

Investment programme report

Quarter 4 2023/24
(10 December 2023 to 31 March 2024)

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An aerial photograph of London, England, showing a dense urban landscape with numerous skyscrapers and buildings. The River Thames is visible in the middle ground, winding through the city. In the foreground, several prominent skyscrapers are visible, including the Gherkin (30 St Mary Axe) with its distinctive diamond-patterned glass facade. The background shows a vast expanse of the city stretching towards the horizon under a clear sky. A white text box is overlaid on the left side of the image.

Introduction

Our investment programme comprises projects to maintain the reliability of the network and support growth in the capital



Safe, efficient services are fundamental to London's way of life

Purpose and scope

Purpose

Transport for London (TfL) is part of the Greater London Authority (GLA) family led by Mayor Sadiq Khan. We are the integrated transport authority responsible for delivering the Mayor's aims for transport.

We run most of London's public transport services, including London Underground, London Buses, the DLR, London Overground, Elizabeth line, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the IFS Cloud Cable Car. The quality and accessibility of these services is fundamental to Londoners' quality of life. By improving and expanding transport, we can make people's lives easier and increase the appeal of sustainable travel.

We are moving ahead with many of London's most significant infrastructure projects, using transport to unlock growth. Supporting the delivery of high density, mixed-use developments that are planned around active and sustainable travel will ensure that London's growth is good growth. We also use our own land to provide thousands of new affordable homes and our supply chain creates tens of thousands of jobs and apprenticeships across the country.

Scope

The report gives a progress update on the programmes and major projects that seek authority each year from the Programmes and Investment Committee. It includes programmes of renewals and enhancements to maintain reliability and support growth. Renewing and replacing our assets is our required baseline to maintain our current performance in terms of safety, reliability, capacity and asset

condition. Additional enhancements can unlock new capacity and enable us to use our existing network more intensively.

This report covers Quarter 4, which runs from 10 December 2023 to 31 March 2024. For each key project or programme, the financial and milestone data represent the position at the end of Quarter 3, with commentary on key achievements, progress and challenges. It also updates on notable progress since the last report.

The data displayed differs depending on whether the programme or portfolio has a finite scope to deliver:

- For projects with a finite scope, financial records of spend to date, authority and estimated final cost (EFC) are provided, which represent the entire duration of the programme or portfolio except where stated. For these projects, a completion date is also provided, indicating the year and which quarter the specified event will occur
- For ongoing portfolios that aggregate a number of projects, financial records of spend to date and forecast cost are provided for a discrete period of time

Numbers in brackets represent a deficit in the figure or a decrease since the last report; numbers without brackets represent a surplus in the figure or an increase since the last report. Where financial information is commercially sensitive, it has been redacted. The performance over time graphs illustrate financial performance over the last four quarters. The commentary alongside the graph explains any specific trends or changes to trends over a snapshot in time.

Investment programme delivery structure

Our investment programme is delivered by the areas of business set out below. This is reflected in this structure of the report

Since Quarter 1 2023/24, a new structure has been established for the report to reflect the new organisational structure under Capital. There may be further small changes over time to refine parts of the structure, however at present it comprises the following areas:

Major projects

This includes our largest and most complex projects. It comprises line upgrades such as the Piccadilly line upgrade and the Four Lines Modernisation programme, as well as network extensions, major station upgrades and the Elizabeth line.

Rail and station enhancements

This brings together London Underground and surface-related enhancements. In particular, where there are links to third-party developments and funding, it recognises the similarities in the activities involved and the outcomes that they deliver.

It includes the HS2 programme, Elephant & Castle station capacity upgrade project, the East London line, Surrey Quays station, Canada Water bus station, Signalling enhancements and power reinforcements, Tram replacement rolling stock, DLR Royal Docks and DLR Thames Wharf.

Safe and healthy streets

This programme comprises Cycling infrastructure, Vision Zero, Bus priority and Bus safety, among others.

It recognises the importance of holistic investment in the bus network, alongside cycling and walking, to increase travel by sustainable modes.

Similarly, the addition of bus safety schemes such as intelligent speed assistance alongside the Safer Junctions and Lowering speed limits programmes aligns activities to improve safety on London's road network.

Environment

This includes the London-wide Ultra Low Emission Zone (ULEZ), Direct Vision Standard phase two, Electric vehicle infrastructure, Zero-emission bus fleet, Waste heat, Solar private wire and Buildings decarbonisation, while also reflecting the new green project pipeline that is being developed.

Technology

This programme comprises two technology programmes. Operations technology covers activities such as Enforcement, compliance, safety and security, Network and public transport management, Cycling and micromobility, Connectivity and Digital asset management.

Technology and data includes projects focusing on Oyster card payment, contactless payment, the Tfl Go app and several projects relating to our internal technology services

These have separate governance despite sharing common resources, stakeholders and delivery of strategic outcomes.

Streets, bus and rail-sponsored services renewals

This groups together renewals of Streets, Buses, River Services, London Overground, DLR and London Trams.

These programmes share a common approach to work-bank management and by combining associated activities such as bus-focused renewals, we can improve investment prioritisation and efficiency.

London Underground renewals

This covers two main London Underground renewals activities – Train systems and Infrastructure.

Grouping these activities enables a more holistic oversight and prioritisation in managing renewals across programmes. In addition, this programme incorporates Railway systems enhancements and Elizabeth line renewals.

Our performance

We measure the safety and milestones progress of our investment programmes schemes



Environmental initiatives

Air quality

London-wide ULEZ

The ULEZ successfully expanded London-wide on 29 August 2023, ensuring five million more Londoners can breathe cleaner air.

The First-month report, published in October 2023, showed the scheme to be highly effective at reducing the proportion and number of older, more polluting vehicles on London's roads; 95 per cent of vehicles seen daily driving in London now meet ULEZ standards.

While this report does not cover the impact of the scheme on air pollutant emissions and concentrations, we continue to monitor the impact of the London-wide expansion of the ULEZ and will report on preliminary analysis of air quality impacts in the Six-month report, with a fuller analysis in the One-year report.

The total scrappage fund increased to £160m in August 2023, and to £210m in February 2024, due to the continued high demand for the scheme and its importance in supporting Londoners to change to less polluting vehicles. As of 3 March 2024, data shows that 49,361 applications have been approved and more than £169m has been committed. With millions in scrappage funds still available, there is still support for those who need it.

In March 2024, the Mayor launched an expanded ULEZ scrappage scheme to give applicants the option to donate their non-compliant vehicles to the Ukraine, via a trusted partner, for humanitarian purposes. Those choosing to donate their vehicle receive the same grant payment as those who choose to scrap their vehicle.

A number of ULEZ support offers were also secured to help Londoners (irrespective of whether they received a scrappage grant) save money and use greener, cleaner forms of transport. This includes offers from more than 30 partners, offering money off hire and subscription services for bikes, e-bikes, cargo bikes and e-scooters, discounts on car clubs and many other great deals. To date, there have been more than 2,000 redemptions of these offers.

Additionally, we offered a set of temporary exemptions ('grace periods') to support disabled people, community transport minibuses, people using wheelchair-accessible vehicles, and businesses and charities with brand-new compliant vehicles or a retrofit solution on order. More than 6,600 applications have been accepted to date for these grace periods.

Climate emergency

Net Zero Matrix team launch

The Net Zero Matrix team was officially launched on 28 February 2024 to support and accelerate delivery of our net zero commitments. The team will manage set up, delivery and oversight of programmes and projects with the primary objective of reducing our operational carbon emissions to net zero by 2030. The team is made up of colleagues from across TfL.

Zero-emission buses

Decarbonisation of the London bus network remains a priority as we transition towards a net zero London. We have achieved and exceeded our 2023/24 target of 1,400 zero-emission buses by the end of the financial year. With 1,418 zero-emission buses operating across London, approximately 16 per cent of our bus fleet is now zero-emission at tailpipe.

London has the largest zero-emission bus fleet in western Europe. The Mayor has committed to delivering a zero-emission fleet by 2030 and we are working on plans to accelerate this, contributing to cleaner air for London and an estimated saving of 5.5m tonnes of carbon by 2030.

LED upgrades across the network

To date, 95 per cent of bus shelters, 67 per cent of street lighting on our road network and 43 per cent of London Underground stations have been converted to LED lighting. This consumes approximately 57 per cent less energy than fluorescent lighting while providing brighter light in our public spaces and a safer network for our customers, especially those travelling at night.

Public sector decarbonisation scheme

We have been awarded £16.3m grant funding from the Public Sector Decarbonisation Scheme. This funding is awarded for decarbonisation initiatives and will be used for improvements across our sites to reduce our reliance on fossil fuels and help us get closer to reaching the target of a net zero London.

£2.3m will be used to carry out heating decarbonisation initiatives at Neasden depot and Finchley Central signals depot. £14m will be used to reduce the carbon emissions of six head office buildings across our estate. Installations will include heat pumps, solar panels, LED lighting, improved glazing and wall insulation.

Internal processes to sign off on the grant income are now underway, with steps towards delivery starting in the coming months.

Carbon literacy accreditation

In February 2024, we were awarded a carbon literacy bronze accreditation by the Carbon Literacy Project, marking the milestone of every chief officer, including the Commissioner, completing and becoming certified in carbon literacy. We also achieved our 2023/24 scorecard target to train 3,000 colleagues in carbon literacy nearly two months early. This was made possible by a network of 75 volunteer trainers and nearly 20 volunteer coordinators from across TfL who delivered our Carbon literacy programme. Since the training began in July 2022, we have trained more than 4,500 colleagues.

Climate change adaptation

We hosted the last of two series of workshops: one with all London boroughs to identify London's highways climate risks and appropriate mitigation actions, and another with other infrastructure sectors (such as power, water and communications) to identify our key interdependent climate risks and appropriate mitigation actions. The results of these projects will feed into our fourth Adaptation Reporting Power submission to the Department for Environment, Food and Rural Affairs at the end of 2024.

We have begun a project exploring the integration of weather hazards as a contributory factor in TfL incident reporting systems. If successful, this would allow us to better understand the impact of severe weather on our current operations. In combination with the Met Office's climate projections data, we could then better assess likely future impacts and use this to influence business planning.

Green infrastructure and biodiversity Green infrastructure and biodiversity plan published

On 7 March 2024, we published our first [Green infrastructure and biodiversity plan](#). This is aligned with the TfL Corporate environment plan and sets out how we will care for and improve green infrastructure and biodiversity across our estate.

We are one of London's largest landowners. Almost a third of our land is covered by vegetation and supports more than 1,000 animal species and 700 plant species. Many of these species are legally protected and their habitats must be preserved. Increasing green infrastructure and biodiversity on our network helps London to adapt to climate change and encourages active travel.

The plan captures in one place our existing relevant targets, legal requirements and policy commitments while also setting out strategic actions to deliver against these.

Key targets include:

- Achieving a 10 per cent biodiversity net gain on applicable schemes from February 2024
- Delivering a net gain in biodiversity across our estate by 2030, compared with the 2018 baseline
- Increasing tree canopy cover across TfL by 10 per cent by 2050, compared with the 2016 baseline
- Doubling our wildflower verges to 260,000 square metres in 2024 (after doubling them to almost 130,000 square metres in 2023)

- Installing 5,000 square metres of sustainable drainage systems across our network every year. This not only includes measures to help reduce the amount and/or slow the flow of rainwater reaching London's drainage networks but also includes nature-based solutions such as rain gardens, roofs planted with vegetation and wetlands. Nature-based solutions have several advantages, such as supporting biodiversity and improving the visual appeal of the urban realm. A green and well-adapted road network helps encourage active travel across the city in line with our Healthy Streets approach. It can also help reduce road runoff pollution from tailpipe emissions and brake wear
- Further reducing the use of pesticides and eliminating them where operationally and financially feasible

PPE recycling trial

Capital has launched a six-month personal protective equipment (PPE) recycling scheme trial, in collaboration with our PPE providers Hayley Rail and Avena Group. This is a new, low-cost scheme where all end-of-life PPE items can be placed in specialist recycling bins located at our offices.

PPE items will be collected by Avena Group and either recycled into alternative materials such as soundboards, insulation, or geotextiles, or converted into pellets for refuse-derived fuel. Avena have estimated that we will save 40,404kg of carbon dioxide emissions and 3,120 litres of water per annum with this scheme, compared to general waste disposal of PPE or uniforms.



Our green estate supports 700 plant and 1,000 animal species

Safety performance

The full safety report on the network is reported in the Safety, health and environment report. The update for Quarter 4 below is for the programmes mentioned in this Investment programmes report.

Capital

Capital includes all activity under the Chief Capital Officer and maintenance activity under the Chief Operating Officer. In Quarter 4, our Capital programmes and projects delivered a combined total of 1.4 million site-based hours, an increase of 0.2 million on the previous quarter.

Quarterly performance

There were no incidents reaching the threshold for reporting under the Reporting of Injuries Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR). The RIDDOR accident frequency rate for Capital remained stable at 0.04 and ended the year below the target of 0.10. In total, there were two incidents that required reporting under RIDDOR during 2023/24, in line with 2022/23.

There was one lost-time injury in Quarter 4. The lost-time injury frequency rate ended the year at 0.11, below the target of 0.20.

In total, there were only four injuries (minor, with no common cause), in the quarter and 22 throughout 2023/24. This is a 49 per cent reduction in injuries compared with 2022/23 and an 80 per cent reduction over the past five years. During the same period, hours worked have fallen by 52 per cent as several major projects have concluded, demonstrating a reduction in risk and Capital's continued progress towards our zero harm ambitions.

The reduction in injuries is indicative of an improvement in safety performance across the wider UK construction industry over the past decade. However, our safety performance compares favourably to similar client organisations, with Capital's accident, lost-time and RIDDOR frequency reporting rates significantly below the sector average.

To maintain our positive progress towards zero harm, we thoroughly investigate every injury, using the learnings to address root causes and make continuous improvements. This year, the most common root causes of injury related to poor communication, inadequate safe systems of work and asset conditions.

Significant Capital incidents

On 26 December 2023, an in-service train overran the platform at Shepherd's Bush Market by approximately 30 metres. The Four Lines Modernisation programme and associated engineering team are supporting the ongoing investigation and liaising with our supplier, Thales. The Office of Rail and Road have requested to be kept apprised as the investigation progresses.

Improvement activity

The most significant incidents have been those relating to vandalism and work-related violence and aggression directed towards both people and assets that perpetrators believe to be connected with the expanded ULEZ. The workers of our suppliers are facing significant threats, and this is also a major concern for our colleagues who carry out work in public areas.

As referenced in the Quarter 3 report, we have worked with our Compliance, Policing, Operations and Security team. We now have specific Capital-orientated guidance to support us in managing the risks from violence and aggression. It provides advice to enable managers to consult with their team on the most suitable or effective options for their specific circumstances. This now complements other existing support such as the Urban Safety course.

Zero Harm conference and Suppliers SHE awards ceremony

This event, organised by our Safety, Health and Environment team, took place in February at City Hall, hosted by our Chief Capital Officer, Stuart Harvey, and Chief Safety, Health and Environment Officer, Lilli Matson.

We were joined by TfL suppliers from across the UK, who shared some of the incredible work they are doing. This includes reducing carbon from construction, reducing other harmful emissions such as nitrogen oxides, supporting the wellbeing of their people, avoiding buried services, and managing potential harm from respirable silica.

Morgan Sindall won three awards, for Outstanding Safety, Health and Environmental initiatives. Hayley Rail were awarded for Outstanding Carbon Reduction Initiative, while Taylor Woodrow won an Outstanding SHE Innovation award for robotic cutting technology. Innovations were showcased.

Hinkley Point benchmarking

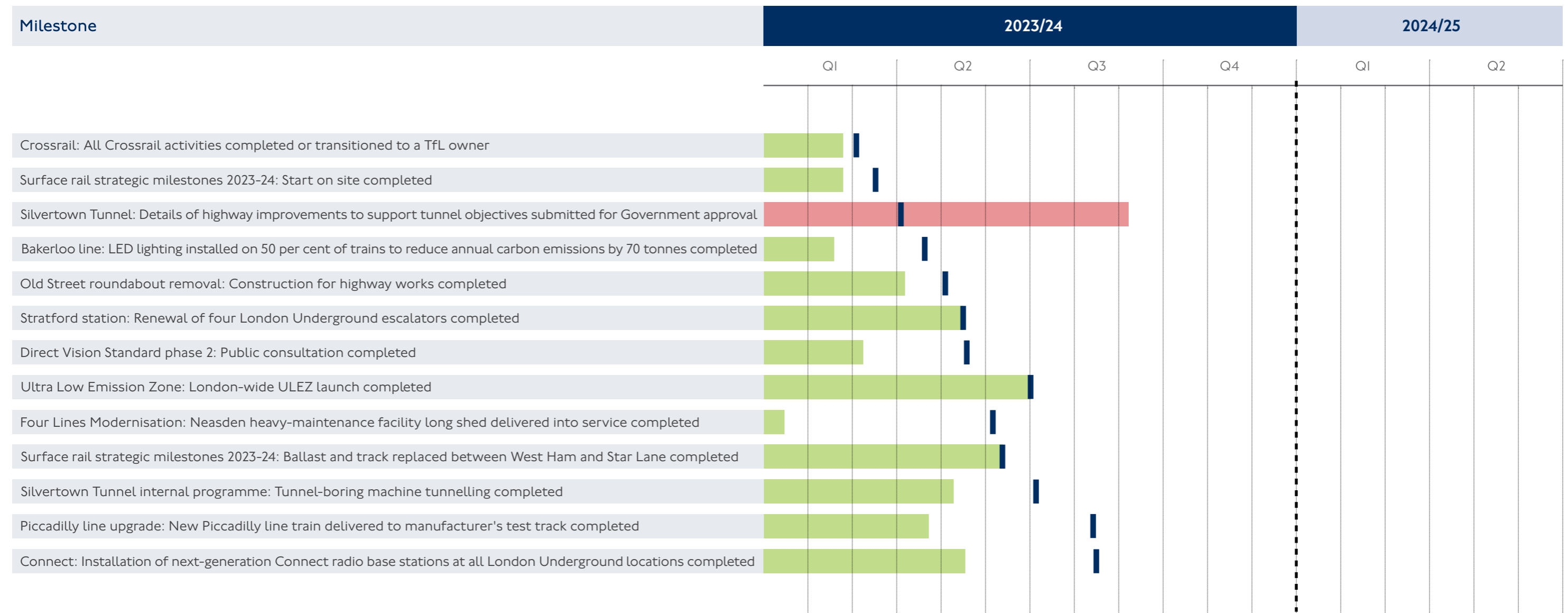
We regularly benchmark performance and share good practice with other organisations. On 20 December 2023, we visited the Hinkley Point C nuclear power station construction site to establish a channel of collaboration and learning between our respective capital teams. The initial visit focused on fire safety, with a follow-up discussion on construction, design and management duties.

Strategic milestones

At the end of this year we have delivered 23 of the 28 milestones set for the year

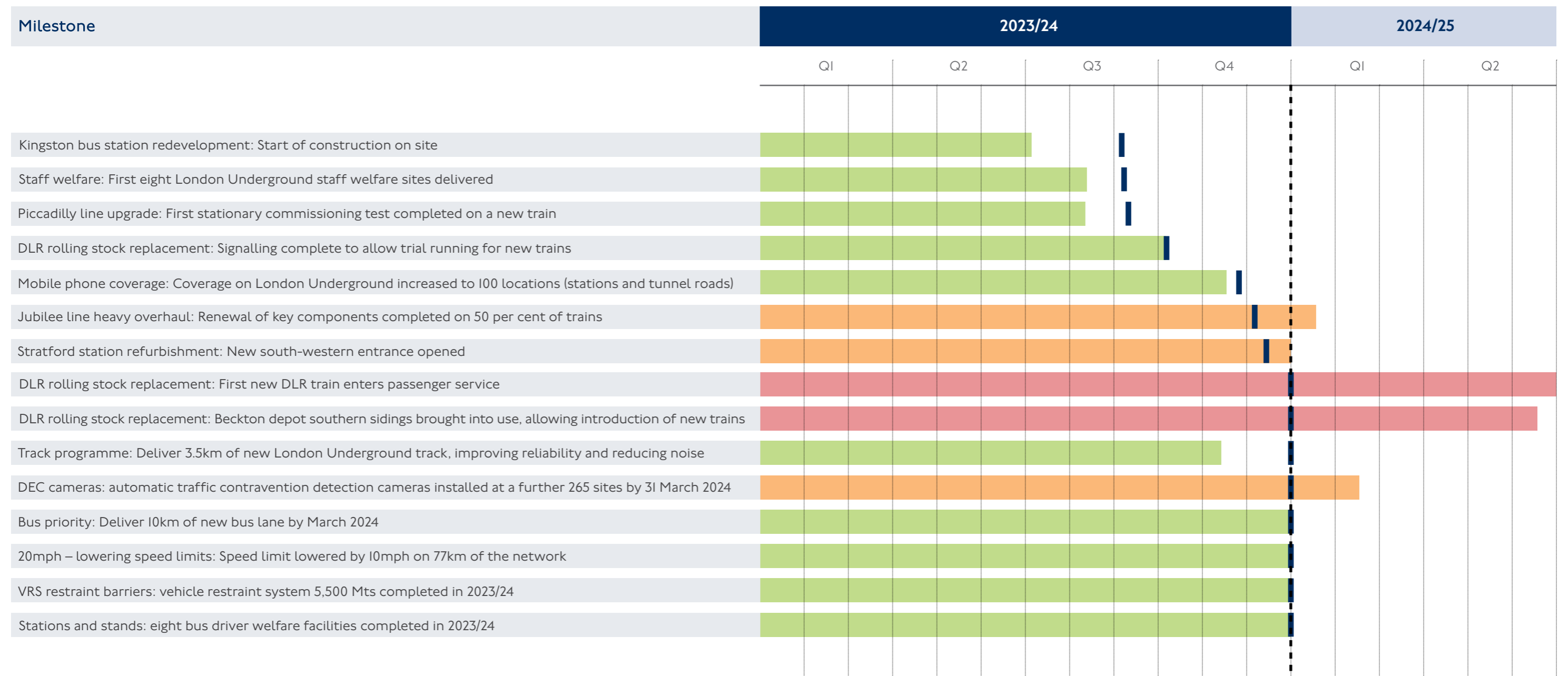
Twelve strategic milestones were forecast for completion in Quarter 4. Of these, we delivered three on time, while four milestones were completed early. Five of the 12 milestones scheduled for completion in Quarter 4 are forecast to be late.

Below are our strategic milestones for 2023/24. The solid blue bar shows when the milestone was due to be met, while the green, amber and red blocks show when it was achieved, or is forecast to be achieved.



■ Delivered on time or earlier than planned
 ■ Delivered less than 90 days later than planned
 ■ Delivered more than 90 days later than planned
 ■ Planned delivery date
 Reporting period cut off by 31 March 2024

Strategic milestones 2023/24 (continued)



■ Delivered on time or earlier than planned
 ■ Delivered less than 90 days later than planned
 ■ Delivered more than 90 days later than planned
 ■ Planned delivery date
 Reporting period cut off by 31 March 2024

Schedule performance

Below are the milestones for the financial year 2023/24.

Four were achieved on time, 18 were achieved early and one was achieved late

Milestones achieved on time

Environment - ULEZ

London-wide ULEZ Go-Live – Q2 2023/24

Safe and healthy streets – Bus Priority

10 km of new bus lane to be delivered by March 2024 – Q4 2023/24

Safe and healthy streets – Lowering speed limits

Lowering the speed limit by 10 mph on 77km of the network – Q4 2023/24

Street, bus and rail-sponsored service renewals – Staff welfare

Eight bus drivers welfare facilities completed in 2023/24 – Q4 2023/24

Milestones achieved early

Crossrail

All Crossrail activities completed in transitioned to a TfL owner – Q1 23/24

Street, bus and rail-sponsored service renewals – East London line - Surrey Quays

Start on site – Q1 2023/24

London Underground renewals - Bakerloo line

Reduce annual carbon emissions by 70 tonnes by installing energy-saving LLED customer lighting on 50 per cent of Bakerloo-line trains – Q1 2023/24

Environment – Direct Vision Standard phase 2

Completion of public consultation – Q1 2023/24

Four Lines Modernisation

Deliver into service Neasden heavy maintenance facility long shed – Q1 2023/24

Safe and healthy streets

Old Street roundabout removal – completion of construction for highway works – Q2 2023/24

London Underground renewals

Stratford - Complete renewal of four escalators – Q2 2023/24

Street, bus and rail-sponsored service renewals

Replacing ballast between West Ham and Star Lane – Q2 2023/24

Silvertown Tunnel

Silvertown tunnel-boring machine completes tunnelling – Q2 2023/24

Piccadilly line upgrade

New Piccadilly line train delivered to the manufacturer's test track – Q2 2023/24

Technology - Connect

Complete installation of next-generation replacement Connect radio base stations at all London Underground locations, improving reliability – Q2 2023/24

Street, bus and rail-sponsored service renewals — Kingston bus station

Kingston Cromwell Road bus station – Start of construction on site – Q3 2023/24

London Underground renewals – Staff welfare

Delivery of first eight London Underground staff welfare sites – Q3 2023/24

Piccadilly line upgrade

First stationary commissioning test complete on a new Piccadilly line train – Q3 2023/24

DLR rolling stock replacement programme

Signalling complete to allow trial running for new DLR Trains – Q4 2023/24

Technology – Mobile phone coverage

Increase the current mobile phone coverage on the London Underground to cover a total of 100 locations being made up of stations and tunnel roads – Q4 2023/24

London Underground renewals – Track programme

Deliver 3.5km of new London Underground track, improving reliability and reducing noise – Q4 2023/24

Street, bus and rail-sponsored service renewals

Vehicle restraint system – 5,500 Mts completed in financial year 2023/24 – Q4 2023/24

Milestones achieved late

Silvertown Tunnel

TfL submits details to the Secretary of State for approval of wider highway improvements that support the Traffic, Environmental and Socio-Economic objectives of the Silvertown Tunnel – Q3 2023/24

Milestones forecast to be late at the end of 2023/24

London Underground renewals - Jubilee line (fleet overhaul and component renewal) - completion of the renewal of key components on 50 per cent of Jubilee line trains

This strategic milestone target date was missed by 46 days. The refurbisher of the train wheels has experienced a number of issues since the start of the programme, including inaccurate material estimates, shortage of employees and issues with quality.

Rail and station enhancements – Stratford south-western entrance - Open new south-western entrance to Stratford station

The strategic milestone was not achieved this quarter, due to compressed timescales for assurance and identification of water ingress issues which required resolution.

DLR rolling stock replacement programme - First new DLR train enters passenger service

The first train in service milestone is delayed due to an issue encountered during integration testing. This does not impact the final date for completion of the fleet renewal.

DLR - Beckton depot and network infrastructure - Bring into use Beckton depot southern sidings, which will allow introduction of new DLR trains

This milestone will be impacted by the principal contractor for the northern sidings project, Buckingham Group, entering into administration, as the southern sidings can only be commissioned following the northern sidings commissioning. The delay achieving this milestone does not impact the final date for the completion of the fleet renewal.

Technology – Enforcement, Compliance, safety and security – Making London safer by installing automatic traffic contravention detection deployable enforcement cameras (DEC) at a further 265 sites in London by 31 March 2024

At the end of Quarter 4 we had installed 269 cameras, however they were not all live and operational owing to implementation issues and a change to Vehicle Certification Agency (VCA) legislation. As of the end of May, we have implemented an alternative solution to overcome the VCA changes and have installed 293 cameras, of which 165 are live. We are continuing to work with our suppliers to resolve implementation issues and are projecting to have 265 cameras live in Quarter 2 2024/25.



New DLR trains will enter service later this year

Major projects

This portfolio includes our largest and most complex projects. It comprises line upgrades such as the Piccadilly line upgrade, the Four Lines Modernisation programme and the Elizabeth line



Elizabeth line

Rolling stock

Forecast completion	Gross cost to date (£m)	Gross cost to go (£m)	Gross EFC (£m)	Programme and Project Authority (£m)	Variance: EFC versus authority (£m)
Q4 2024/25	1,002	5	1,007	1,149	142
Change since last Investment programme report					
No change	No change	No change	No change	No change	No change

Financial commentary

The cost to date relates to ongoing rolling stock work that will be completed in 2024/25.

Performance over time commentary

The forecast end date represents the delivery of the rolling stock and depot, including all additional changes. Since authority was awarded in 2013/14, the estimated final cost dropped from £1,090m to £1,007m because the trains have since been part of a sale and leaseback arrangement. They are now being leased and the costs charged as operational costs.

Programme update

Class 345 Trains

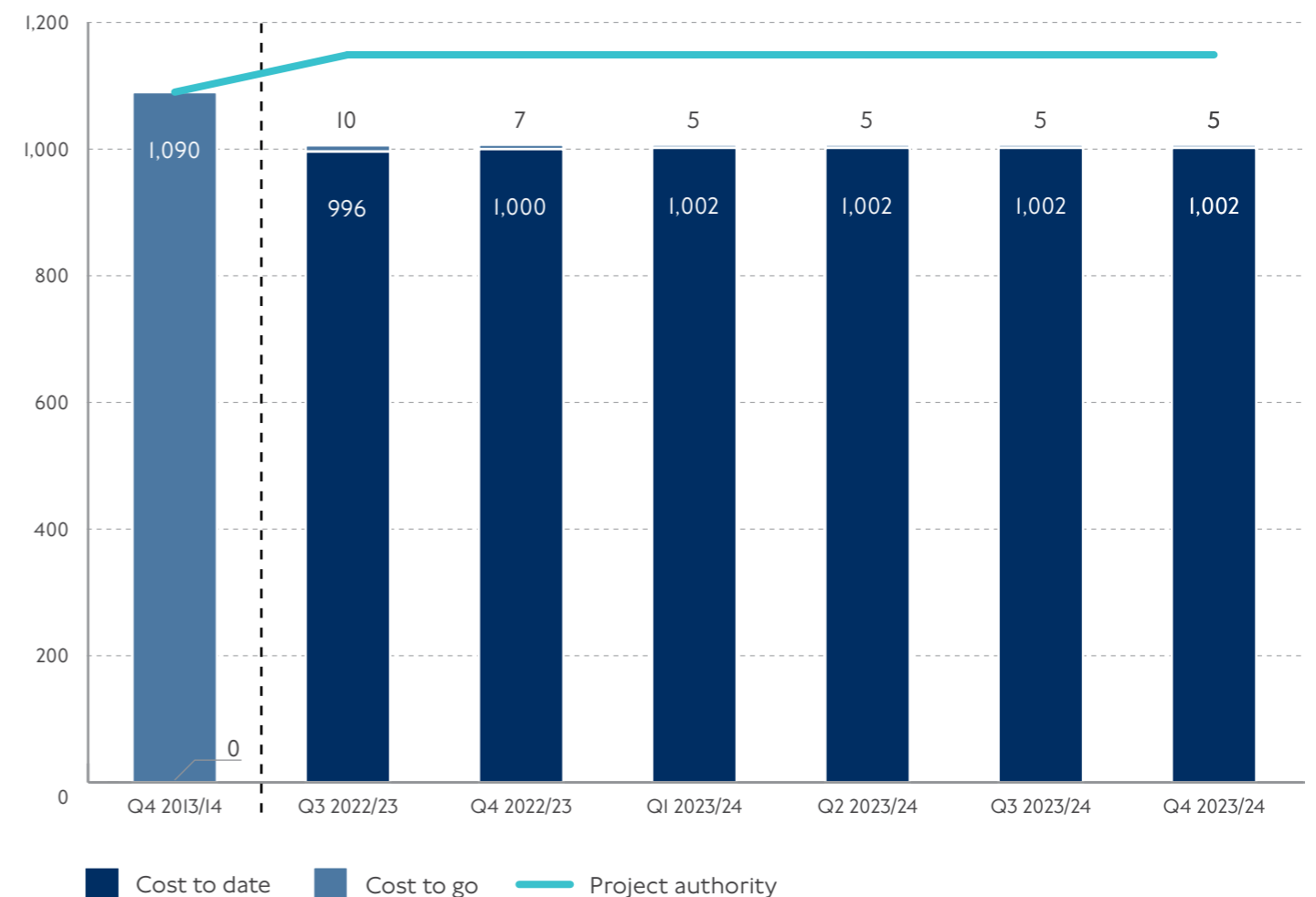
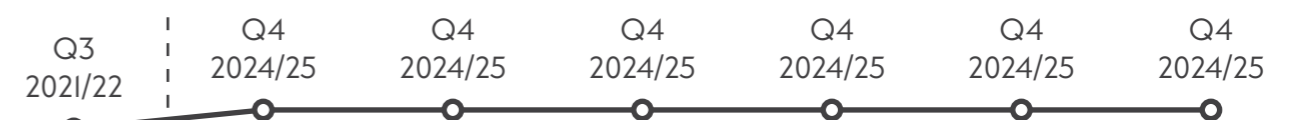
Since 21 May 2023, the Class 345 fleet has been operating the peak service of 24 trains per hour, consistently meeting the required daily availability level of up to 65 trains.

The train and signalling manufacturers continue with their programme of software upgrades to address residual reliability issues (with an appreciable improvement in Quarter 4)

This programme has been accounted for in the rolling stock project forecast through to 2025.

Estimated final cost performance over time (£m)

Forecast completion date



Line upgrades

Four Lines Modernisation

Forecast completion	Gross cost to date (£m)	Gross cost to go (£m)	Gross EFC (£m)	Programme and Project Authority (£m)	Variance: EFC versus authority (£m)
Q3 2025/26	5,363	163	5,526	5,520	(6)
Change since last Investment programme report					
No change	31	120	10	No change	

Financial commentary

In Quarter 4 2023/24, the estimated final cost (EFC) has increased by £10m. £7m of this results from a more detailed assessment of the changes to the prolonged signalling software schedule from our signalling supplier and Canadian dollar exchange rate impacts.

The remaining £3m results from updates to the latest inflation rate assumptions due to the delay, prolongation and revised profile of resources and spend. The inflation impacts both the signalling contract spend and our internal spend.

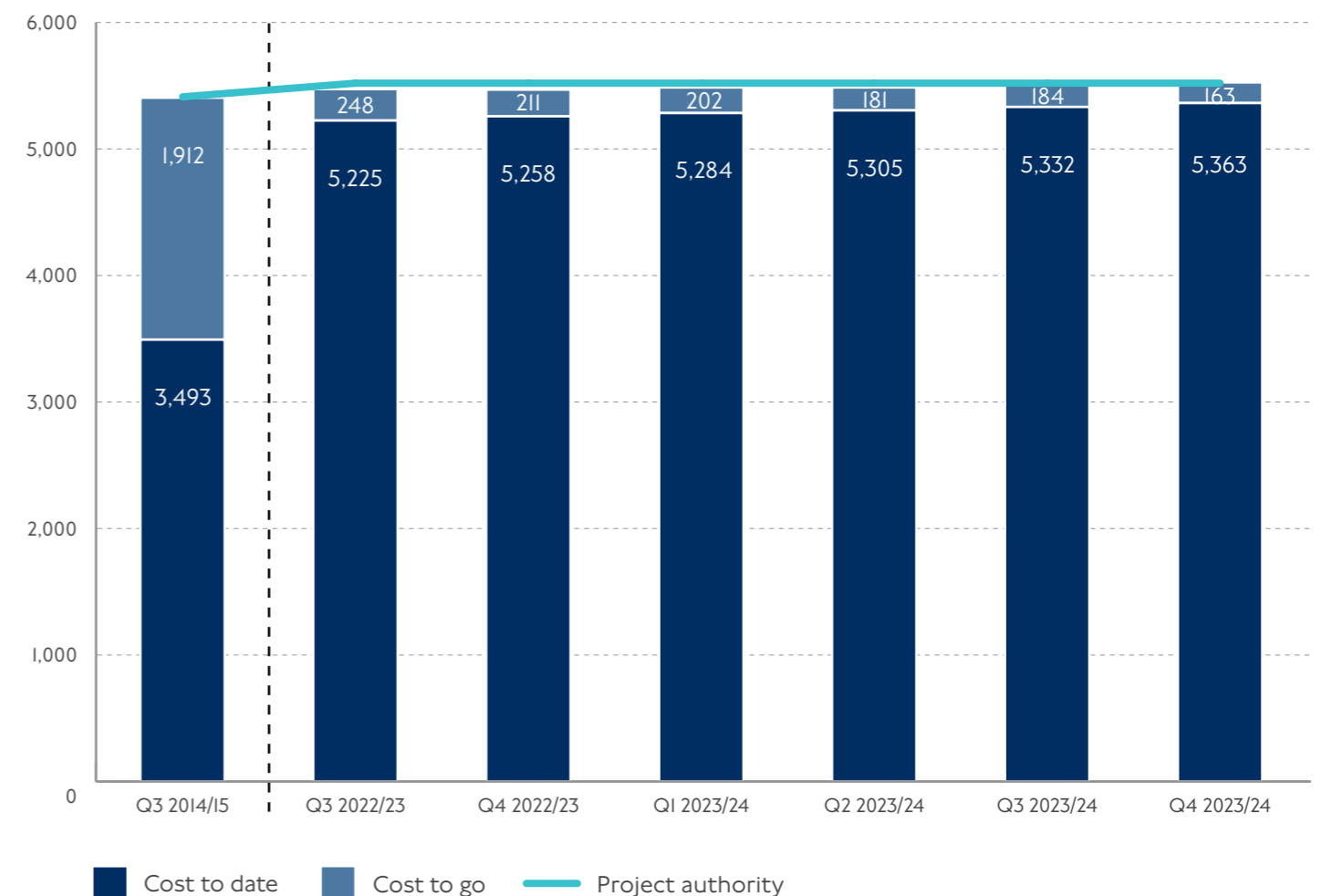
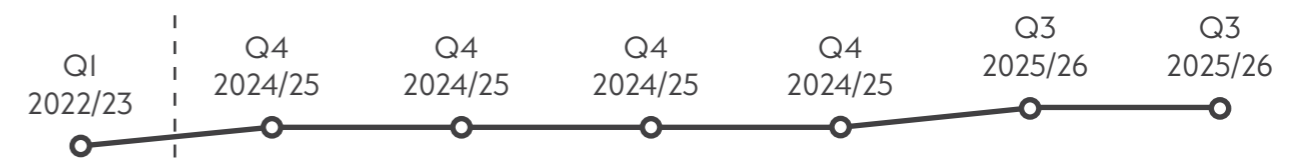
Four Lines Modernisation is a complex and challenging programme and remains under both schedule and cost pressure as we progress with the development and commissioning of the most complex areas.

We continue to explore a range of opportunities to mitigate these pressures where possible, including assessing the benefits of different delivery strategies.

A detailed update of the costs and schedule will be provided in the annual submission to the Programmes and Investment Committee in June 2024.

Estimated final cost performance over time (£m)

Forecast completion date



Performance over time commentary

The forecast completion date shows when the final signal migration area (SMA), will be brought into service. The date has been delayed from the initial forecast made when the signalling contract was awarded in 2015. This is principally owing to challenges with complex software development, testing and commissioning, closure availability and, to a slightly lesser extent, the pandemic.

Following the further maturing of software development for the next signalling migration area to go live (SMA8) and our matured understanding of the interdependencies with operational readiness, we are now targeting SMA8 go-live early in Quarter 4 2024/25. This will have a knock-on impact on the programme critical path and will see a delay in completing the overall project. This programme slippage and the associated mitigations are currently under analysis, the outcome of which will be reported in the annual submission to the Programmes and Investment Committee in June 2024.

Programme update

The programme is delivered by progressively installing new signalling on sections of the railway known as signal migration areas (SMAs). The new automated signalling system is already in place at 62 stations, including the whole of the Circle and Hammersmith & City lines, as well as the east end of the District line.

The remaining areas still to go live with the new signalling system include the Metropolitan line north of Finchley Road (SMAs 8, 9, 13 and 14) and the boundaries of the commissioned areas with the west end of the District line (SMA 10/12 Boundary Moves).

SMAs 8 and 9 (Neasden and Harrow) are the most complex areas in the programme and present significant challenges associated with the integration of the new signalling system with the Jubilee line and Neasden depot train control software, along with the management of manually driven Chiltern trains, restricted access opportunities and significant operational training requirements.

Significant progress has been made for these areas with development of the software and several successful site system testing sessions. This has increased our confidence in the maturity of the software for go-live and enabled a better understanding of the challenges of these technically complex areas and therefore the schedule to complete.

From 13 to 14 April 2024, we completed further system testing in the SMA 8 area during a weekend closure, with more testing planned for July 2024. This is a step forward in reducing risk towards achieving our planned commissioning milestone for this area in Quarter 4 2024/25.

We continue to make positive progress in maturing the software development for SMA9 (which includes the integration of manually driven Chiltern trains with the new signalling system) ahead of our third system test planned later this year.

Installation of trackside signalling assets in the areas that are yet to go live is now substantially completed (a very small number of assets remain outstanding as they require a more complex installation method, these assets are due to be completed by the end of 2024).

Works are progressing on the planned upgrades to the heavy lifting shed at Neasden depot. The detailed design for the new staff accommodation block is planned to be completed in Quarter 2 2024/25 and will include a number of sustainable technologies to minimise operational carbon and environmental impact, including a solar panel system (with any excess electricity feeding back into the London Underground supply network), LED lighting and a new efficient intelligent heating and cooling system. Once built, these facilities will enable the planned overhaul of Metropolitan line trains.

Line upgrades

DLR rolling stock and systems integration

Forecast completion	Gross cost to date (£m)	Gross cost to go (£m)	Gross EFC (£m)	Programme and Project Authority (£m)	Variance: EFC versus authority (£m)
Q3 2027/28	540	402	942	881	(61)
Change since last Investment programme report					
3 quarters later	77	(42)	35	No change	

Financial commentary

There has been a significant EFC increase to the programme, as a result of the insolvency of the principal contractor delivering infrastructure works at Beckton in Quarter 2 2023/24, and the reassessment of the likely outturn cost of all remaining works across the entire programme, including estimates for unprocured scope and future inflationary allowances. We continue to review options to mitigate these cost pressures where possible and will provide a further update to the Programmes and Investment Committee in October 2024 and, if required, seek additional Programme and Project Authority.

Performance over time commentary

Since Programme and Project Authority was granted in 2019, we have received approval from the Government to purchase II additional trains funded through the Housing Infrastructure Fund (HIF).

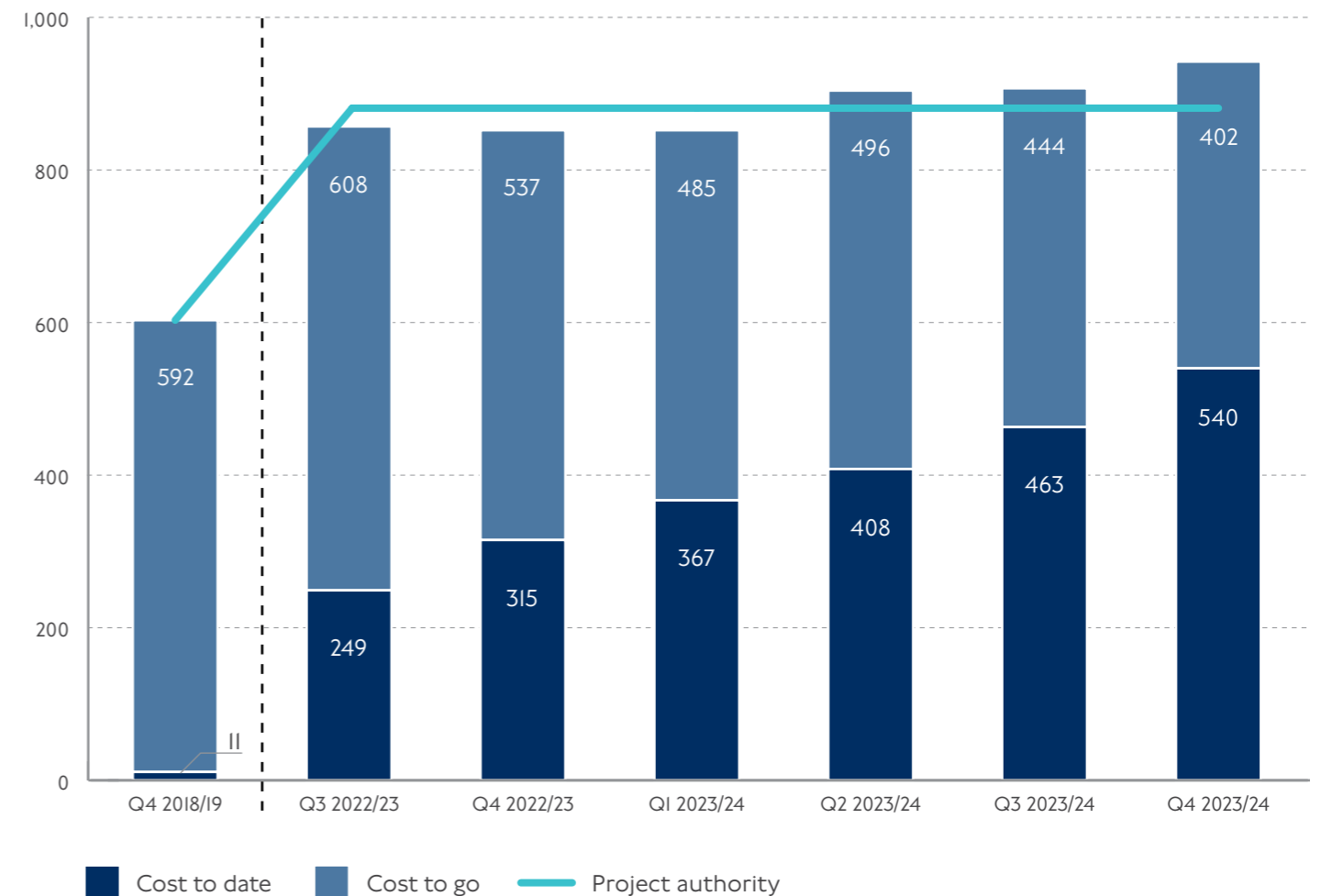
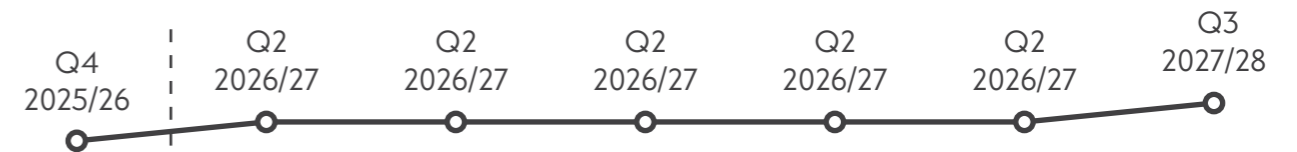
The increase in EFC from Quarter 4 2018/2019 reflects the additional scope associated with the £261m of grant funding from the Government to deliver the HIF scope of works.

The EFC in Quarter 4 2023/24 reflects a reappraisal of the initial estimates of the impact of the insolvency of the principal contractor delivering infrastructure works at Beckton depot and the reassessment of the likely outturn cost of all remaining works across the entire programme, including estimates for unprocured scope and future inflationary allowances. This has resulted in a higher range than our initial estimates and a higher mid-point, which is reflected in the current forecast.

The planned completion date is now based on incorporation of the HIF-funded works to the schedule.

Estimated final cost performance over time (£m)

Forecast completion date



Rolling stock delivery

Manufacture of the new rolling stock in Spain continues to programme, with 30 of the 54 trains completed.

As stated in the Quarter 3 investment programmes report to the Programmes and Investment Committee, we encountered some challenges during integration testing works towards the end of 2023 which has had an impact on when the first train can enter service. Testing has begun again, and we now expect the new trains to begin to enter into passenger service in Quarter 2 2024/25. Importantly, the end date for the renewal of the full fleet remains unchanged for Quarter 2 2026/27.

Beckton depot and network infrastructure

Following Buckingham Group, the principal contractor for the Beckton depot northern sidings contract, entering administration, we are implementing alternative arrangements to ensure the completion of these works. Works have now restarted on site with Morgan Sindall, our southern sidings contractor, and we anticipate bringing the northern sidings into use in Quarter 2 2024/25.

Works are progressing in parallel on the southern sidings and we anticipate bringing these into service shortly after the northern sidings in Quarter 2 2024/25. The invitation to tender for the design and build contract for the new southern expansion, funded through the HIF, has been issued.

Construction has started on a second entrance at Blackwall station, with piling works now complete. Power resilience works have been completed on three of four routes on the DLR network.

Carbon reduction

The following carbon reduction initiatives have been undertaken:

New train acceleration modification software

Initiative: Modifying new train acceleration enables reduction of planned power upgrades and reduces energy consumption, leading to significant carbon and cost savings.

Carbon saving: 4.057 tonnes of carbon dioxide emissions over the new train lifecycle. Average 130 tonnes of carbon dioxide emissions annually.

Reuse of excavated material

Initiative: All site-won material is proactively assessed for reuse at Beckton depot. So far, 3,605 cubic metres of concrete have been crushed and reused.

Carbon saving: 990 tonnes of carbon dioxide emissions to date.

Modular substation

Initiative: For Beckton depot's substation, the team opted for a modular design as opposed to a standard construction method, saving on transport and construction carbon.

Carbon saving: 107 tonnes of carbon dioxide emissions.

HVO fuel

Initiative: Use of hydrotreated vegetable oil as a fuel product for onsite generators.

Carbon saving: 127 tonnes of carbon dioxide emissions to date.

Solar panels on depot maintenance buildings

Initiative: Maintenance facility building design features 400 roof-mounted PV panels with 104,000 kWh annual energy generation.

Carbon saving: 124 cubic tonnes of carbon dioxide over a 30-year operating lifecycle.

Temporary fit-out shed

Initiative: Temporary building was planned to accommodate trains while other depot works were complete. Solution was found by incorporating assembly of trains into existing buildings.

One-off carbon saving: 1,200 tonnes of carbon dioxide emissions.

Beckton depot expansion

Initiative: Reduced the number of planned depot sidings from 28 to 17, validated through systems performance engineers.

Carbon saving: 2,345 tonnes of carbon dioxide emissions between now and when the project is expected to be completed in 2026/27.

A total of 9,980 tonnes of carbon dioxide emissions have been reduced across the Rolling stock replacement programme's whole life cycle, a carbon equivalent of powering TfL head offices for three years.

Line upgrades

Piccadilly line upgrade

Forecast completion*	Gross cost to date (£m)	Gross cost to go (£m)	Gross EFC (£m)	Programme and Project Authority (£m)	Variance: EFC versus authority (£m)
Q4 2026/27	1,101	1,955	3,056	2,994	(62)
Change since last Investment programme report					
No change	152	(146)	6	No change	

Financial commentary

In Quarter 4 2023/24, the EFC increased by £6m to £3,056m, which exceeds the current Programme and Project Authority of £2,994m. This increase largely reflects the outcome of negotiations with Siemens Mobility Limited in December 2023 to reschedule new train deliveries to better align with depot and infrastructure availability and revise the payment profile.

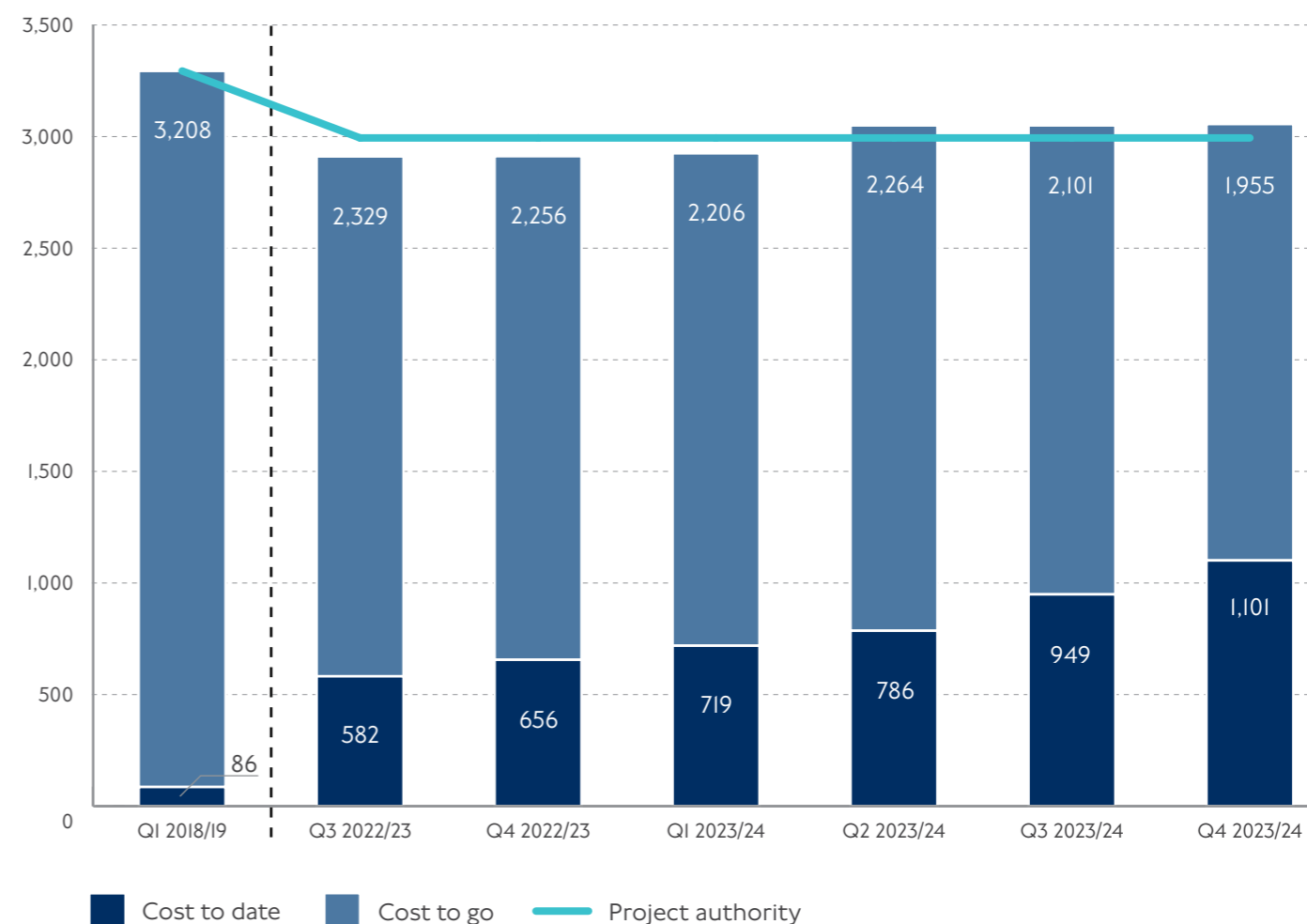
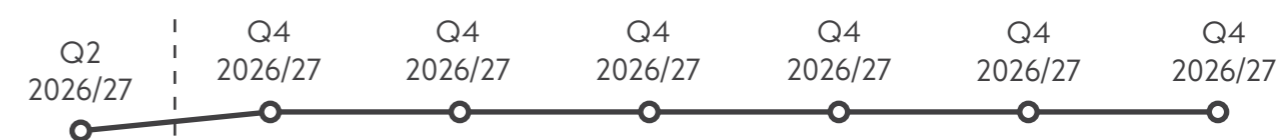
The underlying increase has been partially offset by opportunities identified during a detailed review of the EFC in Q4. A revised schedule has been agreed for completing delivery of the new rolling stock which better aligns with the scheduled availability of line-wide infrastructure and depot facilities.

These actions mean that the first train will still arrive in London for testing in late summer 2024 and is planned to be introduced into service in 2025. The programme remains challenging but on target for achievement of the key output of a peak service frequency uplift to 27 trains per hour during 2027.

Significant work has been completed to grow the pipeline of opportunities to reduce costs. With this increase in opportunities, we now have a plan in place to lower the EFC back to the existing Programme and Project Authority.

Estimated final cost performance over time (£m)

Forecast completion date



* The forecast completion date reflects the achievement of all sponsor key benefits for the programme: (1) first train into passenger service; (2) train replacement is complete, and (3) the timetable is increased to 27 trains per hour.

Performance over time commentary

As reported to the Programmes and Investment Committee on 5 October 2023, schedule and EFC have been under pressure from several factors, including increases in base costs due to emerging scope in the depot upgrades, industry price increases and indexation. Programme risk and uncertainty provisions have also been increased to reflect schedule risks and the associated impacts. Despite this, our planned completion date has remained stable.

We continue to progress actions to realise the range of programme-wide opportunities identified, to reduce pressure on the programme EFC, including the revised delivery approach for the depot upgrades and improved risk management.

Programme update

The revised profile for train delivery has been incorporated into the schedule for the programme.

We remain on track to receive the first new train in late summer 2024 and to begin system integration testing on the Piccadilly line shortly after its arrival. The first train into passenger service remains on track for 2025.

As previously reported, the revised delivery profile enables 80 per cent of the new Piccadilly line trains to be assembled in the UK, at Siemens' manufacturing facility in Goole, Yorkshire (previously 50 per cent).

Good progress has been made on enabling works to ensure the existing railway infrastructure will be ready to support the testing of the new train later this year.

Significant work has been completed to establish a plan for reduction in EFC for the programme. We are working with our supply chain partners to drive innovation, identify opportunities to further reduce delivery costs, and create value engineered solutions in key areas, with the aim of driving the EFC down within the current Programme and Project Authority for the programme.

New trains

The new higher-capacity Siemens trains will be accessible and feature walk-through interiors, saloon air-conditioning (for the first time on a Deep Tube train) and all-double doorways to improve boarding and alighting. Modern audio/visual communication systems will include digital display screens for live customer information and advertising, a new CCTV system for the train operator to view the platform-to-train interface from the driving cab, and improved customer security cameras.

The manufacturing contract with Siemens is progressing well, with the first two fully assembled trains now at Siemens' test and validation centre in Westphalia, Germany.

The new trains are undergoing a comprehensive programme of pre-delivery performance and reliability proving trials prior to series production. This has included climatic chamber testing to evaluate the performance of on-board systems under extreme temperature conditions, vehicle sway characteristics and crush-loaded traction and braking performance tests.

Results to date have been very positive, with performance of the new train fully matching technical specification requirements and performance expectations.

The rephasing of the train delivery schedule and timing of payments agreed under the contract with Siemens has not affected the delivery of the first test train to London, which remains on target for summer 2024 for testing on the network. The revised schedule means that up to 80 per cent of the new trains will now be built in the UK at Siemens' factory in Goole, Yorkshire, surpassing the 50 per cent target originally planned. Siemens is investing up to £200 million, creating up to 700 jobs at the Goole factory and 1,700 new jobs in the supply chain.

The Piccadilly line upgrade is a key contributor to TfL's Green strategy and the ambitions and targets of the Mayor's Transport Strategy, the London environment strategy and TfL's Corporate environment plan. The withdrawal of the legacy 1973 Tube stock fleet and introduction of new energy-efficient 24 Tube stock trains will enable the progressive introduction of regenerative braking on the Piccadilly line, which will reduce annual traction energy consumption by 20 per cent.

Infrastructure is being designed to minimise whole-life carbon and the Piccadilly line upgrade carbon baseline is being updated to reflect the current delivery strategy.

Enabling works

Infrastructure enabling works are progressing in line with the revised delivery strategy, which supports systems integration testing with the new trains and facilitates earliest arrival of new trains at Cockfosters depot for maintenance familiarisation and staff training. This includes infrastructure gauging works to enable new train operation.

Good progress is being made with the new platform to train one-person operation closed circuit TV system, with successful software testing at Siemens facility in Germany.

New platform stopping markers are being installed for the new trains at all stations across the Piccadilly line.

Work is progressing on high voltage power supply upgrades at Northfields and Cockfosters to support the increased power loads at the train maintenance depots.

Depots

Modifications are underway within existing depots to provide initial maintenance facilities for the first new trains.

The construction of three new stabling and reversing sidings at Northfields is substantially complete with final commissioning planned for October 2024.

At Cockfosters depot, site preparation and enabling works are underway for the new wheel-lathe facility and a contract has been awarded for building construction.

The first of two new cab simulators is being commissioned in readiness for the start of train operator training and arrangements are being finalised for installation.

Good progress continues to be made on the design and delivery planning for the end-state depot facilities, with input from the contractors engaged to provide early contractor involvement, which aims to reduce the schedule and cost to complete both depots.

Network extensions

Silvertown Tunnel

Forecast completion	Net cost to date (£m)	Net cost to go (£m)	Net EFC (£m)	Programme and Project Authority (£m)	Variance: EFC versus authority (£m)
Q4 2024/25	125	55	180	176	(4)
Change since last Investment programme report					
No change	6	(6)	No change	No change	

Financial commentary

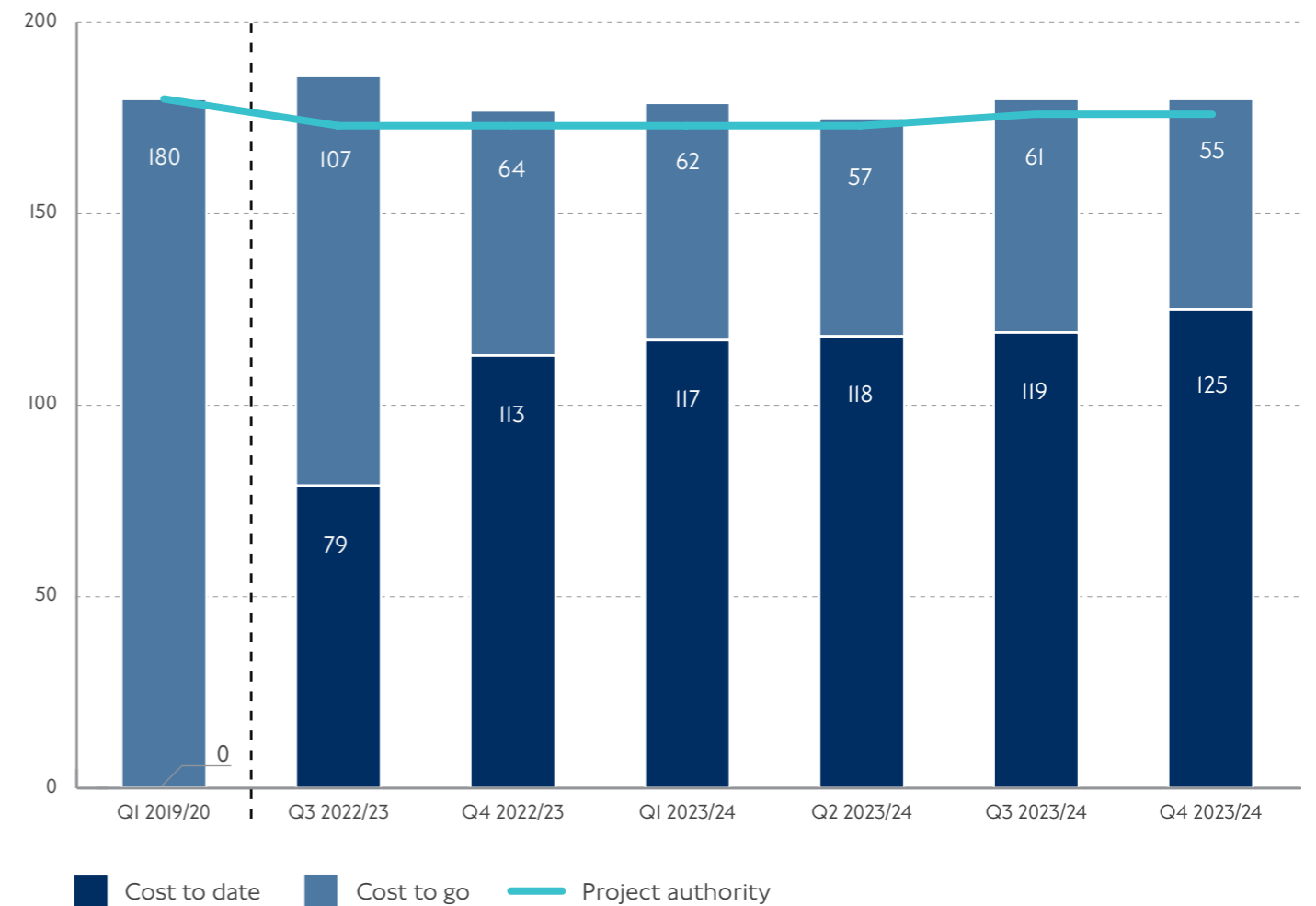
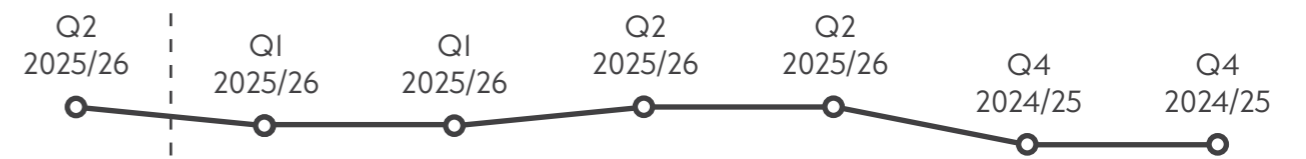
The EFC is currently £4m over Programme and Project Authority due to COVID Safe Stop and inflation. The project team continue to look for ways to bring the EFC back in line. The forecast permit-to-use date remains in Quarter 4 2024/25.

Performance over time commentary

The forecast end date is when the permit from an independent assessor to use the new Silvertown Tunnel is obtained. Forecast permit to use remains in Quarter 4 2024/25.

Estimated final cost performance over time (£m)

Forecast completion date



All the figures in the financial table above are shown as inclusive of income and third-party contributions.

Programme update

At Silvertown, construction of the permanent wall to the tunnel portal approach is progressing well. Construction of the tunnel domes in the area that was previously excavated has been completed and backfilling has begun. At Greenwich, similar work has started to allow waterproofing of the tunnel domes prior to backfilling.

Another milestone was reached in the quarter with the completion of cable tray installation throughout the entire 1.1km stretch of tunnels and cross passages. Cable pulling has now started within the tunnel, including the first tranche for lighting. Approximately 75km of electrical cable will be fitted during the next quarter.

Works have progressed well at the A102 road, following several productive weekend closures of the Blackwall Tunnel. This includes installation of gantries across the carriageway, construction of a new overbridge and resurfacing, negating the need for proposed contingency weekends.

Up to the end of March 2024, a cumulative total of 2,322,030 tonnes of materials and waste have arrived or left the site, of which 1,678,529 tonnes were delivered or left the site via river transport. By using an average of 17 tonnes per vehicle journey, approximately 98,736 heavy goods vehicle movements were taken off the road.

Works continue with the bus service operator (Go-Ahead London) to develop a programme for procurement of the required electric vehicles. The network includes routes I08 (the existing service using Blackwall Tunnel), I29 and SL4, which forms part of the wider Superloop network.

The I29 and SL4 will begin operating when the Silvertown Tunnel opens in 2025. We will be working to deliver a zero-emission bus fleet across all three routes by the time the tunnel opens, including the accommodation of electric double-deck vehicles.



New Superloop bus routes will operate when the tunnel opens

Network extensions

Bank station capacity upgrade

Forecast completion	Gross cost to date (£m)	Gross cost to go (£m)	Gross EFC (£m)	Programme and Project Authority (£m)	Variance: EFC versus authority (£m)
Q4 2025/26	694	10	704	702	(2)
Change since last Investment programme report					
No change	(1)	1	No change	No change	

Financial commentary

Since the last investment programme report, we have been able to reduce the EFC and risk position following final account settlement with the main contractor, Dragados (approximately £0.5m, rounding prevents display on table). Despite these reductions, the project's EFC remains above the existing Programme and Project Authority.

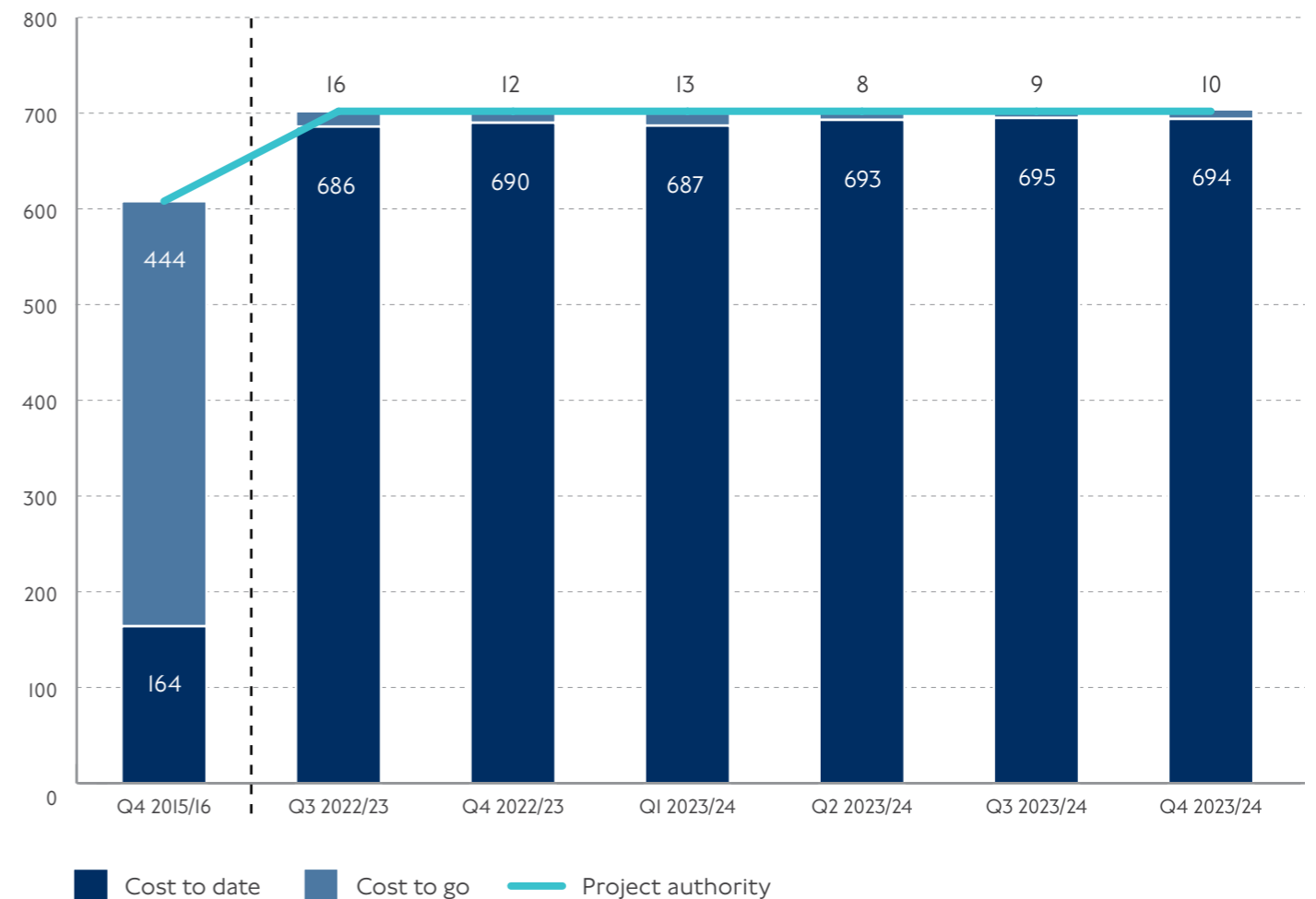
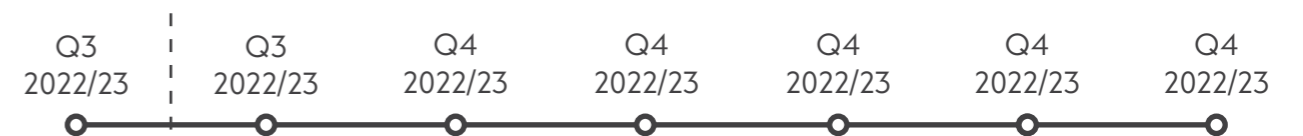
All opportunities for reductions to the EFC are being closely monitored. However, given the greater certainty of the project's schedule and costs to go, to ensure the project does not exceed Project and Programme Authority, a paper is being drafted to seek additional authority from the Programmes and Investment Committee meeting in June.

Performance over time commentary

Our estimated final cost has increased since the Programme and Project Authority award in 2016. This is due to site works being disrupted by the impact of the terrorist attack at London Bridge, the need for additional scope following the discovery of asbestos, and the impact of the pandemic. Over the last six quarters, our estimated final cost has remained static.

Estimated final cost performance over time (£m)

Forecast completion date





Work at Bank station has improved the experience for customers

Programme update

This complex project has increased the station's capacity by approximately 40 per cent, improved passenger flows and reduced journey times, enhancing the overall customer experience. Improvements include step-free access to and from the Northern line, improved access to and from DLR platforms, two new moving walkways, 12 new escalators and two new lifts. There are also more direct routes within the station and a new entrance on Cannon Street.

Since opening the new Cannon Street entrance last year, the project has focused on closing out final snagging works, together with the assurance activities needed in order to hand the new and revised assets into maintenance.

For a complex project of this nature and longevity, this takes time to ensure comprehensive and accurate information is captured, together with ensuring our suppliers deliver on their obligations.

In addition to the station works close-out, there are a number of external works to complete, largely associated with junction upgrades and highway reinstatements. A new signalled pedestrian crossing has recently been commissioned on Cannon Street, and works are in the detailed planning stage for modifications to the Upper Thames Street–Arthur Street junction. Added to this are the ongoing negotiations with the City of London (the City) regarding backfilling our access shaft in Arthur Street.

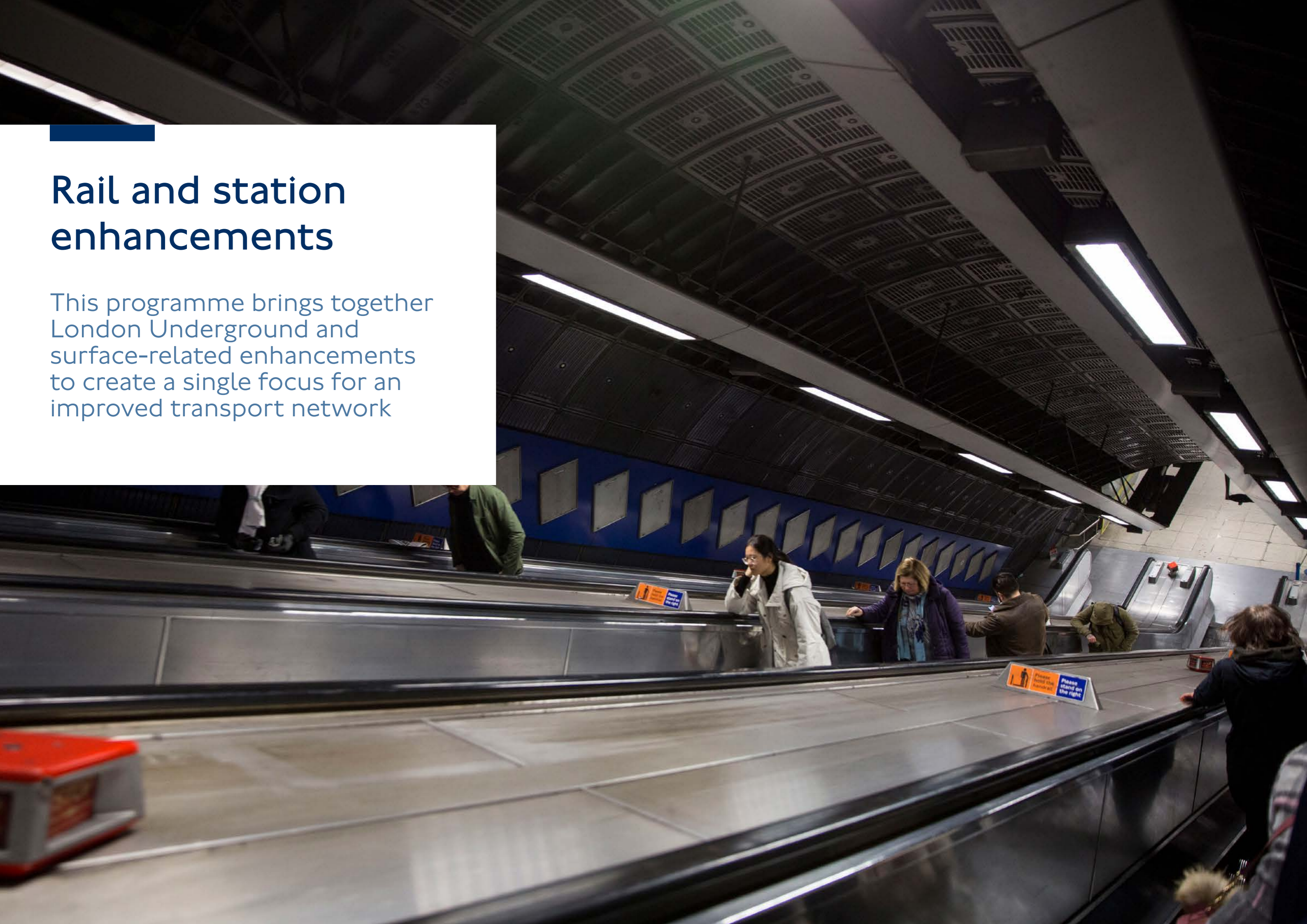
Directly contributing to close-out is settlement of the final account with Dragados, meaning we now have a better element of cost certainty. This in turn is providing a clearer picture in terms of Programme and Project Authority, and the project is preparing a paper for the Programmes and Investment Committee in June 2024 to ensure authority is increased sufficiently.

Works to complete snagging and assurance are ongoing and subject to weekly scrutiny. Risks are reviewed on a regular basis and updated where necessary. Detailed logistical planning is underway for the remaining junction works, combined with planning for the backfill of the Arthur Street shaft once the lease between TfL and the City is in place.

Other progress has seen the team successfully navigating the complex pipe subway technical challenges to the gas extract system and are now in the process of final snagging prior to re-opening of the section of the station known as the bullring. Assurance is now focused on those few asset areas currently outstanding, for example those relating to fire prevention and management.

Rail and station enhancements

This programme brings together London Underground and surface-related enhancements to create a single focus for an improved transport network



Rail and station enhancements

Forecast period	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost (£m)	Programme and Project Authority (£m)	Variance: Forecast cost v authority (£m)
2022/23 to 2025/26	133	182	315	1,036	721

Change since last Investment programme report				
No change	35	(42)	7	9

Financial commentary

An additional £9.5m of Programme and Project Authority was approved at the February 2024 meeting of the Programmes and Investment Committee for step-free access projects funded from the Sustainable Housing and Accessibility Fund. The approval will enable the delivery of step-free access at Northolt in 2026, as well as concept designs for capacity upgrades and step-free access at North Acton and West Hampstead by spring 2025.

The Programme and Project Authority of £1,036.2m also reflects spend outside of the review period, prior to 2022/23 and beyond 2026/27.

The forecast between 2022/23 and 2025/26 has reduced by £7m. The reduction is predominantly driven by £2.8m efficiency target allocated against the forecasted spend in financial year 2024/25, which will be actively monitored against value engineered delivery, in addition to the reprofile of spend into later years, including the Royal Docks Programme, due to availability of funding.

The reduction is offset by the transfer of funding into the step-free access programme of £4.3m (Northolt £3m and West Hampstead and North Acton £1.3m) for delivery in financial year 2024/25.

Performance over time commentary

The total cost shows little movement from the previous quarter but there has been good progress in converting the £35m of cost to go into spend to date when compared with Quarter 3. Some delays have resulted in delivery moving into financial year 2024/25 and later years. Increased authority recognises the longer-term forecast for the programme.

High Speed 2

The Government's Network North announcement in October 2023 significantly scaled back the project north of Birmingham and has led to a review of Euston station design and funding arrangements. In December 2023 the Government issued the Station Design Authority letter to HS2 concerning Euston, and we have continued to engage collaboratively with them and other Euston

Partnership members including Network Rail, Department for Transport (DfT) and Lendlease, the masterplan development partner, in understanding the impacts of this change on us, our operations, passengers and London.

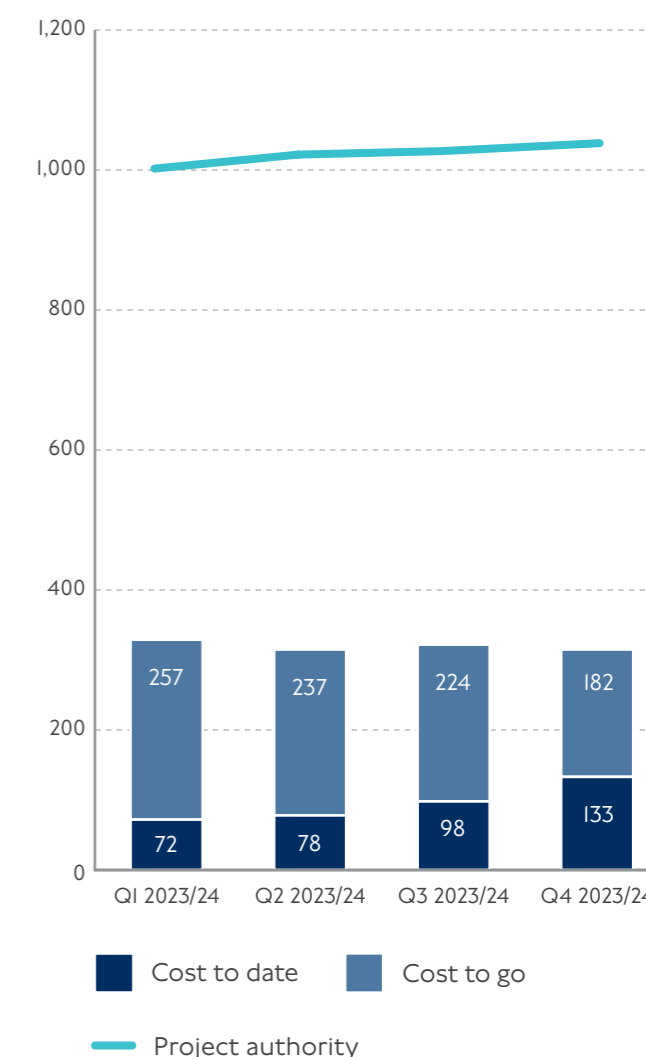
We are continuing to work with HS2 Ltd and partners on options to reduce costs while ensuring effective functionality of our infrastructure and operations, such as the London Underground and bus stations at Euston.

Environmental requirements and carbon reduction targets for new or altered assets have been incorporated into the functional requirements and have been cascaded to the HS2 Ltd supply chain.

With the link from Old Oak Common to Euston now delayed and concerns relating to the funding and timing of the tunnels from Old Oak Common to Euston, Old Oak Common will become a temporary terminus for HS2 services for up to a decade. We have made the case to the Government to procure additional Class 345 Elizabeth line trains to ensure sufficient capacity for passengers coming from HS2 services to continue their journey into central London.

There has been some progress in relation to the provision of level boarding for Elizabeth line rolling stock at Old Oak Common, with the DfT providing support for HS2 to undertake feasibility design work to investigate the lowering of tracks. We continue to actively engage with HS2 Ltd and Network Rail on this proposal.

Rail and station enhancements performance over time (£m)



Elephant & Castle

A new station entrance and Northern line ticket hall will support the creation of 5,000 new homes and 10,000 new jobs in the area around Elephant & Castle station. This new entrance will significantly increase the station's capacity to meet both existing and new demand for Tube services, as well as delivering vital step-free access to the Northern line platforms.

Procurement arrangements for the new passenger connecting tunnels between the new station box and the existing Northern line platforms continues to plan in readiness for award later in July this year. Environmental requirements have been incorporated into tunnelling package contract documents and the contract is planned to be awarded in Quarter 2 2024/25. As a precursor to the main tunnelling works, the pre-tunnelling ancillary works made excellent progress and works on site were completed in February 2024. These works allow the main contractor to focus on tunnelling activities, without the added complications of relocating services or needing to strengthen existing platforms.

All these works, plus the station box, are known as Stage 1 works and are fully third-party funded. Construction of the station box continues, with excavation to deep basement levels making progress. The developer is planning to hand over the station box by Quarter 1 2025/26, as agreed.

Options have matured for the fit-out of the station box and tunnels, including bringing the new station entrance into use (known as Stage 2). Furthermore, Stage 2 was included in our business plan, approved by the TfL Board on 22 December 2023.

Battersea Power Station western entrance

The Battersea Power Station western entrance project will fit out a second entrance to Battersea Power Station, including providing additional step-free access.

Since 2022, funding has been secured and a funding and development agreement between us and Battersea Power Station Development Company has been entered into to facilitate the delivery of the Western entrance project, including an integrated construction and design team. Most recently, the project has completed the enabling works phase and is currently preparing for the start of the installation of escalators at the end of June 2024.

East London line enhancement programme

We are making a series of improvements to the East London line on London Overground, enabling us to increase train frequencies and support growth and regeneration in the local area. These works are fully third-party funded.

Surrey Quays station upgrade

Our upgrades to Surrey Quays station are progressing well, with piling works on platform two now complete and installation of drainage and the platform super-structure underway. On platform 1, the installation of the platform super-structure began over the Easter period. Construction works are progressing safely under interim Network Rail assurance governance as we finalise technical design elements.

We will bring the platform 1 temporary secondary means of escape into service in August 2024 to support the installation of the overbridge linking the two platforms. Works remain on track to complete in early 2026.

Power reinforcement

We have now formalised our implementation agreement with Network Rail to deliver required power reinforcement works on the Clapham Junction branch (which is managed by Network Rail).

We will undertake the power works on our infrastructure during the planned Easter blockade and plan to commission the new infrastructure in late June 2024.

Signalling enhancements

As part of our signal upgrade works, we will relocate and commission line-side signals during the planned Easter blockade, enabling us to proceed with the extension of platforms at Surrey Quays Station. Signalling control design is underway and is due to be commissioned in early 2026.

Canada Water bus station

We are upgrading Canada Water bus station to increase capacity and improve staff and customer facilities. The bus station was closed on 4 March 2024 to enable construction works to begin. We completed these works and reopened the bus station to the public on in mid-April.

Tram replacement rolling stock

Our rolling stock replacement programme will replace the life-expired Bombardier CR4000 trams, which are experiencing declining reliability and have one of the lowest states of good repair across our fleets.

A standard selection questionnaire was issued to the market on 3 January 2024. Following this, there has been significant interest from rolling-stock manufacturers and responses were received in April to be considered for the main tender phase. Design development for the depot and power interventions are ongoing.

DLR Thames Wharf

Feasibility-level design and initial value engineering work has now concluded for a new station at Thames Wharf, in line with the revised masterplan for the Thameside West development. We are in discussions with the developer for the Thameside West residential development on progression of the station design for Thames Wharf.

DLR Royal Docks

The Royal Docks station programme, funded by the Greater London Authority (GLA), is aligned with the emerging aspirations of the Royal Docks and Beckton Riverside Opportunity Area Planning Framework. This framework aims to improve accessibility and reduce congestion to enable an additional 3,000 homes to be built in the area.

At present, the upgrade to Pontoon Dock station is the only live project within the programme. We are nearing completion of the concept design and are in the process of preparing a planning application to the London Borough of Newham for the station upgrade. The upgrade will provide new escalators to platform level and improve the urban realm beneath the station. We submitted a formal planning application on 28 March 2024 and are continuing to work with the GLA and other third parties to secure a full funding package for the delivery of the works.

London Underground

The London Underground enhancements and station developments project covers a range of improvements, mainly to stations and depots. We continue to improve stations by carrying out capacity upgrades and delivering projects that increase and improve accessibility and relieve congestion.

Throughout Quarter 4, we made good progress, notably progressing the fit-out phase on the new western entrance at Stratford, starting works on site at Colindale and completing feasibility and pre-construction verification exercises to support the emerging sustainable growth and step-free access projects.

Colindale

The scheme involves the reconstruction of the ticket hall building above the tracks to provide increased capacity, step-free access and enable the future redevelopment of our land for residential use.

The DfT approved the business case for the Colindale and Leyton projects in December 2023, which allowed the release of money for Colindale station from the Government's Levelling Up Fund and the letting of the primary construction contract.

The main site works are now underway, with the erection of a tower crane and the successful installation of 34 piles at track level and opportunity work during a productive 10-day track possession between Edgware and Golders Green in early April 2024, with the line reopening as planned on 12 April 2024.

Knightsbridge

The project is working to resolve power capacity issues to meet the requirement for a secondary power supply to the new lifts. Engagement with UK Power Networks (distribution network operator) continues, with early enabling works underway to provide a new substation. Additional scope has been identified to manage excessive heat being generated by operational equipment in the new customer-circulating area serving the lifts.

The project team is working closely with key stakeholders and partners to refine the associated delivery schedule before confirming a revised opening date for the new dedicated step-free entrance.

Leyton

The scheme involves the creation of a new ticket hall to provide increased capacity and step-free access by means of an overbridge and lifts. These works will support thousands of new homes being built in the area.

The DfT approved the business case for the Colindale and Leyton projects in December 2023, subject to confirmation of the final programme, costs and benefits of the project upon completion of detailed design.

The detailed design and pre-construction phase of the scheme is close to being finalised, with the construction contract due to be let in Quarter 2 2024/25. We continue to liaise closely with key stakeholders, including the London Borough of Waltham Forest.



We are working to deliver step-free access at eight stations

Paddington – Bakerloo line

We are working with a third-party developer to deliver a new step-free ticket hall at Paddington (Bakerloo line). Installation of cabling, services and finishes for the new ticket hall and step-free access areas continue, ahead of opening in late summer 2024.

South Kensington

We are working with Places for London and its joint venture partner, Native Land, on plans for an integrated redevelopment of the station and surrounding properties to secure much needed step-free access to the Circle and District line platforms, capacity improvements and sustainable income from our estate.

The works comprise two distinct but related scopes:

- South Kensington station upgrade to provide congestion relief and step-free access
- South Kensington adjacent station development, which will provide new homes, retail and office space working with a development partner

The station upgrade works were paused in 2019 to allow for progress of the adjacent station development planning submission and subsequent appeal. This was further impacted by our financial situation following the coronavirus pandemic. The outcome of the adjacent station development planning appeal was confirmed in December 2023, permitting the development.

Places for London is now working with Native Land to further establish costs and viability. Meanwhile, we are revalidating the project's requirements and scope and seeking opportunities to value engineer the design.

This design work will also explore an option to include the installation of lifts to serve the Piccadilly line platforms, which would then make the station fully step-free.

Step-free access

In February we announced we will deliver step-free access at Northolt station. The next step is to update the previous pre-pandemic design and construction approach. We intend to start construction in early 2025.

In summer 2023, we announced eight stations where we were carrying out studies on the feasibility of making them step-free. A single preferred option has been identified for the majority of the eight stations, and costs are being updated and build plans confirmed. We announced in February that funding was in place for two of these stations (West Hampstead and North Acton) to proceed into full design.

We plan to give an update on the remaining stations (Alperton, Arnos Grove, Eastcote, Finchley Road, Rayners Lane and White City) and on our study of the southern branch of the Northern line later this year.

We also continue to actively engage with local authorities, developers and businesses in an effort to explore the options available to introduce further step-free access to stations. Feasibility work at other stations could be progressed, should the right amount of investment be provided.

Stratford

Construction works continue to progress, delivering a new urban realm and new southwestern station entrance and ticket hall.

Work is being completed on transforming part of the operational parking area into a new urban area, along with completion of the new entrance and ticket hall. The project is forecast to bring the entrance into use towards the end of June 2024.

The project continues to liaise closely with the Network Rail project to deliver a new customer lift connecting the Jubilee line concourse to the western subway.

Waterloo – Elizabeth House

This work is currently paused at the request of the developer.

West Ham

We are working with a third-party developer, Berkeley Homes, to build a new ticket hall to serve the Twelve Trees Park housing development, comprising 3,847 units to be delivered in four phases. The main construction works associated with the new entrance started in summer 2022. However, the developer, Berkeley Homes, has experienced challenges with the design and with the supply chain. It is anticipated that the works associated with the station will restart on site later this year.

Safe and healthy streets

This programme brings together bus enhancement and healthy streets projects to create a single focus for investment in healthy streets and enhancements for bus users



Safe and healthy streets

Forecast period	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost (£m)	Programme and Project Authority (£m)	Variance: Forecast cost v authority (£m)
2022/23 to 2025/26	305	384	689	588	(101)
Change since last Investment programme report					
No change	61	(52)	9	No change	

Financial commentary

The programme has progressed in line with the funding settlement conditions agreed with government over the two-year period for 2022/23 and 2023/24 and we have continued to provide funding to London boroughs for investment in their streets. The total investment in Healthy Streets across both operating and capital expenditure, is an average of £150m per year net of income across our business plan 2022/23 to 2025/26.

Investment in Quarter 4 was £61m, bringing spend to date this year to £172m, after delivering efficiency savings and cost reductions of £8m. This compares to an annual budget of £180m with the underspend due to slower-than-expected remobilisation of internal and external resources and the need to coordinate our works with others such as the utilities companies and the London boroughs.

Forecast cost has increased by £9m, primarily in 2026, as projects have reviewed their delivery plans and schedules. We will continue to manage these cost movements to ensure we remain within our funding envelope.

Performance over time commentary

Following the government funding settlement and the TfL Board agreement of the 2023 Business Plan, programme investment has continued to accelerate each quarter. This includes continued investment and commitment to deliver the Walking and cycling, Bus and Vision Zero action plans.

Programme update

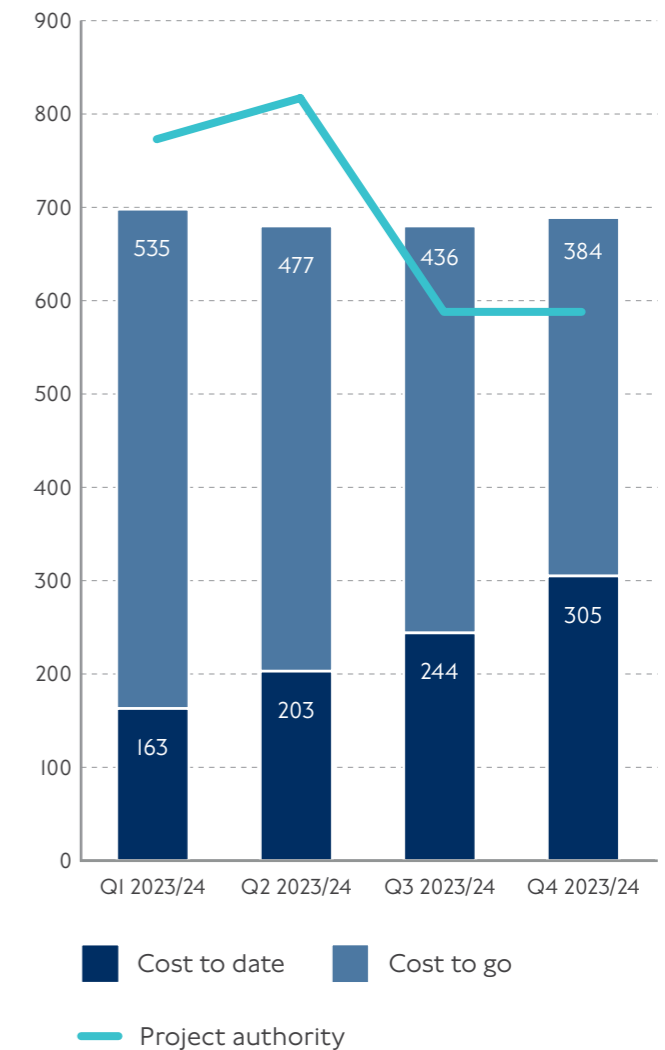
The programme continues to reduce road danger in line with the Mayor's Vision Zero strategy, as well as making it easier to walk, cycle and travel by bus across London. It will also accelerate progress towards mode shift, decarbonisation, economic recovery and tackling health inequalities.

The programme has delivered against targets for the year. London's cycleways network has quadrupled in length over the last eight years, with 68km delivered in 2022/23 and 2023/24, dramatically exceeding the target of 39km. This included a programme of delivery which capitalised on borough implementation of Low Traffic Neighbourhoods, through which cycleways could be designed on quiet roads, using wayfinding signs and road markings to make the main crossing safe and to connect communities to amenities and the wider cycleways network.

The Vision Zero target relating to lower speed limits was delivered early, with 20mph now in place on 265km of our road network against a May 2024 target of 220km. Bus lane totalling 10.06km has been delivered against a target of 10km, providing much-needed priority for some of the new Superloop routes, as well as supporting bus performance on other routes. Construction of a further 500m of new bus lane was completed in the first half of April 2024, bringing the current total to 10.56km.

Across TfL and the London boroughs, some post-pandemic mobilisation challenges persist – for example, in securing skilled project and engineering staff and coordinating works with a backlog of utility company road space requests for maintenance. Nonetheless, we remain world-leading in our approach to creating safe and healthy streets for London.

Safe and healthy streets performance over time (£m)





We continue to invest in our extending our Cycleways

Cycling infrastructure

Cycleway 4 London Bridge to Greenwich

The London Borough of Southwark completed their works to construct the temporary scheme for Lower Road between Rotherhithe roundabout and Surrey Quays Road on 4 March 2024, completing the final section of a protected cycling route between London Bridge and New Charlton. Snagging works are due to be completed in August 2024.

Cycleway 9 East Kensington Olympia to Brentford

The London Borough of Hounslow's works to deliver with-flow cycle tracks from Watermans Park to Brentford Magistrates' Court is progressing well and is due to complete in Q3 2024/25.

Cycleway 23 Lea Bridge to Dalston

Construction of segregated cycleways around Lea Bridge roundabout was completed on 26 January 2024, with snagging due to be completed in late July 2024. Construction of Lea Bridge Road started as planned on 24 July 2023 and is being delivered by the London Borough of Hackney.

Cycleway 50 Finsbury Park to Tottenham Hale

Construction of the section on our roads from Caledonian Road to Finsbury Park was completed on 8 January 2024, with snagging work completed in April 2024. Consultation and monitoring of the changes we have made began on 22 May, while the scheme is in operation under an experimental traffic order.

Vision Zero

Lowering speed limits

Lowering the speed of vehicles in London is key to reducing both the likelihood of a collision and the severity of the outcome. The second phase of the programme is complete, with a 20mph speed limit now in operation on 264km of our roads against the Vision Zero action plan progress report target of 220km.

This quarter, we lowered the speed limits on more than 30km of our roads, including new 20mph speed limits in Wandsworth, Merton, Sutton, Newham, Greenwich, Richmond and Hounslow, as well as a new 30mph speed limit on the A4 Bath Road in Hounslow.

Banners mounted on lamp columns will be installed across these corridors to help raise driver awareness of the new 20mph speed limit. A digital advertising campaign ran from 5 February to 15 March 2024 to complement the changes and raise customer awareness.

Work is underway to introduce a new 40mph speed limit on the A406 North Circular Road in Enfield and Waltham Forest, with detailed design nearing completion. This project will complete phase 2 of our Lowering speed limits programme and is expected to come into operation in early July 2024.

Outcome definition work is taking place to identify where complementary speed-reducing features such as green infrastructure, lane reallocation and raised crossing points can be installed to provide a self-enforcing speed limit where it has recently been introduced, in line with DfT guidance on setting speed limits.

Safer Junctions programme

Following the completion of the Holloway Road/Drayton Park safer junction scheme in March 2024, we have now made improvements at 45 of the 73 locations identified on our roads with some of the highest collision rates involving vulnerable road users.

Further design and survey work continues at pace on the Battersea Bridge safer junction project, with construction due to start in Quarter 3 2024/25, pending statutory approvals and coordination with other works on the network.

We are continuing with design and planning work on the remaining safer junctions and are committed to public engagement on potential changes to 10 further locations by the end of 2024. We completed engagement on designs for Seven Sisters Road/Woodberry Grove in February 2024 and intend to undertake public consultation on the Cannon Street/King William Street (Monument junction) and Hogarth roundabout by Quarter 2 2024/25.

Pedestrian safety

Design work continues on more than 40 schemes across London, at locations where there is an identified road safety concern.

Construction was completed in March 2024 at the junction of Grosvenor Place and Duke of Wellington Place in Westminster, introducing a new signalised pedestrian crossing near Hyde Park. Prior to implementation of the new crossing, pedestrians were only able to cross via a subway with stairs, which was inaccessible to those using wheelchairs.

Improvements to a pedestrian crossing on the A10 by Palatine Road in Hackney, and the construction of a new pedestrian crossing on busy Cavendish Road in Clapham were also completed in March 2024.

During 2024/25, we plan to deliver pedestrian safety improvements at a number of locations, including King's Cross, the A23 in Lambeth, Redcliffe Gardens in Kensington and Chelsea, and the A5 Edgware Road in Westminster.

Bus priority

We continue delivery of new bus lanes, working towards a target of 25km by the end of March 2025. In Quarter 4 we achieved our milestone to introduce 10km of new bus lanes on borough and our roads, delivering 10.56km by the second week of April (10.06km by end March).

Signal timing reviews have been completed at a total of 898 sites to provide additional priority for buses, well exceeding the target of 700 for the year. Two-thirds of buses in London approaching traffic signals either arrive on a green signal or receive some form of bus priority.

In 2024/25, more than £10m of funding has been allocated to London boroughs to deliver enhanced bus priority on their local road networks. As well as new bus lanes, this investment will deliver other bus priority features such as new bus gates, the removal of pinch-points and changes to the operating hours of bus lanes.

We have identified a suite of activities to improve bus priority across the nine recently launched Superloop routes. Improvements include traffic signal upgrades, new and improved bus lanes and removing pinch-points. In some locations, a holistic corridor-based investigation is being progressed to focus on end-to-end bus priority. Signal timing reviews have already been reprioritised to include Superloop corridors.

Transformational schemes

Catford town centre

We entered into an agreement with the London Borough of Lewisham in February 2024 and are working with them to support their ambition to create a greener town centre for Catford, ensuring it is a pleasant place to live, work and visit, and improve transport in the area.

The concept design is progressing well: we submitted a planning application for the scheme in December 2023 and made a compulsory purchase order for the land required in January 2024. A public inquiry will take place on 2 and 3 October 2024.

To fund this scheme, we are also applying for funding through the DfT's Major Road Network fund. The business case was considered at the DfT Roads Investment Committee on 22 May 2024, ahead of ministerial and HM Treasury review.

Lambeth Bridge

The detailed design is substantially complete and on track for completion by the end of June 2024. Traffic management plans are substantially advanced for both the advance works and for the main works on the bridge and junctions.

BT will undertake advance works on their assets from mid-June 2024 before the main works start early in September 2024. Our advance works to remove the northern roundabout will be done to facilitate the BT works, finishing in mid-June 2024.

Borough funding

Safer corridors and neighbourhoods (SC&N) is the largest of our Local Implementation Plan programmes that enables boroughs to deliver a holistic range of Healthy Streets measures across their borough. Over the course of the year, boroughs progressed and completed around 600 Healthy Streets schemes funded by the SC&N programme. These include walking, cycling, safety and bus priority schemes delivering a range of active travel benefits on borough roads. The core measures that have been introduced include new Low Traffic Neighbourhoods, School Streets, pedestrian crossings, junction safety improvements, 20mph limits, cycle parking, cycle training and bus stop accessibility upgrades.

Bus safety

As of early June 2024, there are more than 1,500 buses in the fleet that meet either the 2019 or 2021 Bus Safety Standard (depending on the point at which they entered service). This makes up 45 per cent of the bus fleet with ISA units. The first new vehicles that meet the new 2024 requirements are now entering the fleet, which include optimised front-end geometry and enhanced interior measures to protect passengers. Meanwhile, we continue to research and trial potential features for inclusion in the Standard in 2027 and beyond.

Working with our bus operators, vehicle manufacturers and their suppliers, we have now agreed retrofit works on more than 2,600 buses. This will involve installing key safety features on older vehicles that entered the fleet prior to the Bus Safety Standard coming into effect. These works will take place throughout 2024/25 and the upgrades include intelligent speed assistance, which automatically restricts bus speeds to local limits, and camera monitoring systems, which replace wing mirrors with high performance cameras to improve driver visibility and reduce blind spots.

Fatigue detection technology is also being fitted on 500 buses in a trial that is expected to provide reliable data on fatigue risk in bus operations: its overall extent and the number of events by route, time of day or roster, for example. Bus operator managers will conduct supportive interventions based on the analysis, with the results helping to establish which interventions work most effectively in addressing fatigue risk.

Bus customer action plan

We published our Bus action plan in March 2022, which outlines how we will build and broaden the appeal of the bus service. This includes delivering a step-change in customers' perceptions and experiences of bus travel, which can be achieved through offering better information and meeting expectations of a modern and comfortable experience at bus stops and on buses.

Following the success of our trial on Route 63, where we introduced a coordinated package of enhancements both to the vehicles and to the at-stop waiting experience, we have applied these customer features to a further 433 buses across 29 routes. This includes richer on-bus content displays with more detailed customer information, USB charging points, priority seat demarcation and enhanced lighting.

We have also improved the experience for customers waiting for their bus with the rollout of more than 300 new countdown signs at bus stops across the capital, with all boroughs benefitting from new live travel information signs at a variety of locations. We have also renewed more than 400 bus shelters.

In 2023 and early 2024 we also improved wayfinding information, to include points of interest on 6,900 bus shelters, and delivered enhanced bus signage at 14 multi-exit London Underground stations and 11 single-exit Elizabeth line stations, to support customers with interchanging and navigating the network.

We continued to deliver trials to address customer pain points, including an enhanced on-bus cleaning trial with one of the bus operators on three of their bus routes to improve the experience on board for passengers, as well as the use of QR codes for customers to access live bus arrivals information at 74 of the most-used bus stops, as a potential replacement service for live SMS bus arrivals.



We are introducing a range of features to improve bus safety

Environment

This programme comprises environmental projects and includes the new green project pipeline that is being developed



Environment

Forecast period	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost (£m)	Programme and Project Authority (£m)	Variance: Forecast cost v authority (£m)
2022/23 to 2025/26	384	245	629	1,025	396

Change since last Investment programme report					
No change	56	(4)	52	12	

Financial commentary

We invested a further £56m in our Environment programme during the quarter. This was mainly related to the London-wide ULEZ, but we are starting to see increased activity in the other projects, in line with assumptions.

The primary driver of the increased costs since last quarter is due to the expanded ULEZ scrappage scheme. Underlying spend for other projects has remained broadly stable. The Programme and Project Authority has been realigned to the programme over the review period to ensure the portfolio has sufficient authority to the end of 2025/26.

Performance over time commentary

A number of projects in the programme are in an early stage of development and costs have been subject to review as we mature the scope, understand the challenges and opportunities within. Such projects include Waste heat, Solar private wire and elements of our Buildings decarbonisation programme.

In addition, to deliver our full net zero ambitions we will need to explore additional funding sources, both internal and external.

London-wide ULEZ*

On 29 August 2023, the ULEZ was expanded to cover all London boroughs. A report published on 31 October 2023, showed that in the first month after expansion vehicle compliance in outer London increased by 10 percentage points – from 85 per cent when the Mayor announced the consultation for the proposed expansion in May 2022, to 95 per cent. In addition, the number of non-compliant vehicles seen driving in London on an average day had decreased by 77,000 compared to June 2023, a reduction of 45 per cent. A further update on the impacts of London-wide ULEZ in the Six-month report will be available in the coming weeks.

* This includes other road user charging schemes

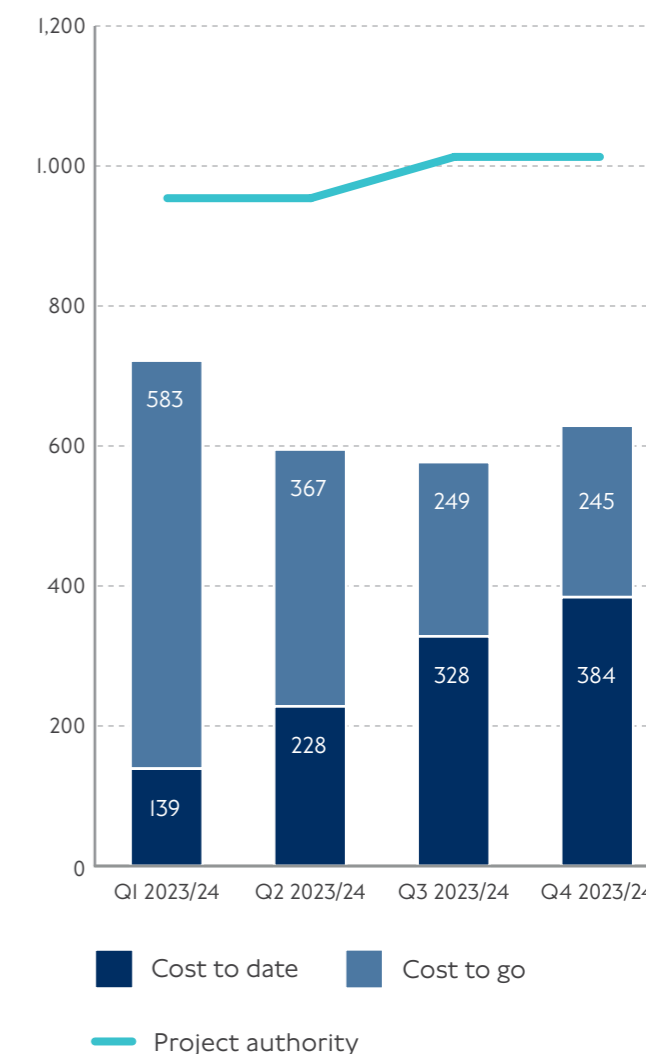
Since 30 January 2023, the largest vehicle scrappage and support scheme of its kind in the UK has been available to assist Londoners with vehicles that do not comply with the ULEZ emissions standards. Up to 3 March 2024, nearly 50,000 applications had been approved, which equates to almost £170 million of support committed for eligible Londoners.

In March 2024, the option to donate suitable vehicles to Ukraine was added to the scheme. A trusted intermediary, British Ukrainian Aid, will support the transfer of vehicles to Ukraine, which will be used for humanitarian purposes.

We have installed an extensive camera network to support the effective operation of the scheme. Up to 11 April 2024, we had more than 3,500 cameras enforcing road user charging schemes in London.

Unfortunately, vandalism of ULEZ cameras has continued in Quarter 4. All incidents are reported to the police. Several individuals have been arrested and charged, and one convicted. We are working closely with our contractors and the police. Where necessary, cameras are repaired or replaced.

Environment performance over time (£m)



Direct Vision Standard phase 2

Since March 2021, all heavy goods vehicles (HGVs) over 12 tonnes are required to obtain a safety permit to operate in London as part of the London HGV safety permit scheme. This scheme contributes to the Mayor's Vision Zero strategy by improving HGV drivers' visibility, thereby reducing the risks HGVs present to vulnerable road users. It is run in partnership with the boroughs through London Councils. Vehicles that do not meet the minimum one star on the Direct Vision Standard rating, introduced in 2019, are required to fit additional 'safe system' measures to the vehicle. Since March 2021, the scheme has been enforced by a penalty charge notice.

From 28 October 2024, HGVs will need to have at least a three-star rating for Direct Vision Standard or fit additional safety measures known as the progressive safe system (PSS), to operate in London. Between 8 January and 6 February 2024, a survey was conducted into the readiness of HGV operators to meet the 28 October star-rating go-live date. Feedback from this survey and subsequent industry engagement is being used to inform the update to London Councils on 20 June 2024, including a review of the proposed three-month grace period eligible operators can apply for to fit the PSS to their vehicles.

These changes will build on safety improvements from the current scheme which, using a baseline of 2017-2019 (averaged), has seen a 49 per cent reduction in the number of fatal collisions, and a 30 per cent decrease in serious collisions, involving an HGV and those who walk, cycle and motorcycle.

Electric vehicle infrastructure delivery

London is expected to need between 40,000 and 60,000 electric vehicle charging points by 2030, including up to 4,000 rapid chargers. Estimates show that a quarter of these could be accommodated on public sector land. This infrastructure could help support a reduction of carbon dioxide emissions of between 1.5 and 2.6 million tonnes per year. The Mayor has committed to supporting the continued rollout of charging points alongside the private sector, to help meet exponential growth in demand and contribute towards achieving a net zero carbon London by 2030.

The first tranche of our electric vehicle infrastructure delivery programme will provide rapid and ultra-rapid charging points across 100 parking bays on our roads. Charge-point operator Zest was contracted for an initial batch of charging bays in May 2023, and two further batches in November 2023.

We have completed a preliminary assessment of more than 2,400 sites across the GLA estate, which has allowed us to accelerate the release of further batches to the market. In addition, we have reviewed current assessment criteria to bring forward new sites across our land and wider GLA land. We have also initiated a second tranche of delivery, to identify a pipeline of sites to be delivered on both our own and GLA Group members' land.

In addition to the rollout of rapid electric vehicle charging points, the Office for Zero Emission Vehicles has recently announced that London will receive almost £39m of

funding through the DfT's Local Electric Vehicle Infrastructure fund. This will primarily be used to accelerate the delivery of low-powered charging infrastructure on borough highways. This includes residents without access to off-street parking and builds on the 400 fast-charging points that will be delivered by London boroughs by March 2024 using £9.7m of the Local Electric Vehicle Infrastructure pilot funding and additional borough delivery funded by the Government's on-street residential charge point scheme.

Zero-emission bus fleet

We have reached another significant zero-emission milestone and now have more than 1,400 zero-emission buses operating on numerous routes across London. This means 16 per cent of the bus fleet now operates with zero-emission buses, which include hydrogen, battery electric and 'opportunity charged' electric buses.

London has the largest zero-emission bus fleet in western Europe and this progress is key to our wider ambition to convert the entire fleet to zero-emission by 2030.

Zero-emission buses contribute to the decarbonisation of the transport network, which is crucial to our work to meet the Mayor's mission for London to be a net zero carbon city by 2030 (as detailed in London Net Zero 2030: An updated Pathway report). It is estimated that, through the decarbonisation of London's bus network, we could save an estimated 5.5m tonnes of carbon by 2030.

All new buses joining the fleet will also have enhanced customer features, such as improved flooring, seating, lighting and customer information, and will meet the industry-leading Bus Safety Standard.

Introducing new zero-emission buses into London involves collaboration from our bus operators and bus manufacturers. TfL continues to support investment into innovative zero-emission bus technology and jobs and production across the bus industry.

Waste heat

Waste heat from London Underground ventilation shafts is a constant and reliable source of energy. This project will capture thermal energy from the ventilated air to feed to local users, powering heating and hot water.

This project could contribute to serving thousands of residential premises, plus commercial and public buildings. The proposed supply of waste heat would reduce a requirement for gas combustion and could be associated with improved air quality through a decrease in emissions.

Activity is focused on delivering an initial site. A report on the viability of this site is expected by August 2024. The delivery model would be for an energy supplier to fund the design and delivery of the infrastructure. TfL would hold a technical assurance role, to prevent any adverse impact on operations.



Renewable energy helps to reduce our carbon emissions

Our approach to establishing a longer-term programme on the identification of waste heat opportunities will be driven by the outcome of a recent consultation from the Department of Energy Security and Net Zero. This relates to the creation of heat network zones. More will be known on how this will impact future projects for TfL in the coming months, with engagement ongoing with the Department to understand details as they emerge.

Solar private wire

As London's single largest consumer of electricity, it is our responsibility to identify and utilise renewable energy sources.

The Solar private wire project presents an opportunity to directly receive zero-carbon (solar-generated) electricity from decentralised sources, bypassing the national grid and distribution network operators and associated charges. This has the twin benefits of guaranteeing renewable energy, while also offering financial savings.

Initial investigations suggest our power network can accommodate 64 megawatts of renewable energy, equivalent to five per cent of the annual load.

The intention is for a solar collaborator to carry out detailed project identification, design and delivery. We would ultimately purchase the energy to assist with powering the London Underground network. We are currently finalising procurement documentation to support an invitation to tender. Once a contract is secured with a preferred delivery partner, work will begin on creating a design and delivery schedule across a variety of proposed sites.

Buildings decarbonisation

Emissions from our buildings represent around 12 per cent of total operational carbon emissions. As the majority of emissions from our buildings are a result of directly burning fossil fuels – primarily gas-powered heating systems, these are broadly unaffected by grid decarbonisation when compared to other operational emissions, such as running the London Underground network on electricity generated by renewables. This programme has been created to prioritise the removal of fossil fuel heating systems and improving the thermal efficiency of our buildings.

Work is on track to complete feasibility studies across 19 sites by the end of June 2024 and a prioritisation methodology is being developed to inform a delivery schedule.

Grant funding of £2.3m has recently been secured through the Public Sector Decarbonisation Scheme to deliver heat decarbonisation interventions by March 2026 at Neasden depot and Finchley Central signals depot.

In the last year, funding has been allocated to some targeted interventions. A trial of reduced escalator speeds achieved an average 10 per cent power reduction, with associated carbon savings. Plans are underway to reduce the speed of more than 100 escalators. In the next year, 25 escalators across eight stations are scheduled for delivery, to save 32,500kg of carbon dioxide emissions – equivalent to the emissions of an average car travelling more than 120,000km.

Technology

This programme comprises two technology programmes, Operations technology and Technology and data, with a small number of new rail and sponsored-services technology projects



Technology

Forecast period	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost (£m)	Programme and Project Authority (£m)	Variance: Forecast cost v authority (£m)
2022/23 to 2025/26	382	451	833	848	15
Change since last Investment programme report					
No change	69	(95)	(26)	65	

Financial commentary

Projects with the highest spend in the last quarter include the Connectivity asset renewal programme, Project Hina (a project to replace ticket reader technology for buses to aid revenue collection), procurement of new pin entry devices, London Underground station security integration, Project Oval (DfT initiative to expand the acceptance of contactless pay as you go to suburban rail services across south-east England), station WiFi rollout and deployable enforcement cameras.

Increased Programme and Project Authority was approved by the Programmes and Investment Committee in February 2024, covering the period through to 2025/26.

The projects with the largest forecast reductions since last quarter include Surface Intelligence Transport System (SITS), iBus 2 and Oyster online.

iBus2 has decreased in forecasted cost following a successful contract engrossment where TfL mitigated the exchange rate risk on contract signature. In addition, supplier implementation costs were reprofiled against delivery milestones, in line with the final contract position.

Performance over time commentary

Over the last four quarters our forecast spend has decreased by £75m, due to forecast reductions across some projects, as stated in the financial commentary above. Movement in Programme and Project Authority during the year was caused by correction of values stated in Quarter 2, which included an additional £82m relating to a period further out than the forecast period of 2022/23 to 2025/26. This was updated in the Quarter 3 report. The increase in Quarter 4 for 2025/26 spend is described above.

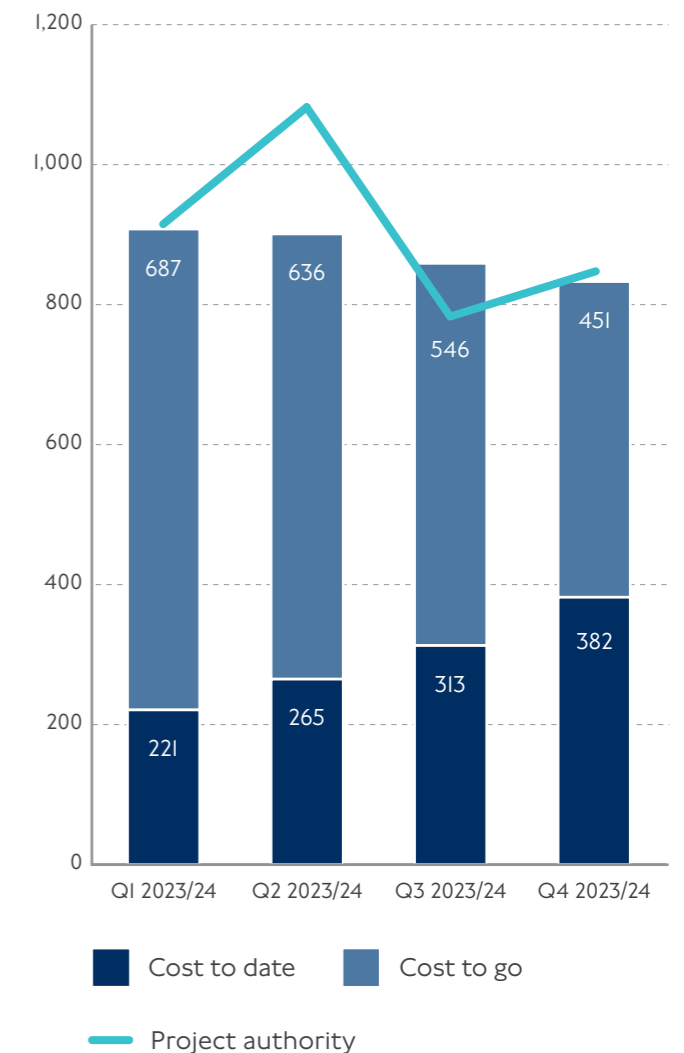
Operations technology Enforcement, compliance, safety and security

Work continues on the rollout of deployable enforcement cameras on our road network, enabling us to target specific safety and non-compliance hotspots and make a significant contribution to meeting our Vision Zero goal. We have identified sites with the most impact to safety and are well underway with the delivery of cameras at these prioritised sites. There are currently more than 150 sites live and monitoring compliance, with a further 100 sites having equipment installed and being prepared for go-live.

Any money recovered from penalty charge notices will be reinvested in maintaining a safe and efficient road network for everyone travelling in London. The cameras are used for enforcement of civil traffic rules only and are fully compliant with data protection legislation.

On average, we manage 10,000 cases of work-related violence and aggression every year. As part of our strategy to address this, the operational employee safety programme has rolled out an additional 700 body-worn video cameras since September to employees most at risk. In total, we have rolled out 6,200 body-worn video cameras and they are now part of essential equipment. We successfully distributed 294 emergency communication devices by the end of 2023.

Technology performance over time (£m)



As part of the station security technology improvement programme, we have completed the design of critical incident management functionality for 14 stations and started the design for 13 stations. The delivery of this functionality in 2024 will enable us to manage these stations during a critical incident and other key events. We will start design of a further 98 stations later this year. We are rolling out safety improvements to our CCTV estate and we can now remotely view CCTV at 243 stations and have started design and installation at a further 22 stations. We are also improving customer Help Points, making sure emergency calls are handled promptly by those best able to help. We have prioritised improvements at 15 stations initially, and design has started at further 40 stations in 2024.

Network and public transport management

We are delivering innovative new road management systems that will reduce delay, improve journey times, and encourage a shift to more sustainable modes of transport.

We delivered the real-time optimiser system into use in Quarter 4 2023/24. This system optimises traffic signals and responds to multiple modes of traffic, improving network performance. Further enhancements to the system are planned for 2024.

For the common operating view incident management system, we are working to complete the final two releases by the autumn 2024, which will enable more effective and efficient management of the

road network and incidents through an integrated interface to the variable message signs on the street.

Real-time optimiser (the system for managing TfL's 6,000 traffic signals) was delivered into live operations in March 2024. This paves the way for FUSION (the optimiser for traffic signals) to be implemented, unlocking journey time benefits for all road users.

Requirements for SITS predictive and video analytics are in the final stages. Once completed, market engagement can begin, enabling TfL to make better data-led decisions around incident management and develop a system that gives the user automated responses to smaller incidents on the network, reducing the time to respond.

We are maintaining and developing technology to operate our public transport networks and improve the customer experience. This includes upgrading the critical technology systems that underpin the bus network, such as the iBus system which provides real-time information on bus locations.

At its meeting on 6 December 2023, the Programmes and Investment Committee granted Procurement Authority for the iBus 2 project. The contract was awarded in February 2024.

Procurement has progressed for the new Countdown 3 system, where the past few months have focused on the evaluation of suppliers and business case development to find the best option, ahead of contract award at the end of Quarter 3 2024/25.

Micromobility rental

Procurement is ongoing for a new operating contract for the Santander Cycles scheme, as the existing contracts expire from 2025. The procurement is due to complete in January 2025.

The London e-scooter rental trial has been operating since June 2021, with 10 participating London boroughs. For the period ending 10 March 2024, more than 3.8 million e-scooter trips have been taken as part of the trial. Following the extension of UK-wide e-scooter trials by the Department for Transport, the second phase of the London trial began on 25 September 2023. This phase presents an opportunity to collect more data on e-scooters, as well as trial new technologies, such as measures to improve parking compliance, identify pavement riding and provide vehicle alerts.

Connectivity

We have completed renewal of radio base stations at 293 sites on London Underground, replacing 20-year-old legacy equipment. This enables critical radio communications between colleagues across London Underground stations, trains and control centres. Since completion, we are benefiting from increased reliability, with no failures to date and lower power consumption, reducing our carbon footprint. The rollout of 7,000 handheld radio devices to London Underground stations has begun, with Bakerloo and Victoria line stations complete.

We are renewing three obsolete radio transmission networks with new infrastructure capable of transmitting multiple types of communication. This work will ensure that critical information

like operational data, CCTV and radio continues to be transmitted, facilitating continued operation of the London Underground network. Detailed design works have begun, and a live system simulation has been completed which will be used for testing. As it rationalises multiple existing systems, it will be cheaper to operate and further reduces our carbon footprint. In 2024, we plan to begin feasibility work on extending this network.

Digital asset management

A programme is being developed to digitise our asset management capabilities to improve future planning, decision-making and efficiency. Procurement has begun for a system to support strategic investment decision-making in a consistent, transparent and evidence-based way. The consolidation of our asset management systems into a single platform to improve performance and efficiency was completed in May 2024..

Tools for planning, automation and staff

We are exploring a new system for staff training and assessment, which will improve the efficiency and effectiveness of our competency management processes.

Future scope

We intend to bring a number of licensing and regulation projects into the Operations technology portfolio. This includes the existing Taxi and Private Hire re-let and statutory standards projects which deliver a replacement system for the management of driver/operator licensing, to meet Department for Transport statutory standards.

The report at the end of June will include licensing and regulation projects in both the financial and programme updates.

Technology and data

Payments

We have successfully delivered the introduction of a new concession for eligible care leavers aged between 18-15 and living in London. From 21 February 2024, in partnership with London Councils, those eligible can apply for an Oyster photocard which entitles them to half-price adult fares on bus and tram services.

On 3 March 2024 we delivered the annual fares revision. As directed by the Mayor, pay as you go fares on our services have not increased. However, fares for joint products, including pay as you go fares for journeys involving National Rail, daily and weekly caps and Travelcards increased by an average of 4.9 per cent, in line with the Department for Transport's direction to the train operating companies.

As part of this fares revision, we implemented a trial of removing peak-time fares on Fridays for a period of three months which started on 8 March 2024. This change means that off-peak Tube and rail fares on pay as you go with contactless and Oyster apply all day, removing the higher-peak fares which applied between 04.30 and 09.30 and between 16.00 and 19.00. The change also means that 60-plus and older persons' Freedom Passes are valid all day during the trial, removing the pre-09.00 restriction. This change was introduced to stimulate economic growth on Fridays, where demand has not recovered as strongly as on other days of the week.

Digital workplace

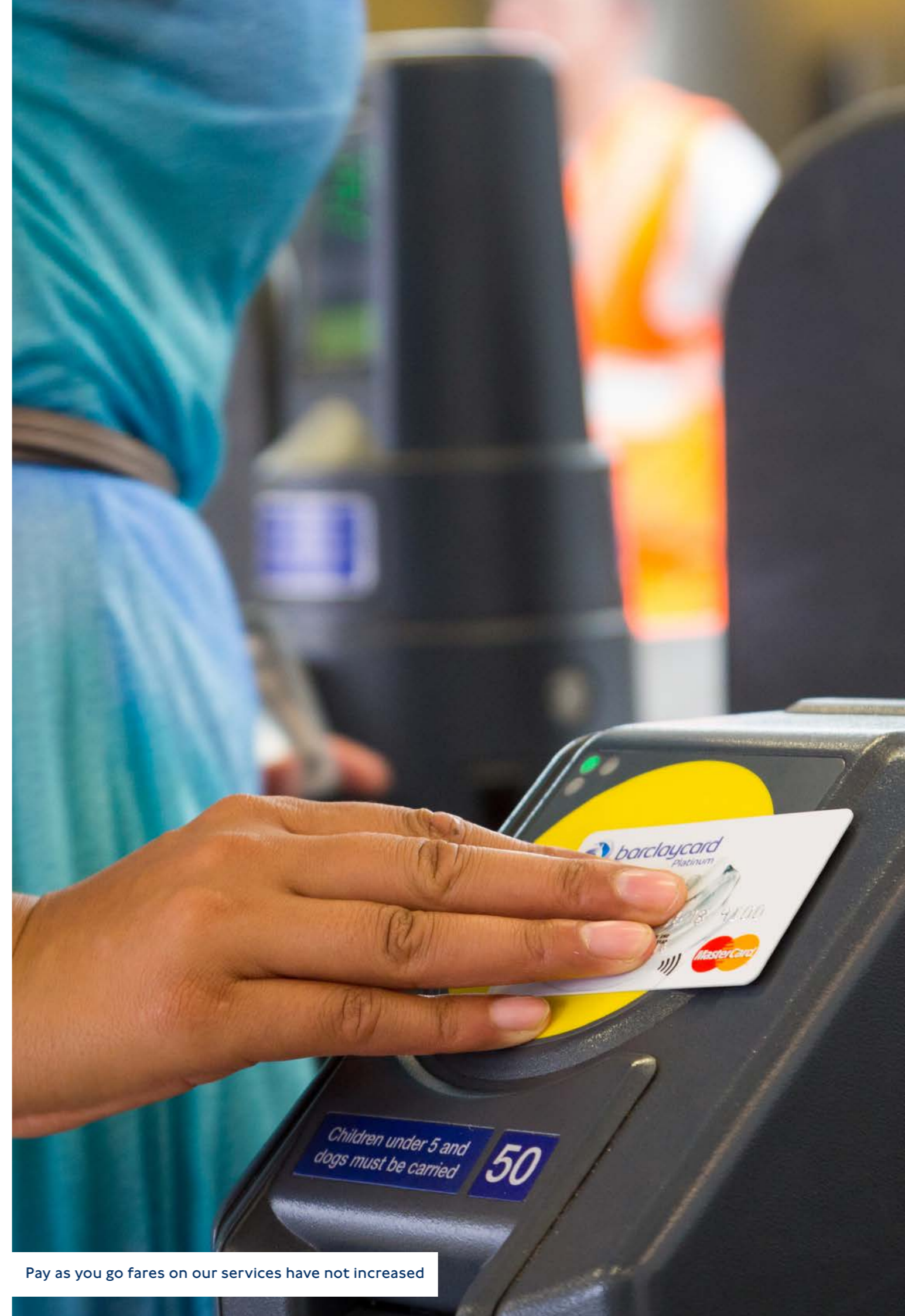
Design work on Our future desktop (successor to Windows 10) is well underway. We have also begun the laptop refresh programme to deliver Windows 11-compatible laptops to users requiring a hardware upgrade. Old laptops continue to be donated for reuse in schools, which not only benefits children in London, but actively supports our sustainability objectives.

With our contracted specialists, Nomensa, we are nearing completion on work to create our frontline and field personas. Once established, the personas will be a precursor to several technology initiatives including the Windows 11 deployment and digital literacy training.

Work to upgrade hardware in London Underground station offices has begun. A survey of equipment was followed by the acquisition of new monitors and speakers for approximately 150 sites, with installation work due to follow in Quarter 2 2024/25.

Networks

Work to extend mobile coverage on the Tube has continued this quarter. Testing has been successfully completed on the Bakerloo, Piccadilly and Victoria lines. Further testing has also been successfully completed on the remaining Elizabeth line stations and Elizabeth line tunnels. The testing opens up opportunities to go live with many more stations and tunnels on these lines in the coming months. We remain on track to deliver improved coverage by the end of 2024.



Pay as you go fares on our services have not increased

Our project to replace the end-of-life data network services that underpin virtually all surface services continues to progress. Our contract with the incumbent provider (GTT) expires at the end of August so our focus is on completing the remaining site migrations

To date, we have migrated 4,571 of 4,596 (99 per cent) sites to the new network delivered by Capita. Of the migrated sites, 55 are currently operating on an interim 4G-based solution.

Hosting

The lease for our main data centre has been extended for six years with an option to extend for a further two years. This extension provides a rent-free period for the first year resulting in a significant saving.

The agreement to use Amazon Web Services for hosting applications has been extended for another two years. This ensures the continued efficient, secure, and reliable operation of services such as SAP enterprise resource planning (ERP) and the TfL website.

Technology services operations

As a central part of the Greater London Authority (GLA) family we are undertaking several initiatives, termed IT shared services (ITSS), that will see TfL assume responsibility for agreed IT systems and services across the GLA family.

In October 2023 there was an initial rollout to 70 Change Champions in the GLA and the Old Oak and Park Royal Development Corporation. As part of this successful phase, useful data was captured and has been acted on. This facilitated a decision in January 2024 to begin the wider rollout in February 2024. To date, more than 500 users have successfully been migrated to their OneLondon devices.

Similarly, the ITSS initiative with London Legacy Development Corporation (LLDC) continues and has progressed from feasibility and planning to an implementation phase. We forecast to have assumed responsibility for LLDC IT shared services by March 2025.

Enterprise resource planning

The myJourney phase 2 project is in progress. This project replaces our core HR system of records and digital system for recruitment and onboarding new colleagues. It is a prerequisite for the new payroll system in future years. Go-live has been set for September 2024 and the project is entering testing.

For our core SAP ERP system and its upgrade to SAP S/4 HANA, we have pushed back the market tender by four weeks to accommodate a revised procurement strategy and the opportunity to closely examine a subscription service-based model proposed by SAP. Process and data improvement work in advance of contract award is progressing well, especially in Operations.

The Operational workforce management project design stage is in progress, with some iterative build activities already completed. Walkthroughs with key stakeholders are planned in the next quarter. The next major business milestone is the launch of new software, UKG Workforce Dimensions, for the rostering and scheduling of compliance, policing on streets, London Underground revenue control and bus operations colleagues in March 2025 as part of phase 1.

This will be preceded by a working pilot from October 2024 to ensure operational readiness. Phases 2 and 3 will then look to deploy the solution across the majority of operational teams in 2026.

Contact centre operations

Contracts have been awarded to Journeycall and Marston Holdings for the contactless payment card contact handling service. The first half of the service, 100 per cent of calls, were transitioned from the incumbent between February and March 2024. All correspondence was transitioned in mid-April 2024.

Evaluation of potential suppliers has been completed for the re-tender of the interactive voice response contract. The contract award recommendation has been approved and the contract was signed in early June 2024.

Data analytics

Over the past nine months, we have gathered with colleagues across TfL to define our vision for data and the principles for our case for investment. We've set out a roadmap of specific data initiatives which will both deliver early business

value and transform our data capabilities, infrastructure and services over the initial 18 months. We also continue to work closely with the One TfL programme to align to the programme's aims to improve TfL's ways of working, and we have articulated our strategic direction for data.

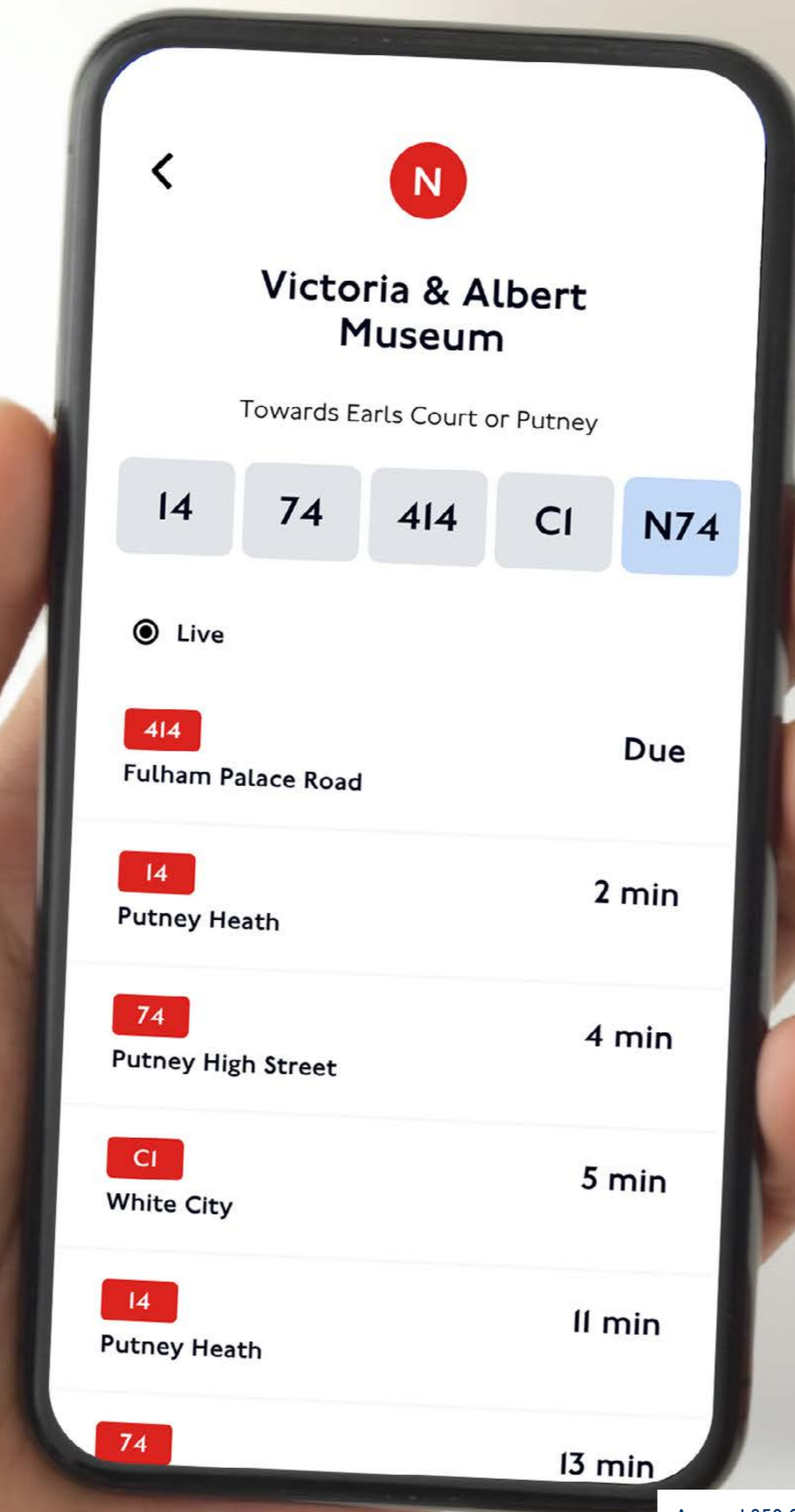
We have started to discuss governance of our data assets, our existing and future needed data capabilities, and how we work to best share learning and best practice to support our vision of empowering our people with data. We published a finalised draft of TfL's Data strategy at the end of March and have engaged with our Executive leadership team, gaining full endorsement on 17 May 2024.

We have gone live with traffic signals data reporting, which has completed integration of the real-time optimiser (RTO) data. This RTO system generates high volumes of traffic flow and general network performance data from the split cycle and offset optimisation technique system.

This data will enable network managers and traffic operational analysts to run ad-hoc analysis on the datasets, enabling them to optimise signal timings, and will help to enhance the automatic management of two-thirds of London's traffic signals.

Digital

The TfL Go app has now been downloaded more than six million times, with 850,000 monthly active users in March 2024. Significant progress has been made with Tube and rail notifications, with an expected release in Quarters 2 and 3.



We also used the app to promote Friday off-peak fares and amended our Journey Planner to ensure that the Elizabeth line was more likely to appear for journeys to Heathrow (avoiding challenging interchanges at Paddington).

We have successfully released the first six components of the mobile payments API (supporting the migration to a new cloud hosting platform). This is a precursor to the release of payments in TfL Go in Quarter 3. Following successful approvals, we are now seeing the first new resources from the Crown Commercial Framework. This will help accelerate the delivery of TfL Go and enabling data products.

Technology challenges

Global semi-conductor supply issues which have previously distorted our delivery due to long lead times and pricing increases at short notice are now resolved, with our strategic partners and their key suppliers having returned to business as usual.

Resourcing continues to be a challenge, with numerous campaigns unable to fill all required vacancies. This issue is most notable for senior or specialist roles. There is a similar challenge in our customer community, with business engagement in projects an ongoing challenge due to business-as-usual operational demands which must take priority. There are issues with supplier resource which have affected delivery this year, however there are signs that the resource pressures in the supply chain are starting to ease, with one of our strategic suppliers now reporting that they have secured all the resources they were seeking.

Street, bus and rail-sponsored service renewals

This programme groups together renewals of Streets, Buses, River Services, London Overground, DLR and London Trams. These programmes share a common approach to work-bank management and by joining together associated activities such as bus-focused renewals this offers improved investment prioritisation and efficiencies



Street, bus and rail-sponsored service renewals

Forecast period	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost * (£m)	Programme and Project Authority (£m)	Variance: Forecast cost v authority (£m)
2022/23 to 2025/26	367	367	733	1,137	404
Change since last Investment programme report					
No change	65	(88)	(23)	No change	

Financial commentary

This programme includes renewal projects previously reported in the Surface assets and Public transport portfolios. This consolidation of projects gives a single focus to maintain a good state of repair on the surface transport networks.

There has been a £23m forecast reduction since the previous quarter, with the forecast having been updated to reflect the asset strategy reprioritisation exercise that was completed for the 2024/25 Budget.

Performance over time commentary

The forecast over the last four quarters has been stable. The Quarter 4 forecast reflects a small reduction to align to prioritised scope. The increase in Programme and Project Authority in the year was granted for scope to be delivered through to the end of 2025/26, and DLR station controllers to the end of 2028/29.

* Forecast cost reflects forecast starting 2022/23 vs authority which includes legacy Public transport portfolio starting 2017/18

Programme update

The programme consists of a capital programme, surface operations assets, surface major assets and Local Implementation Plan support to the London boroughs for bridges and roads. The remainder of the portfolio consists of renewals such as bus, rail and sponsored-services renewals, and supports investment needed to maintain the safety, performance and reliability of the DLR, London Trams, London Overground, Cable Car, Cycle hire, new Routemaster buses and Woolwich Ferry.

Delivery in 2023/24 successfully achieved the planned outputs and benefits, therefore mitigating asset risk and ensuring the continued reliability and safety of our networks. However, the level of investment was significantly below that required (up to 50 per cent lower on some asset types) to remove the backlog of renewals and maintain service levels.

Plans for 2024/25 are now fully developed but, due to constrained budgets, several projects have been deferred.

Securing third-party funding, for example through the DfT's Major Road Network programme, is therefore essential to help mitigate asset risks. Nevertheless, through tough decisions and our work to reduce costs, we are beginning to work through the programme of long-delayed and vital improvement to the network, including further work on the A40 Westway. This a key strategic route and one of our most important freight corridors. It is one of London's busiest roads, carrying around 90,000 vehicles per day.

Streets

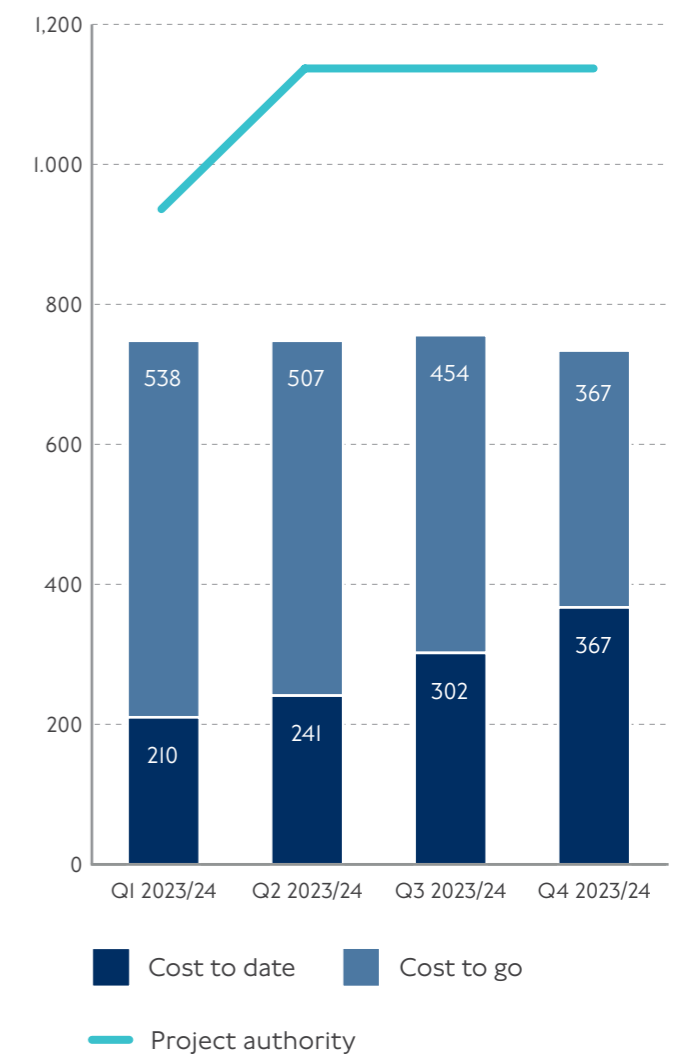
Blackwall Tunnel southbound

This project aims to renew critical systems that support tunnel operation, including lighting, concrete repairs and CCTV. Following detailed modelling assessments, we have selected a preferred construction option: a series of weekend and night closures to minimise impacts on people and goods needing to cross the river. We appointed Tarmac Kier Joint Venture as design and build contractor in April 2023 and plan to complete the design work by September 2024 with delivery timescales subject to budgets and value for money.

Gallows Corner

The Gallows Corner flyover in Romford is one of our highest-priority assets for renewal due to its age, condition and the current restrictions in place. Following the completion of feasibility work, we have selected a preferred option to fully refurbish and strengthen the flyover which has 30 per cent of the scheme carbon compared to the alternative of a full replacement.

Street, bus and rail-sponsored service renewals performance over time (£m)



The concept design using the existing foundations to support the new deck structure has been completed. The outline business case was formally approved by the Department for Transport (DfT) and Treasury in April 2024, unlocking up to £57m support through the Major Road Network Fund towards the required repairs. The contract for design and build has now been awarded and the detailed design stage begun.

A40 Westway

Following successful completion of the major joint replacement, the project is now focused on delivering the remaining scope. This includes further joint replacements, parapet renewals and repairs to concrete deterioration. The project will deliver essential renewals of one of London's key highway assets, ensuring that the road network is safe and operable and avoiding unplanned closures and disruption.

Concept design work for the remaining elements has been completed and we have awarded the contract for work on seven expansion joints. Detailed design is progressing well. We plan to begin the next stage of the delivery from July this year. This includes work on the slip roads at the Westway roundabout. We are working carefully with key stakeholders to coordinate and plan the delivery of this stage project and ensure advance publicity is in place.

We are also progressing with the design of work on three expansion joints to establish the earliest opportunity to replace these remaining vital components. The progress of concrete repairs and other works will start at a future date subject to budget availability.

Hammersmith Bridge

The London Borough of Hammersmith & Fulham started stabilisation works in 2022. The majority of the works are now complete, ensuring Hammersmith Bridge is safe and can remain open to pedestrians and cyclists in the short term. Alongside the DfT, we continue to support the borough in developing a business case for the longer-term strengthening works to fully restore the bridge.

Carriageway renewal

A total of 180,000 square metres of resurfacing was delivered in the year against an initial target of 127,900 square metres. In the last quarter we have delivered schemes at A205 Westhorpe Avenue, A4 Hyde Park Corner, A2213 Kidbrooke Park Road and A3 Tolworth Roundabout.

Two additional schemes were also delivered in the last quarter. funded by the DfT through Network North highway maintenance funding, at A1202 Leman Street and A1210 Prescott Street.

Buses

Kingston Cromwell Road bus station

The major redevelopment of Kingston Cromwell Road bus station will deliver a bus station that offers a better customer experience, is easier to navigate, and is greener and more energy efficient.

The new bus station includes the introduction of energy-efficient lighting, energy-efficient buildings with a low environmental impact, a new sustainable urban drainage system, new vegetation including a green bus station canopy edge, and the introduction of solar panels.

The build began in August 2023 and works are planned to complete by Quarter 2 of the financial year 2024/25.

New Routemaster refurbishment

This programme is the mid-life refurbishment of 998 TfL-owned New Routemaster buses. To date, 575 buses have been refurbished, 297 of which were during financial year 2023/24, and the Tier 2 milestone to complete 430 refurbishments was achieved ahead of schedule.

The programme target for the financial year 2023/24 was to complete a cumulative total of 600 refurbishments. A total of 575 refurbishments were delivered due to the constrained programme budget for the financial year 2024/25 (£1.2m CapEx allocated from the £7m request) which meant that refurbishment centres reprioritised work for the financial year 2023/24 causing some slippage.

With the pipeline of project work turned right down, refurbishment centres have been rephasing their resources to a smaller TfL pipeline, reprioritising other work to ensure they generate enough revenue by working with other bus operators across the UK to protect jobs. The operating expenditure budget impact of this reduced investment will be up to £35m of additional pressure in the next five years. The target for this financial year is still to achieve a cumulative total of 700 refurbishments.

The programme has successfully delivered enhanced customer experience improvements while driving revenue, safety benefits, patronage growth and a reduction in operational costs. It relies upon refurbishment centres based across the UK and has a fully UK-based supply chain.

River Services

We have completed our five-yearly out-of-water assessment and maintenance cycle on both Woolwich Ferry vessels, in line with our regulatory obligations. Both vessels have now received Lloyds Class approval, with successful completion of the Lightship survey on the second ferry at the end of March 2024.

Additional layby berth options continue to be reviewed, with the opportunity to use existing assets instead of building new ones. Meetings have been held with the Royal Borough of Greenwich to agree next steps in using their existing berth.

The operation of the existing auto-mooring system is being reviewed ready to undertake a feasibility study to understand options available to deliver more reliable auto-mooring in the future and to build a strong business case.

Telent have begun preparations for installing our customer Help Points at ferry terminals.

A proof of concept to provide real-time journey information for the ferry service will be trialled during the year to inform next steps with a further project.

Work is ongoing on the linkspan (a type of drawbridge used to allow moving vehicles on and off the ferry in changing tide conditions) and the works are on target to complete by August 2024.

London Overground renewals

We have considered a procurement route through Network Rail for the replacement of the East London line signalling control system. After careful consideration, a new procurement strategy has been developed for TfL to tender the new system through its own tender process. A decision on this approach will be reviewed and agreed by July 2024.

Rhomberg Sersa UK were selected to replace a total of 2,300 insulated track baseplates within the Thames tunnel. They delivered 135 insulated baseplates and prepared a further 1,000 of the new baseplate locations over the 2023 Christmas period. Further preparation of 400 locations was carried out under possession in March 2024. There have been issues with ground conditions and they have opted to amend their delivery mechanism for the baseplates. They are currently conducting off-site trials to ensure the programme is robust. The works are forecast to be complete in March 2025.

Work has started on replacing the redundant BT Kilostream circuits that control the traction power switches for the East London line. BT, Dyer & Butler and Motion Rail are all collaborating on this project, which is expected to be delivered in July 2024.

The final Class 710 train (train 54) was entered into passenger service on 22 March 2024. These trains, alongside the Class 378 trains, ensure a reliable service across the London Overground network. The Class 710 trains also offer additional passenger benefits such as Wifi and USB ports, and have enhanced visual passenger information displays.

DLR renewals

Procurement activities for the renewal portfolio continue, with priority given to critical and safety-related projects. We are looking to achieve efficiency where possible through early engagement with our contractors to understand where value can be achieved.

The replacement bogie frame project for the B92 train type is progressing well. DLR has, in consultation with the franchise operator, developed a new strategy to recover spare bogies from the B92 units being scrapped, which has resulted in a £700,000 saving to the programme while maintaining a sufficient spares. The delays to the introduction of the new trains will increase the pressure on bogie frame replacements, with additional units required. Wheel slip protection trials have been completed. Software installation has begun for the plan to upgrade all I10 train units.

Long-line public address system works are now finished and migration is ongoing to bring the new system online. This system is used for station announcements, which are essential for evacuations as the majority of DLR stations are unstaffed. Automatic people counters rod server migration is complete, and a contract has been awarded to replace the DLR transmission network.



Renewals ensure the safety of the DLR and other services

Signalling

Station controllers are an integral part of the DLR signalling system and the equipment is becoming obsolete. A replacement contract has been awarded to Thales, following a successful negotiation. The existing first-generation station controllers will be replaced with fourth-generation controllers which will support the rollout of the new DLR trains in 2024 and expansion of the DLR network.

The project is now looking to ensure that work required to integrate the new trains, funded through the Government's Housing Infrastructure Fund, is combined to reduce any risks on operational requirements. Loop cable renewal continues with the majority changed on the west, Stratford International and east routes of the network.

High-voltage projects

High-voltage projects were impacted by the UK Power Networks (UKPN) sub-station fire at Poplar in March 2022. As a result, UKPN completion of power supply was delayed until July 2024, requiring some key projects to be re-programmed so as not to affect services. The Poplar direct current (DC) switchgear has been commissioned into service. Custom House DC replacement switchgear is commissioned into service. Works have completed on shore supply at Beckton and have begun at Poplar depot, which provides power in the workshops to move trains without the third-rail traction system. Poplar depot power supply has been sectionalised and works completed at Royal Mint Street for additional low-voltage supply to the substation. A contract has been awarded to replace eight transformer rectifier units to support the new trains project.

Low-voltage renewals

Canary Wharf and Heron Quays low-voltage renewals are progressing, with Heron Quays planned to be completed in Quarter 4. West India Quay lighting renewal has been commissioned into service. Poplar low-voltage renewals are complete, including the migration to the new switchgear.

An opportunity has arisen to change the ceiling tiles at Canary Wharf, for which we have completed the scope, and the works are ready for tender. Low-voltage distribution upgrade works continue, with 80 per cent of the works completed. Tenders for the remaining LED renewals work are being reviewed, ready for appointment in the first quarter of 2024/25.

Platform resurfacing

The second phase of platform resurfacing has started, with designs approved for All Saints, Royal Albert and Prince Regent. Construction work has begun at Royal Albert, with the team using existing possessions and engineering hours. We have completed the Bank tunnels cross-passage door surveys, which will allow us to agree product selection with our contractors. Station equipment rooms surveys have started to ascertain the scope required to bring the rooms to meet fire-rating standards. A contract to replace the existing carbon dioxide fire suppression with a technical gas has been awarded and has begun.

Track fixing

Track-fixing works continue, and we completed more than 1,000 baseplates in Quarter 3. Switch and crossings renewals of 1,126 points were undertaken over Christmas, during a week-long closure. Trials have started at Bank tunnel to mitigate against structural clearance issues.

Lift upgrades

The lift system upgrade project has started on the next phase of 46 lifts. Three escalators at Cutty Sark have been refurbished and returned to service. Two escalators at South Quays have returned to service following refurbishment. Work has begun on lift renewals at Westferry, Limehouse, City Airport, King George and Star Lane. We have also begun mid-life refurbishment on the escalators at East India and Canary Wharf.

London Trams renewals

Our renewals programme continues across five asset groups: rolling stock, power, civils, systems and permanent way infrastructure.

Installation work for both the wayside and on-tram upgrades to communications equipment are now complete, and we have completed the correct-side door enabling system on the Bombardier CR4000 trams.

Track renewals

The first phase of the East Croydon and George Street track renewal was successfully completed during the track closure in February 2024 and the second phase was completed in the second closure in April 2024. The ballasted track renewal at Sandilands junction was also completed in the April 2024 closure.

We have initiated site surveys and design work for future track renewals projects, such as Shirley Hills road crossing, Kent Gate Way road crossing, Saffron Curve and Barclays Curve embedded track renewals, and Mitcham Interlace ballasted track renewal. These projects are expected to be on site in 2025.

Birkbeck tram stop

We completed site investigations to replace the retaining wall and step-free access ramp at Birkbeck tram stop and identified that an updated design is needed. The design plans have been issued to the contractor for pricing and the works are planned to start in 2024, subject to funding.

London Trams depot

In May 2022, we awarded a contract to replace fire doors at the London Trams depot and ensure compliance with current fire safety standards. However, due to supplier delays, works restarted in October 2023, and the fire doors were completed in March 2024. The compartmentation aspects have been rescheduled for delivery in August 2024.

The contract for TfL's first net zero carbon project – Therapia Lane depot decarbonisation – is ready to be awarded, with work currently forecast to start in Quarter 3 of 2024/25.

Tram control system renewal

The feasibility study for the tram control system renewal to replace critical life-expired components is ongoing and will complete in Quarter 2 of 2024/25.

London Underground renewals

This programme delivers critical renewals across multiple asset groups that form an integrated transport system, including whole-life asset interventions on our train systems and wider infrastructure. The programme also includes renewals for the Elizabeth line and our colleague welfare projects



London Underground renewals

Forecast period	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost (£m)	Programme and Project Authority (£m)	Variance: Forecast cost v authority (£m)
2022/23 to 2025/26	752	802	1,554	3,721	2,167

Change since last Investment programme report					
No change	148	(242)	(94)	No change	

Financial commentary

Quarter 4 closes the 2023/24 financial year with strong performance observed throughout, delivering £431m of costs to date. There was £148m of cost to date between Quarters 3 and 4, as TfL reports 13 periods, Quarter 4 includes four periods of reporting rather than three.

The key movements this quarter are observed across the Central line improvement programme (£13m), Fleet overhauls (£34m), Track (£45m) and Systems and infrastructure (£31m), with the balance delivered across remaining asset categories.

Cost to go and forecast cost have reduced by £242m and £94m respectively, due to the rephasing of spend until after 2025/26 and being outside of the reporting period. This reflects the recent asset strategy reprioritisation as part of 2024/25 budget setting.

The variance between cost to go and authority is due to requested authority for years beyond the reporting period.

Performance over time commentary

Between 2022/23 and 2023/24, London Underground renewals have delivered £752m of spend to date. In the year to date, £29.6m of cost reductions and efficiencies have been delivered. The reduced cost to go between Quarters 3 and 4 is due to a further reprioritisation exercise.

Network-wide track renewals

In Quarter 4, we converted 3,092 metres of bullhead rail with the more modern flat-bottom form. We also completed 518 metres of deep tube renewal (DTR) reconditioning works, thereby improving reliability and reducing noise.

Weekend possessions this quarter delivered the following:

- In January, 288 metres of ballasted track renewal (BTR) through Sudbury Town westbound platform on the Piccadilly line and 133 metres of new drainage, three catch pits and an under-track crossing

- In February, 131 metres of BTR, 36 metres of track drainage and new train arrestor installation at Acton Town sidings and renewal of five points and crossing units at Northfields station on the Piccadilly line
- In March, 195 metres of BTR between Kings Cross St Pancras and Farringdon and 189 metres between Gloucester Road and South Kensington

Victoria line (fleet overhaul and depot control system renewals)

We completed installation of the pressurised ventilation system, coupler overhaul, trailer wheelset overhaul, phase 1 of door works across fleet and phase 2 of door works on 32 of 47 trains..

Metropolitan line (fleet overhaul)

Overhaul of bogies (the structure which supports the train carriages and includes wheels, bearings, and axles) is progressing to plan, with 57 of 60 trains completed.

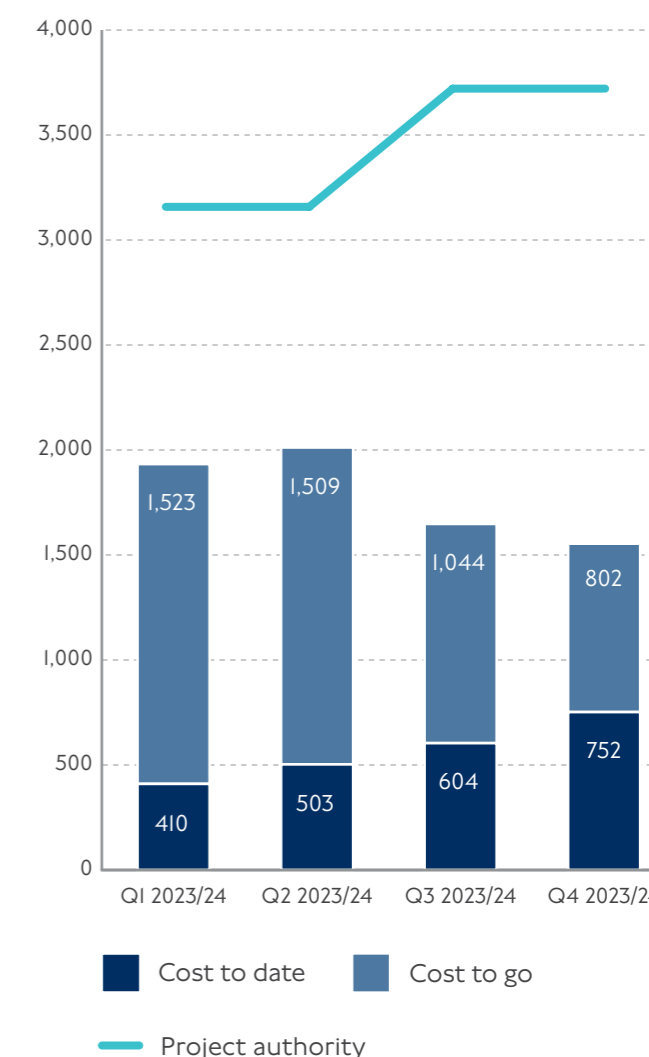
Metropolitan line (Liverpool Street escalators)

We completed civils enabling works and started delivery of the three escalators ahead of schedule. Parallel works to the electrical and fire systems continue as planned.

District line (fleet overhaul)

We are progressing with preparations and work scoping to start overhaul of the S7 fleet (Circle, District and Hammersmith & City lines) in 2025/26 at a reduced rate of one train per period due to financial constraints.

London Underground performance over time (£m)



Jubilee line (fleet overhaul and component renewal)

We completed programmed lifts on 28 of 63 trains. In March 2024, we awarded the contract to repair the underframe cracks.

Jubilee line (station communication and ventilation systems)

In March 2024, we completed station communication systems renewals and brought them into operational use at all sites. This includes software migration to the new management integration and control of assets system which now operates the public address systems, customer information screens and customer Help Points at nine stations on the Jubilee line between Westminster and Stratford.

We are progressing on schedule with works to upgrade the obsolete tunnel ventilation control panels and refurbish the fans of the staircase pressurisation system from Southwark to Canning Town and intermediate shafts. The overall ventilation programme is scheduled to finish in September 2026.

Jubilee and Central lines (escalators)

In Quarter 4, we delivered three escalator refurbishments at Bank, Canada Water and London Bridge stations.

We are working on the next three refurbishments at Bank, London Bridge and Canning Town stations, which are currently forecast to be returned to service by the end of June 2024. These works continue to incorporate the opportunity to renew fire linear heat detection systems in the escalator machine chambers.

Jubilee and Northern lines (incremental signalling upgrade)

We are progressing with detailed design for the replacement of central computers on the Northern line, with installation works started for the first pair of computers. The design for works to replace the train operator displays on both lines were completed in May 2024.

Northern line (Kentish Town escalators)

We completed enabling works and both new escalators have been installed, allowing for electrical works to begin. Remedial works to platform tiling and ticket hall ceiling and floor has begun. The station is due to re-open to the public in September 2024.

Piccadilly line (fleet overhaul and signalling renewals)

We completed programme lift and phase 1 door overhauls. We also completed approximately 90 per cent of phase 2 door overhauls.

Piccadilly line (Holloway Road lifts)

Due to further issues experienced in commissioning the new type of controller, lift 1 was returned to service on 4 June 2024, and the replacement of lift 2 is expected to start by the end of June 2024. This will allow further work to ensure the new lift performs as designed and provides the required level of reliability.

Central line (fleet and signalling renewals and incremental signalling)

In Quarter 4, the first refurbished train successfully operated through-tunnel runs and served an equivalent of 50,000 passenger journeys.

The Central line signalling life extension and Control and information projects continue to make progress on obsolescence and maintainability by replacing key assets on the Central line.

In March 2024, in collaboration with Siemens, there was a successful 52-hour closure on the east end of the Central line. New assets were tested and commissioned to replace obsolescent signalling room assets at Debden, Epping, and Theydon Bois.

Feasibility and planning for the first tranche of the incremental upgrade to the signalling interlocking computers on the east end of the line continues, with full contract award expected in the first quarter of 2026.

Bakerloo line (fleet overhaul, LED lighting conversion and signalling upgrade)

We completed the overhaul of traction motors and wheels. Work is continuing on programme lift (50 per cent completed), heavy overhauls (60 per cent completed) and trailer wheels (15 per cent completed).

We achieved 100 per cent LED conversion on the fleet in April 2024. Ten trains are also fitted with wheelchair bays and the new passenger information system passed live testing on the line.

We continue to install the key signalling and control interface equipment in lineside rooms. Fifteen out of 16 sites have been finished, with Waterloo recently completed as planned. Cable installation and some initial testing has begun.

Bakerloo line (Marylebone escalators)

The work was finished on the final escalator replacement in September 2023.

In Quarter 1, we completed station welfare renewals works and fire hydrant upgrade works are progressing to programme.

We also completed work on the gateline and the final Bostwick gate and panelling works are due to complete in July 2024.

Bakerloo, Central and Waterloo & City lines (accessibility)

Public consultation on London Underground application to extend the rail vehicle accessibility regulations exemption for the Bakerloo line to the end of 2029 closed on 28 March 2024. We responded to consultation comments so that the application can be considered when Parliament returns after the Easter recess.

Rail adhesion train

We completed overhaul of Central line rail adhesion trains, and the project is now closing. Preparations are in progress to begin overhaul of District line rail adhesion trains, with the scope of works agreed.

Mechanised track renewal vehicle

We've made final adjustments to the mechanised renewal vehicle (MRV) following consultation with trade unions, including the addition of a deployable ladder for welfare access. Final trials of the vehicle will take place by September 2024, following which the MRV will be available for booking for other project works.



London Underground renewals improve accessibility and safety

Modular points and crossings

We are continuing assurance works to guarantee that Kirow cranes are safe to use in sub-surface environments. Remaining open and tunnel sections tandem lift safety assurance approvals are due to be delivered by November 2024.

Remote track monitoring

The project is delivering new equipment which will be installed on two wagons to enable track condition recording. This will increase service reliability and provide critical data to keep the network safe. A feasibility study to determine the next phase of the project was completed in April 2024 and is currently under review.

Engineering vehicle overhauls

The battery locomotive and repair process for the bogie frames is currently under trial, with completion expected by the end of June 2024. Successful completion of this testing will enable the full production programme for the bogie frame repair and overhaul to begin. This will be an integral part of the battery locomotive overhaul programme, including a similar strategy for the traction motors.

In addition, we have mobilised a new workshop facility at our Acton works depot to enable directly employed maintenance teams to carry out overhaul works on our fleet of engineering wagons. The facility is now up and running and work on the first two wagons to be overhauled is ongoing, and due to complete at the end of June 2024. We expect to be able to achieve a beat rate of two wagon overhauls per period by mid-2024. Work to overhaul one of our Matisa tampers began in February and is expected to complete in mid-2024.

Network-wide water ingress remediation

A single tender return was received for a design and build contract for works at Mayor Sworder's Arches substation, but was non-compliant. Feasibility work is being carried out to develop a solution (scheduled to be completed by the end of June 2024) in advance of concept design update and procurement for the build.

Because of resource constraints, concept design completion for St Paul's and Chancery Lane stations has been delayed from August to December 2024 and detailed design for Liverpool Street and Charing Cross stations is now planned for completion in June 2025.

Network-wide cutting and embankments

We continue works to stabilise the cutting between Grange Hill and Chigwell stations on the Central line to ensure safe running of the railway, including strengthening the N31 footbridge and drainage works. The project is due to finish on site in late June 2024.

Cabins are now coming off site and reinstatement works will start shortly. The contractor has identified that the original programme for the reinstatement works was unrealistic, since it did not fully account for all on site activities nor for inclement weather, which resulted in the reprofiling works being put on hold.

Procurement of topographical, ecology and vegetation clearance at Finchley Central and Mill Hill East stations and at Triangle sidings is ongoing. Ground investigation survey works started on site in April 2024 between Debden and Loughton and between Northolt and South Ruislip. Procurement of a constructability report for North Acton to Hanger Lane is also ongoing.

Plaistow power substation roof replacement

We delivered all works, and the project is moving to close, expected, which is planned for July 2024.

Station platform remediation works

Remedial works at 10 sites (delivery phase 1) will start in July 2024 and are scheduled to complete in December 2024. The delay to start on site is due to the contractor's IT system being compromised and the need to ensure the issue had been rectified, as well as a new project management team being assigned to support project delivery.

We began procurement for remedial works at 14 sites (delivery phase 2). Contract award is due in March 2025, with start on site in July 2025.

Design of the remaining platforms selected for remediation is continuing, and site works for those are scheduled to start in June 2025.

Welfare facility renewals

We started site works at Goldhawk Road, Westbourne Park and Royal Oak stations. Designs at five further sites are nearing completion. Procurement for five substation facilities is ongoing, with tenders for two further sites released in May 2024.

Smoke and heat exhaust ventilation systems

We are replacing and refurbishing the life-expired components that form part of the smoke and heat exhaust ventilation systems located in the roofs of Bermondsey station and Stratford Market depot. We started site works at Stratford and works are scheduled for completion in late 2024.

Secondary lifts (supporting step-free access)

Due to further delays in receiving the electrical designs, the works at Green Park have been delayed by a further two months. Start on site at Green Park was achieved on 5 May 2024.

Works at Hounslow East and Bermondsey stations are progressing to plan.

Uninterruptable power supply (UPS)

Rolling replacement of the UPS is continuing as planned. Ten have now been commissioned on the Victoria and Jubilee lines, with 16 being manufactured for completion in 2024/25.

Offline battery power inverters

As part of the replacement programme, 20 units have been successfully commissioned so far, and a second tranche of 40 are being manufactured, with the first unit factory-tested and installed in May 2024. These new units include product development changes and recycling of key components that will help mitigate the obsolescence risk of the remaining units.

A separate market engagement has been conducted and contract specifications are being prepared for further units as part of the strategy work on the longer-term solution.

Traction power

Design work to replace isolation switches in sidings were planned to begin in 2024/25 but will need to be deferred to prioritise spending in more critical areas.

A replacement switchboard at Holborn has been installed and pre-commissioning activities completed in March 2024. Full commissioning into service was achieved on 28 April 2024, a little later than planned, to ensure additional operational requirements were addressed.

LED lighting

We continue work at all three depots, with Ruislip and Hainault 95 per cent complete. Work will slow in 2024/25 due to constrained funding.

LED conversion at King's Cross St Pancras station is currently 20 per cent completed. The conversion will be completed by the end of 2024/25.

Small station conversion continues, with 17 stations fully completed in 2023/24. This is lower than projected, however a number of the larger stations in this classification have been completed. The replacement rate of 1,000 lamps per period has continued as planned. This will reduce carbon output by 360 tonnes next year.

East Ham wall rebuild

We are undertaking a gap analysis of the feasibility work with a contractor.

A combination of access licences and processes under the Party Wall etc. Act 1996 are being arranged for 28 properties that border the railway. Site works are expected to start in Quarter 3 2024/25.

Elizabeth line renewals

The Ilford staircase replacement works were completed during the February blockade and the Ilford platform 4 roof replacement works finished in April 2024.

Works to install tactile paving at Manor Park and Romford stations were completed, as well as the replacement of the footbridge tiling at Chadwell Heath.

The project to replace obsolescent lighting with new LED fittings at Canary Wharf is currently underway.

The completion of remaining voltage transformer renewals has been delayed to the end of June 2024, due to Network Rail possession availability.

Railway systems enhancements

We continue delivery of the Northern line signalling software updates, with the most recent update being commissioned in January 2024. This update rectifies non-safety-related issues that the service controllers encountered at Highgate control centre and the train operators experienced on the rolling stock operator displays.

These software updates address residual issues and requirements following completion of the Northern line extension and the Bank station closure works. The final software release is scheduled for Quarter 3 2024/25. This has been rephased to accommodate other projects that are dependent on the same supplier key resources, including the Four Lines Modernisation and DLR rolling stock replacement programmes.

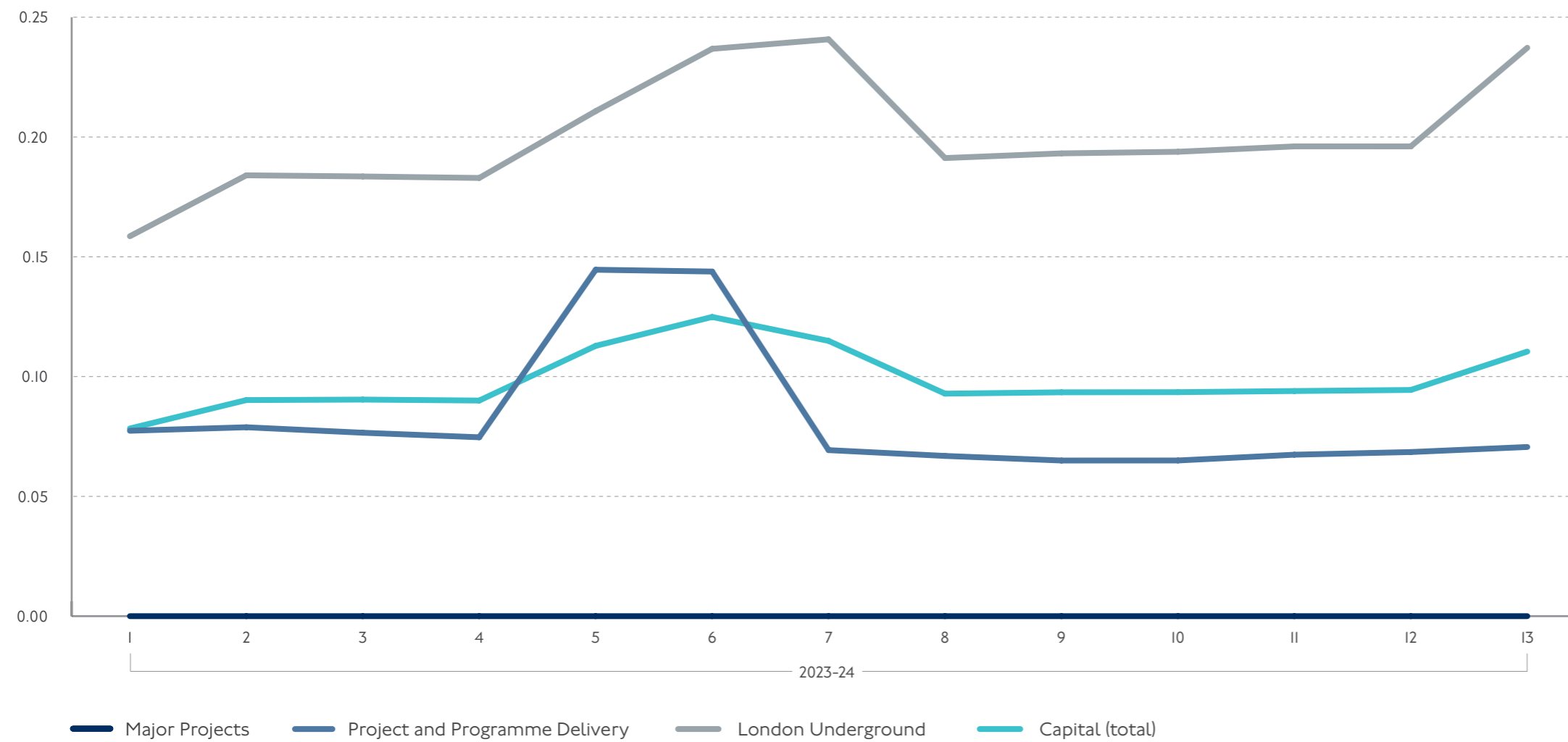
Delivery of Jubilee line signalling software updates continues. The final software release is currently scheduled for Quarters 3 and 4 2025/26. This is dependent on successful delivery of the Four Lines Modernisation programme on the Jubilee line taking place in Quarter 2 2024/25.

Appendix

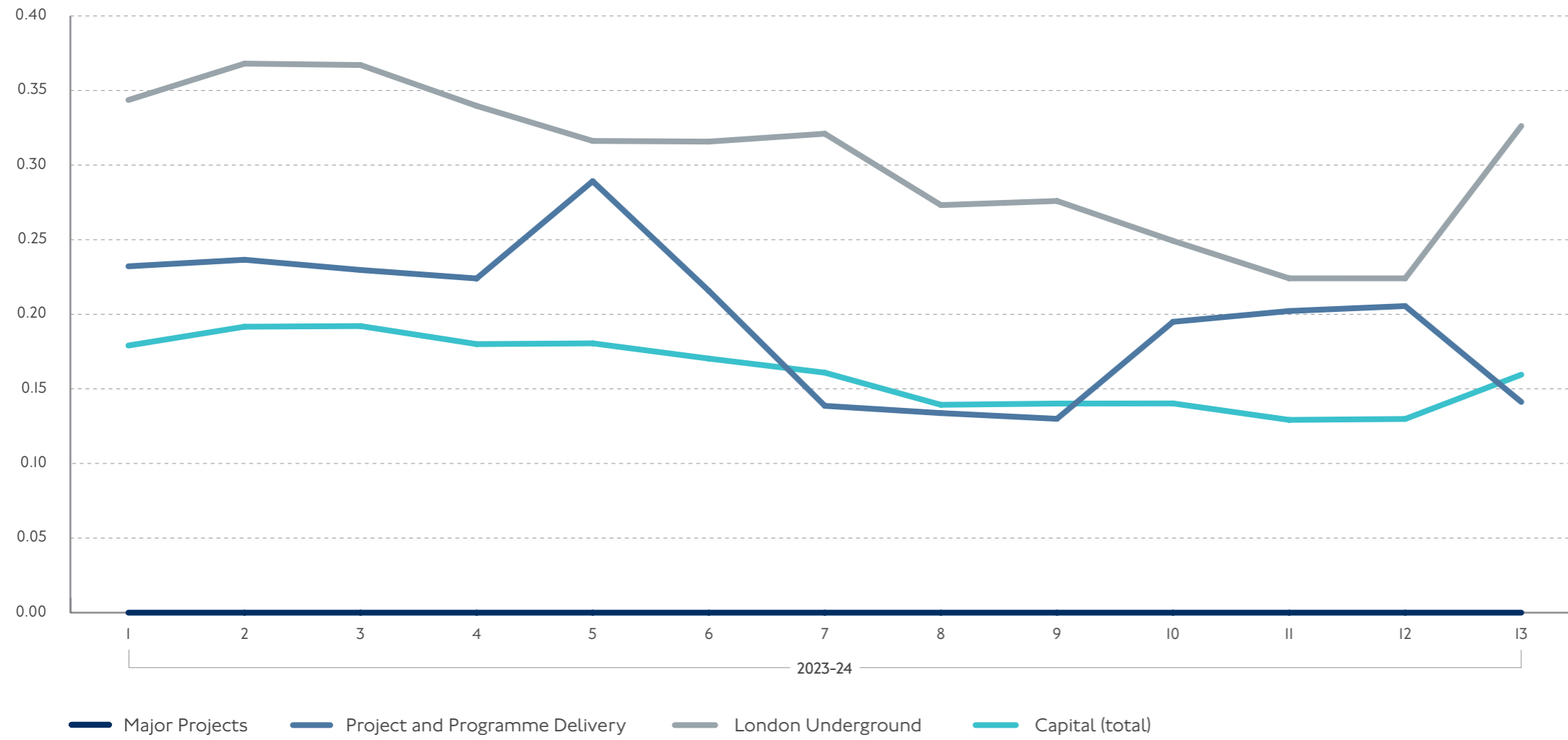
Our safety performance data

We track the number of injuries among our workforce to show our progress towards our safety ambitions

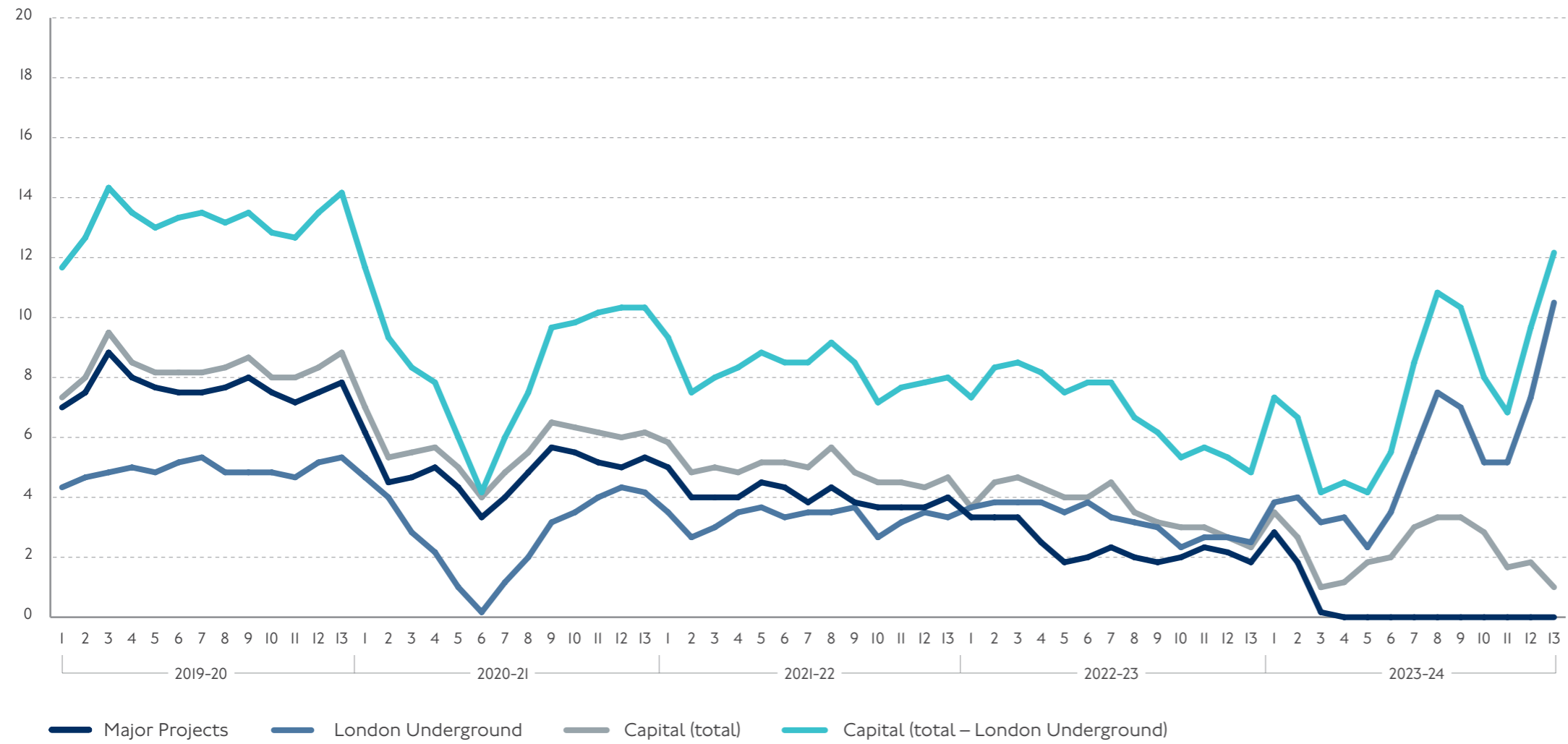
RIDDOR accident frequency rate
(per 100,000 hours worked)



Lost time injury frequency rate
(per 100,000 hours worked)



Total Capital workforce injuries
(six-period average since 2018/19)



About us

Part of the Greater London Authority family led by Mayor of London Sadiq Khan, we are the integrated transport authority responsible for delivering the Mayor's aims for transport. We have a key role in shaping what life is like in London, helping to realise the Mayor's vision for a 'City for All Londoners' and helping to create a safer, fairer, greener, healthier and more prosperous city. The Mayor's Transport Strategy sets a target for 80 per cent of all journeys to be made by walking, cycling or using public transport by 2041. To make this a reality, we prioritise safety, sustainability, health and the quality of people's experience in everything we do.

We run most of London's public transport services, including the London Underground, London Buses, the DLR, London Overground, Elizabeth line, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the IFS Cloud Cable Car.

We manage the city's red route strategic roads and are responsible for the maintenance, management and operation of more than 6,000 sets of traffic lights across the capital. The London boroughs are responsible for all the remaining roads within their boundaries. The experience, reliability and accessibility of our services are fundamental to Londoners' quality of life. Safety remains our number one priority and we continue to work tirelessly to improve safety across the network for both colleagues and customers.

Our vision is to be a strong, green heartbeat for London. We are investing in green infrastructure, improving walking and cycling, reducing carbon emissions, and making the city's air cleaner. The Ultra Low Emission Zone, and fleets of increasingly environmentally friendly and zero-emission buses, are helping to tackle London's toxic air. We are also improving public transport options, particularly in outer London, to ensure that more people can choose public transport or active travel over using their vehicles.

That is why we are introducing the outer London Superloop bus network, providing express bus routes circling the entire capital, connecting outer London town centres, railway stations, hospitals and transport hubs.

We have constructed many of London's most significant infrastructure projects in recent years, using transport to unlock economic growth and improve connectivity. This includes major projects like the extension of the Northern line to Battersea Power Station and Nine Elms in south London, as well as the completion of the London Overground extension to Barking Riverside and the Bank station upgrade.

The Elizabeth line, which opened in 2022, has quickly become one of the country's most popular railways, adding 10 per cent to central London's rail capacity and supporting new jobs, homes and economic growth. We also use our own land to provide thousands of new affordable

homes and our own supply chain creates tens of thousands of jobs and apprenticeships across the country.

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

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

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