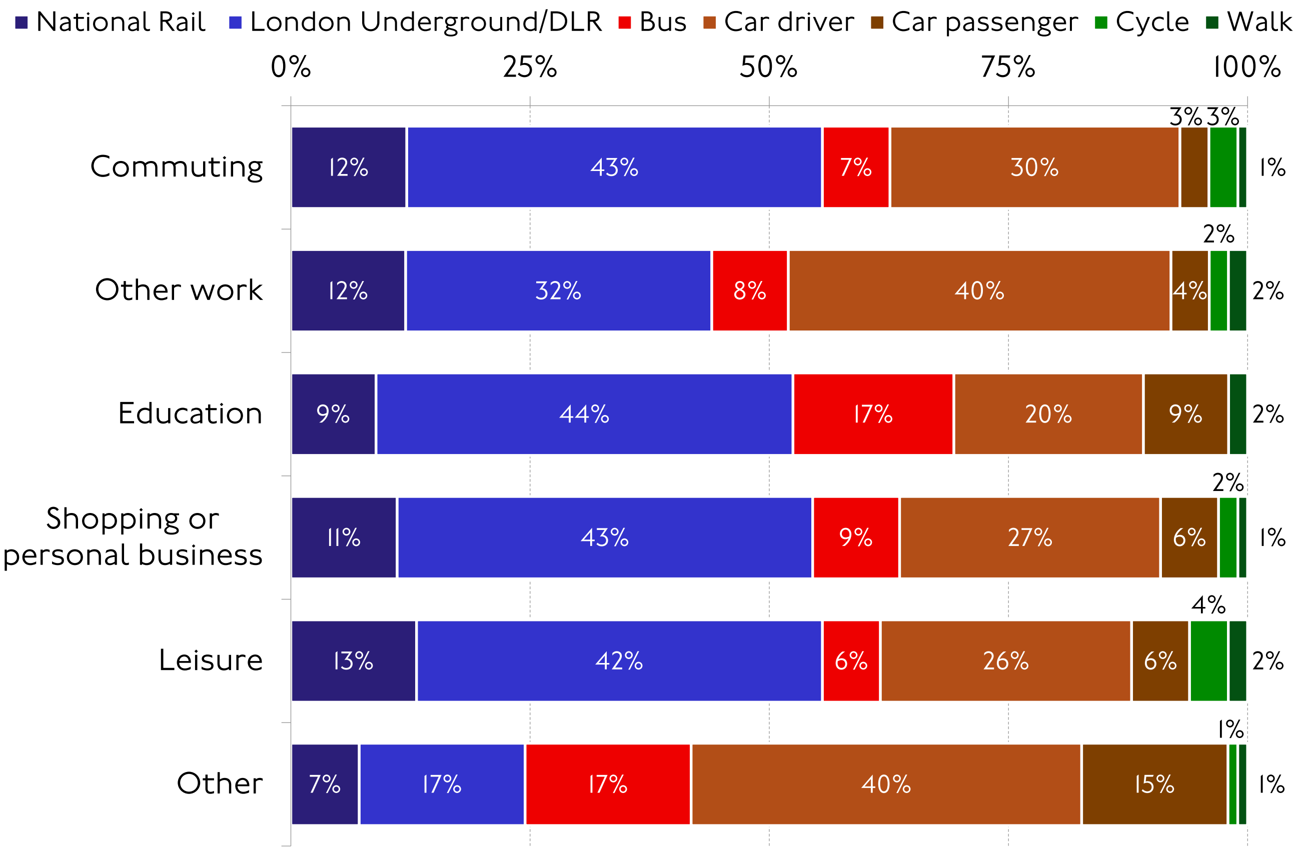
Figure 7.17 Proportion of trips that cross the river Thames by trip frequency and journey purpose, 2021, 2023 and 2024 combined.



Source: Steer, on behalf of Transport for London.

Considering the **modes used for cross-river trips**, figure 7.18 shows the modes of travel used for different travel purposes to cross the Thames once a week or more often.

Figure 7.18 Mode share of regular (once a week or more) cross-river trips by journey purpose, 2021, 2023 and 2024 combined.



Source: Steer, on behalf of Transport for London.

The London Underground or DLR was the most popular option for commuting (43 per cent), business travel (32 per cent) and education (44 per cent), as well as shopping or personal business (43 per cent) and leisure (42 per cent), reflecting its critical role in Thames crossings in east London. Cars, either for drivers or passengers, were also significant, with 30 per cent of respondents commuting as drivers and 40 per cent driving cars for business travel. However, car usage was much lower for education (20 per cent) and leisure (26 per cent). Buses were mainly used for education (17 per cent) and less for other purposes, with seven to nine per cent using them for commuting and shopping or personal business. National Rail saw moderate use across all categories, peaking at 13 per cent for leisure.

Cycling and walking had minimal representation in frequent cross-river travel, with only three to four per cent of respondents cycling for work or leisure and one to two per cent walking all the way across most purposes. This indicates that active travel options were underutilised compared to motorised and public transport modes. Overall, the reliance on public transport, particularly the London Underground and the DLR, highlights its importance for frequent and varied travel, while private cars remained prominent for business and other less frequent journeys.

There was little evidence of people frequently changing their main mode of transport, with 92 per cent of respondents saying they had not changed their main mode of transport for the cross-river journeys within the last year. Of the eight per cent that did change their mode, this was due to factors such as congestion and the high costs of running a car as well as public transport travel times, cost and reliability. There were differences between the waves, with an uptick in 2021 of concerns about the coronavirus pandemic for the main reason of changing mode, while in 2023 and 2024 most responses were around congestion and the cost of travel.

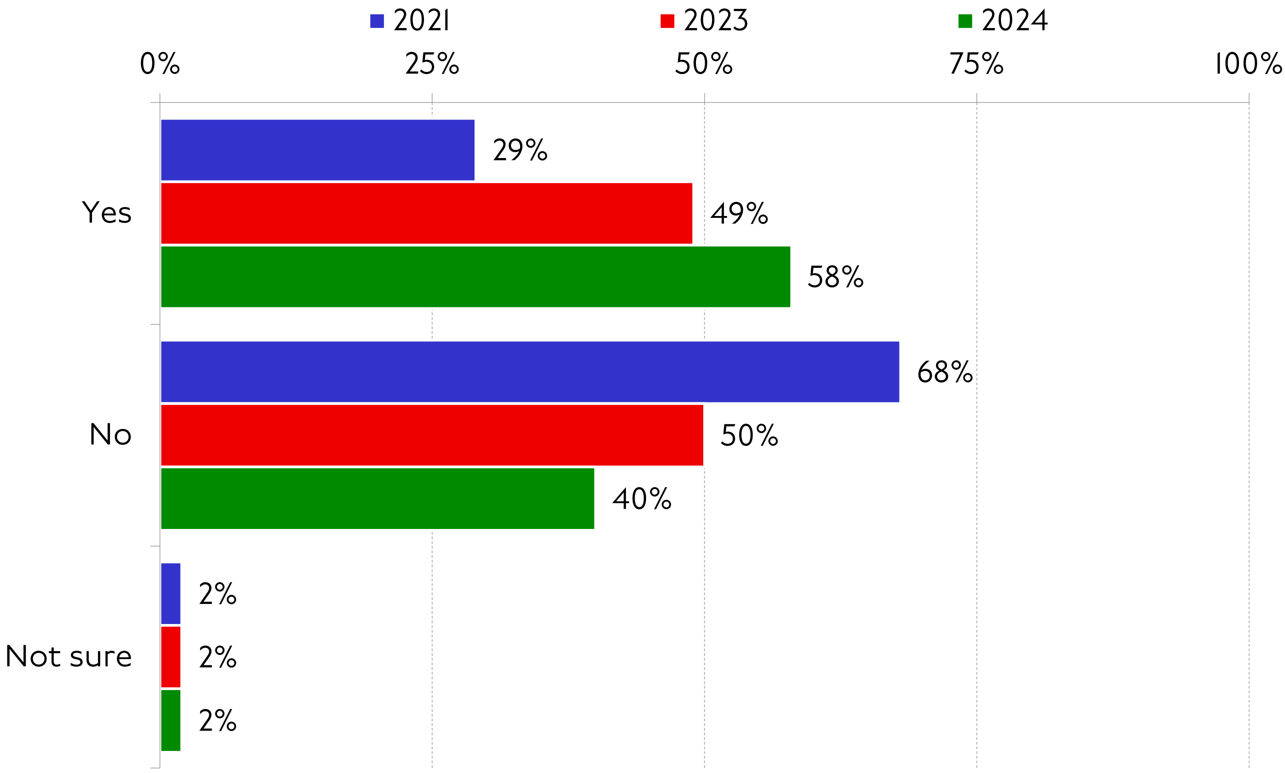
When asked about the **ease of crossing the river**, 41 per cent of respondents stated that it was not easy. Respondents who stated that it was not very easy to get across the river in east/southeast London stated traffic congestion on the approach to the crossing as the main barrier (58 per cent), followed by not having a convenient crossing nearby (33 per cent), taking too long to reach a crossing (31 per cent) and lack of transport such as buses not serving the required route (13 per cent) or trains/London Underground/DLR not serving the required route (10 per cent).

Public awareness of the new Silvertown Tunnel

The number of respondents who were aware of the tunnel consistently increased every year of the survey up to close to 60 per cent of respondents in 2024 saying that they were aware of the tunnel (figure 7.19).

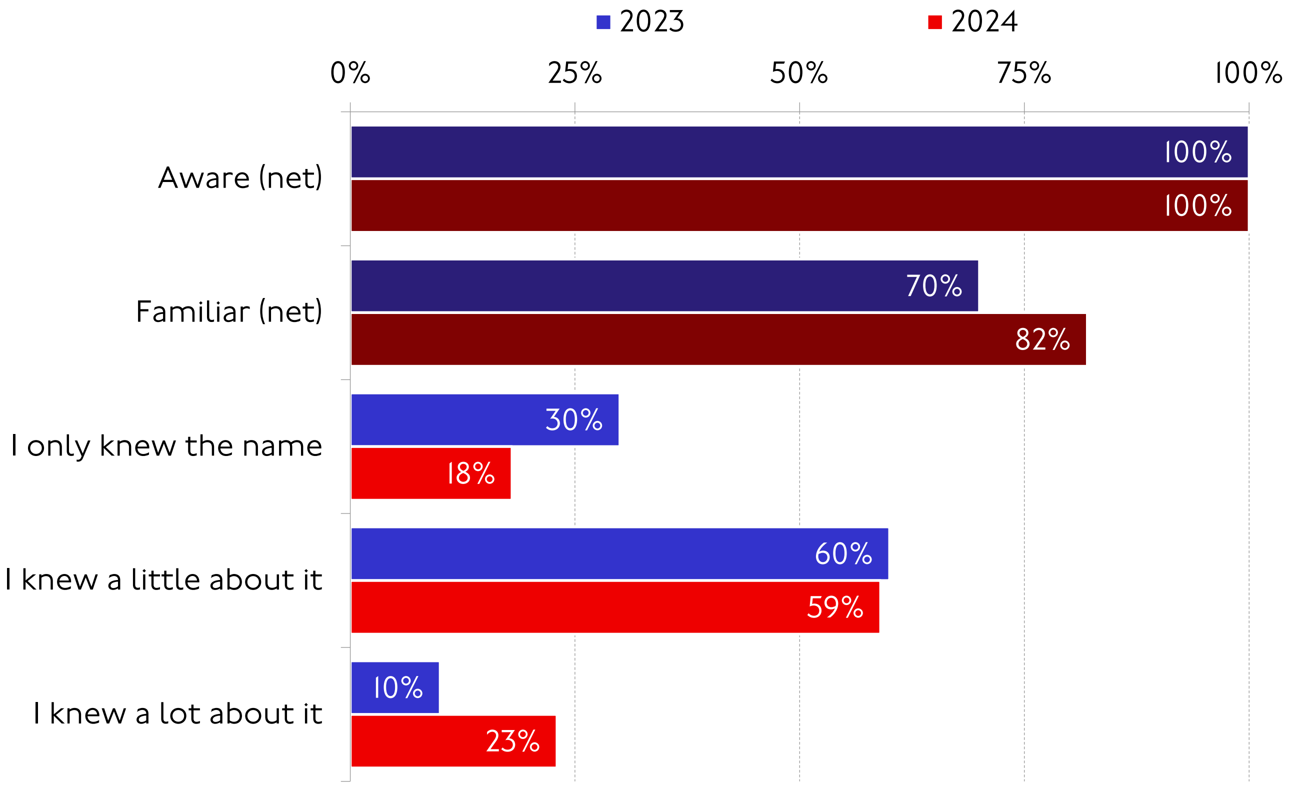
For respondents who were aware of the tunnel, figure 7.20 shows the self-declared level of knowledge prior to the survey. This question was only asked in the 2023 and 2024 waves of the survey and shows, as would be expected, an increase in awareness between the two waves.

Figure 7.19 Residents' awareness of the Silvertown Tunnel before the survey, by year, 2021, 2023 and 2024.



Source: Steer, on behalf of Transport for London.

Figure 7.20 Residents' (who are aware of the Silvertown Tunnel) degree of knowledge about it, by year, 2023 and 2024.



Source: Steer, on behalf of Transport for London.

Summary of baseline conditions

Residents' travel patterns in the study area demonstrated substantial reliance on limited river crossings, particularly the Blackwall Tunnels, which suffer from congestion and delays. South-to-north commuting was predominant, with many residents accessing employment hubs such as Canary Wharf, Stratford and the City of London.

Public transport was widely used, accounting for 33 per cent of all trips in the study area, which is higher than the Greater London average of 27 per cent. However, significant constraints persisted, particularly in areas with lower PTAL, concentrated in the north, east, and southeast of the study area.

Active travel modes (walking and cycling) accounted for 40 per cent of all trips but were hindered by limited options for cross-river trips. The Silvertown Tunnel should help address these constraints by providing an additional cross-river route, specifically enabling new bus services (including a dedicated cycle shuttle) that cannot currently use the Blackwall Tunnels due to height restrictions.

7.5 Social and economic impacts: forward look

The social and economic impacts of the scheme will take time to emerge as residents and businesses adapt to the new connectivity provided. Over this longer term it is likely that external determinants, for example wider economic trends, will be the predominant influence on social and economic wellbeing in the area around the tunnel. However, some indications within the data that residents and businesses are making use of, and benefitting from, the new connectivity provided should be expected in future waves.

The first post-opening waves of the businesses' and residents' surveys will therefore be undertaken in autumn 2025, providing a first comparison of key indicators with the baseline. Similar surveys are planned in the following two years, alongside the continued collation and analysis of secondary indicators as they arise. These first-year reports will be made available via the STIG website, expected to be in early 2026.