



# Investment programme report

Quarter 4 2022/23  
(11 December 2022 to 31 March 2023)

Appendix I

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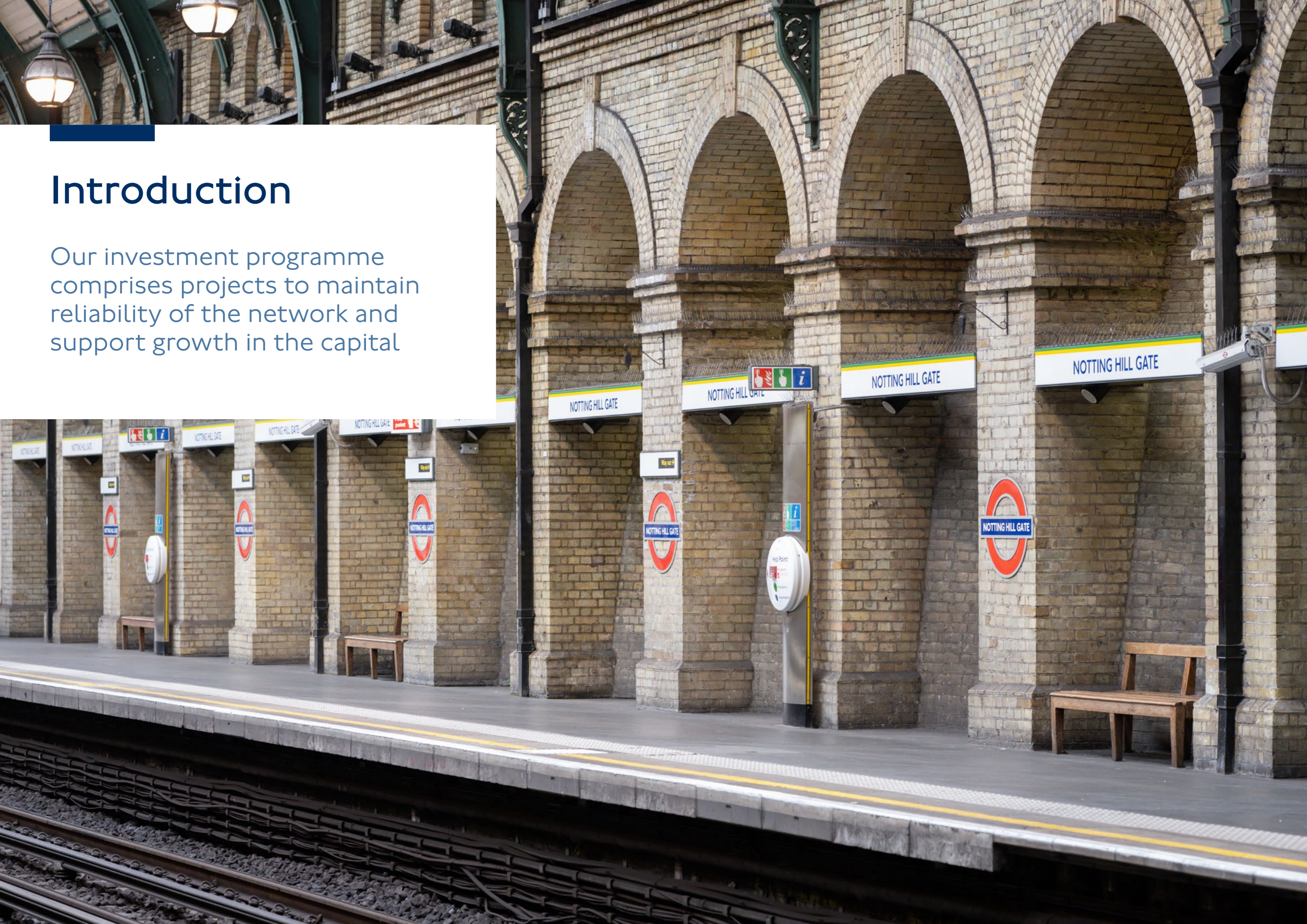
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# Introduction

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



# 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, TfL Rail, 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 to the Programmes and Investment Committee. It includes programmes comprising 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 11 December 2022 to 31 March 2023. For each key project or programme, the financial and milestone data represent the position at the end of Quarter 4 and includes 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.





Our work includes new infrastructure and major upgrade projects

# Investment programme delivery structure

Our investment programme is delivered by the following areas of the business: Major projects, London Underground, Surface transport and Professional services. This is reflected in the structure of this report.

## Major projects

This area is responsible for 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, the Elizabeth line and Crossrail.

## London Underground

This area covers enhancements, infrastructure renewals, train systems renewals and technology.

## Surface transport

This area comprises healthy streets, air quality, public transport and asset investment.

## Professional services

Our professional services area comprises technology and data, media and our growth fund.

During Quarter 2 2022/23, on 1 September 2022, we created a new director structure. The changes will see the majority of capital works fall under Capital, the area overseen by the Chief Capital Officer. However, more detailed assessments to determine and implement the structure are ongoing, so for consistency with our reports for the first three quarters of 2022/23 there has been no change to how this report is structured.

# Our performance

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



# Safety performance

Coronavirus remained the top cause of short-term staff absence and significantly increased as a proportion of total staff absence, from 27 per cent in Quarter 3 to 44 per cent in Quarter 4. Mental health and musculoskeletal-related health remained the top two causes of long-term absence, which is in line with the national average. Our Occupational Health team continues to run events aimed at giving staff the tools to better look after their mental health.

## Capital

Capital includes activity under the Chief Capital Officer as well as maintenance activity for which the Chief Operating Officer is responsible. In Quarter 4, our Capital teams worked a combined total of 2.6 million hours, an increase of 600,000 hours from the previous quarter.

## Quarterly performance

There was one incident reported under the Reporting of Injuries Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) in Quarter 4, taking the annual total to seven. As a result, the RIDDOR accident frequency rate for the Capital area fell, ending the year at 0.07 injuries per 100,000 hours worked.

During the same period there were five lost time injuries (LTIs) reported, which are injuries that cause an employee to be absent for one or more shifts. Although this represents a reduction on Quarter 3, the frequency rate remains stable due to the relative increase in the number of LTIs reported during the second half of 2022/23.

In total, there were 18 injuries reported during Quarter 4, four more than reported during Quarter 3. However, the long-term trend of workforce injuries in Capital continues to decline year-on-year as we work towards our zero-harm ambitions.

## Annual trends

Manual handling incidents (those involving people lifting or carrying loads) were the most common type of injury to members of our workforce during 2022/23, closely followed by slips, trips and falls. Among root causes identified, insufficient task planning, inadequate risk assessments and issues with the working environment were particularly prevalent.



We monitor the health and safety of our workforce



The train control system introduced in Quarter 4 is working reliably

#### Significant incidents and near misses

In addition to recorded injuries, we also capture and review incidents that could have resulted in harm. This quarter, these incidents have included:

##### Old Street beam

During a night shift on the Old Street Roundabout project, one of our subcontractors drilled into a structural beam supporting the carriageway. In response, the contractor installed temporary props and surface level barriers to prevent traffic flow in the area. An investigation is in progress which will consider whether this could have been identified and prevented at the design stage.

##### Four Lines Modernisation

The new train control system was successfully introduced in both signal migration areas 6 and 7 during Quarter 4, which was a significant achievement. System reliability so far has been good.

Unrelated to the commissioning of SMA7, we have identified two software issues which are currently being mitigated through additional operational restrictions. The impact of resolving these issues has been assessed and a plan is now in place to address these prior to implementation of the Finchley Road to Preston Road signalling section (SMA8). We have also informed the Office of Rail and Road and will continue to keep them informed and updated of all developments.

##### Fencing panels

In East London, several fencing panels between one of our tracks and local residents' gardens became loose, leading to risk of people being able to access the track. We took immediate action, with our Civils team securing the fence.

##### Asset damage at Beckton Depot

A small steel post and concrete base were installed at a site in the depot to support future assets. The first DLR passenger train to pass this site struck the post, knocking it over. The train operator and shunter reported the strike and all installations within gauge stopped. The team moved the post and base further away from the track. An investigation was carried out and lessons were shared with all duty holders to prevent recurrence.



# Schedule performance

We have achieved a number of scheduled milestones throughout the year

## Four Lines Modernisation

In March 2023, we completed the signalling system upgrade on the section of the District line between Dagenham Heathway and Upminster.

## DLR rolling stock

In April, dynamic testing (20,000km) started on the new DLR rolling stock.

## Piccadilly line upgrade

In June, the first car body was built and painted in the TfL livery.

## Silvertown Tunnel

In August, we began using the tunnel boring machine to bore in the southbound tunnel.

## Barking Riverside

In July, operational service begun between Barking Riverside and Gospel Oak.

## Bank station upgrade

In May, we reopened Bank station following a 17-week closure. The new station is now open and operational, and the new passenger concourse for the Northern line is now open for use.

## London Underground

In June, seven new escalators were installed and brought into customer use.

In August, we completed the heavy overhaul of the first 15 Metropolitan line trains.

In March, we completed delivery of 1.5km of deep Tube track.

## Borough station

In August, we completed the lift renewal and ticket hall enhancement.

## Brompton Road

In September, a new Brompton Road entrance opened at Knightsbridge station.

## Old Street

In July, the new station entrance at Old Street opened.

## Road User Charging scheme

In November, we completed the statutory public consultation on the Road User Charging scheme.

## Westminster Bridge

In July, we completed construction of the Hostile Vehicle Mitigation programme at Westminster Bridge.

## A40

In July, we successfully completed the major joint replacement on the A40 Westway.

## Major Asset Renewals Programme – Brent Cross

In October, we received the consultant's submission of the Options Assessment report for Brent Cross.

## Cycle hire

In October, we launched 500 e-bikes for hire as part of the cycle hire modernisation project.

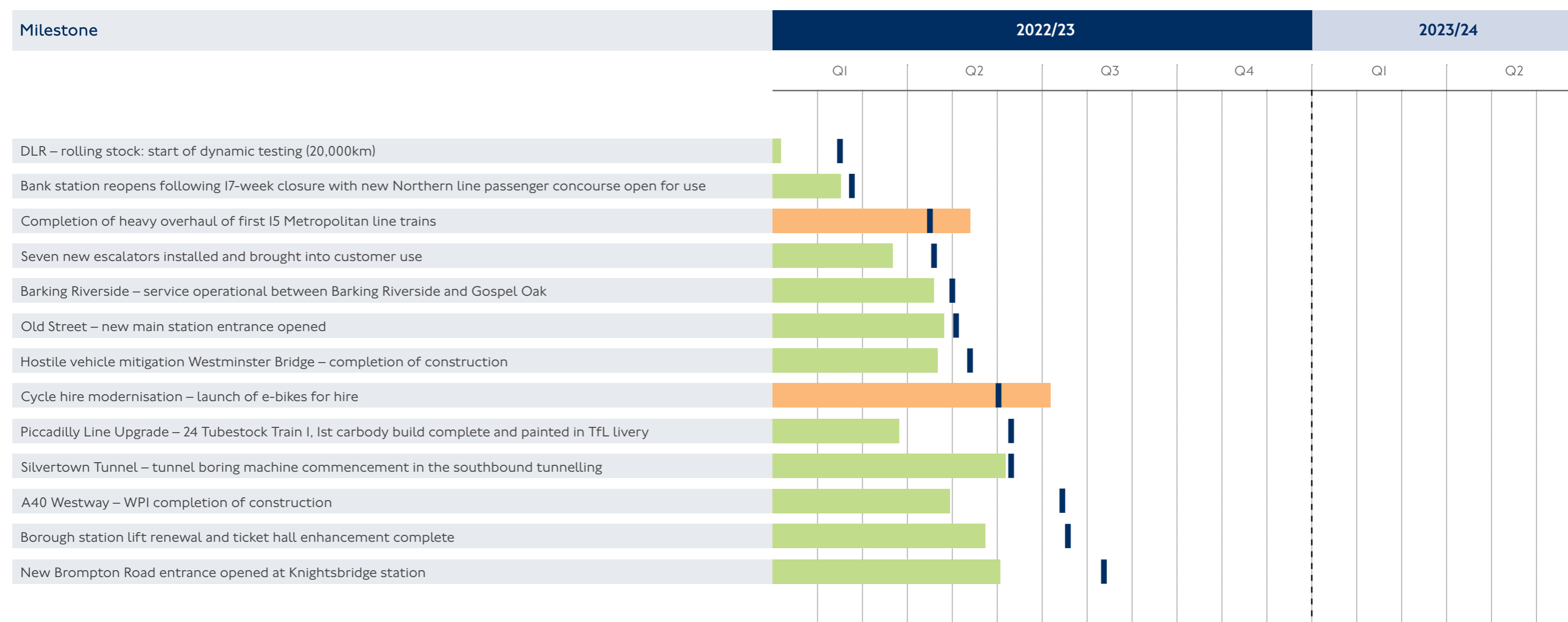


The Barking Riverside extension has enhanced connectivity in east London

# Strategic milestones

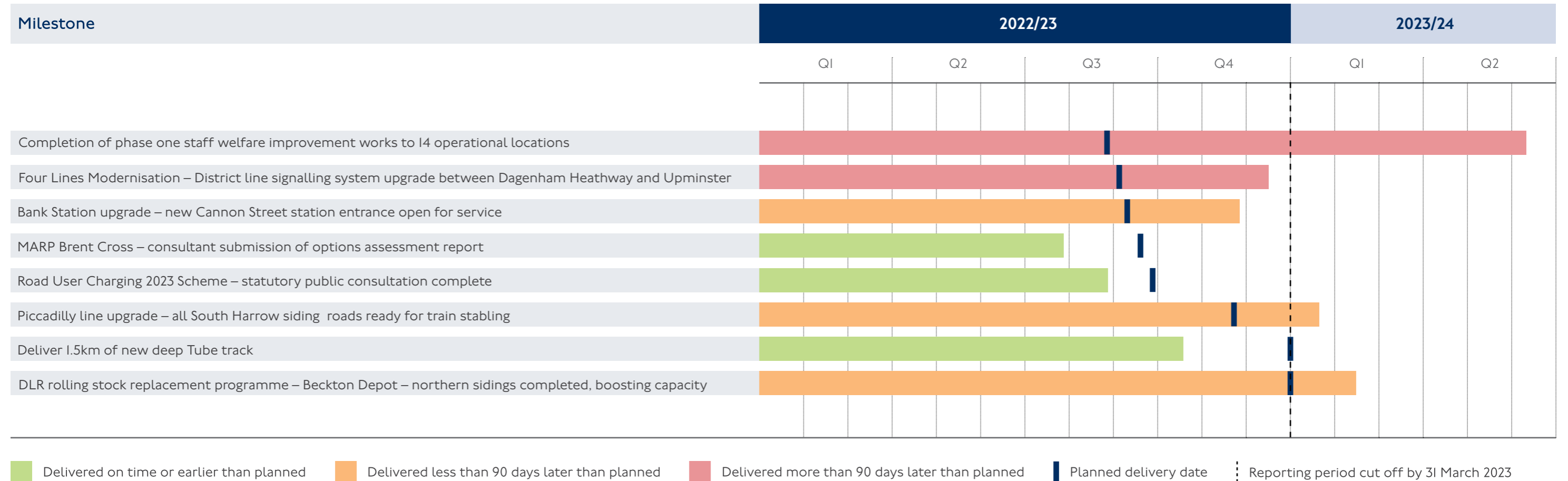
We have delivered 18 out of 21 strategic milestones either on time or early this year

These are our strategic milestones for 2022/23. The solid blue bar shows when the milestone was due to be met, while the green, amber or red coloured block shows 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 2023

## Strategic milestones 2022/23 (continued)



# Milestones forecast to be late

## **DLR rolling stock replacement programme**

**Beckton Depot – Northern Sidings completed to provide additional train capacity**

The works have been delayed due to the late production and submission of the design, and underperforming site activities. These delays were further compounded by having to reschedule the weekend possession from May to July 2023.

## **Piccadilly line upgrade**

**All South Harrow siding roads ready for train stabling**

All South Harrow siding roads were successfully brought into use on 22 May. The roads were originally scheduled to be brought into use in February but inclement weather impacted ground conditions, delaying the track and civils work and installation of other related assets.

## **London Underground – Infrastructure renewals – Built environment and civils** **Completion of phase one staff welfare improvement works**

The staff welfare improvement project is ongoing, with site works mobilised at several locations. However, a range of issues have affected progress, including poor contractor mobilisation and performance, existing asset condition and discovery of hazardous materials. This has required additional unplanned works and resulted in significant delays to the programme. This means the forecast completion date is late and unrecoverable against the milestone date.

## **London Underground – Train systems – Passenger fleet**

**Completion of heavy overhaul of the first 15 Metropolitan line trains**

The project delivery timescales were delayed due to the slower than expected ramp up of bogie production. This was in turn due to delays in delivery of materials from suppliers and development and approval of work instructions. The production rate was subsequently improved, with the final train being completed on 12 August, 28 days later than the target date.



We are continuing a major overhaul of our Metropolitan line fleet

# Major projects

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



# 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	1,000	7	1,007	1,149	142
<b>Change since last Investment programme report</b>					
No change	4	(3)	1	No change	

### Financial commentary

The movement of £4m in the cost to date since the last report relates to ongoing rolling stock work that will be completed in December 2024.

### Performance over time commentary

The forecast end date represents the delivery of the rolling stock and depot, including all additional changes. Since the authority award in 2013/14, our forecast end date has been delayed owing to delays to the overall Crossrail programme. Our authority increased in 2018/19 when five units were added. Since the authority was awarded in 2013/14, the EFC has dropped from £1,090m to £1,007m because the trains have since become part of a sale and leaseback arrangement. They are now being leased from 345 Rail Leasing Limited and the costs charged as operational costs.

### Programme update

#### Class 345 trains

Up to 61 nine-car Class 345 trains continued to operate the Elizabeth line services in Quarter 4 with a peak service of 22 trains per hour in the central section (Paddington

to Whitechapel). On 21 May 2023, a new Elizabeth line timetable was introduced which increased the peak service to 24 trains per hour, using 65 Class 345 trains.

The manufacturers continue to apply incremental updates to the train and signalling system software, and we have provided for this in the rolling stock project forecast through to 2025.

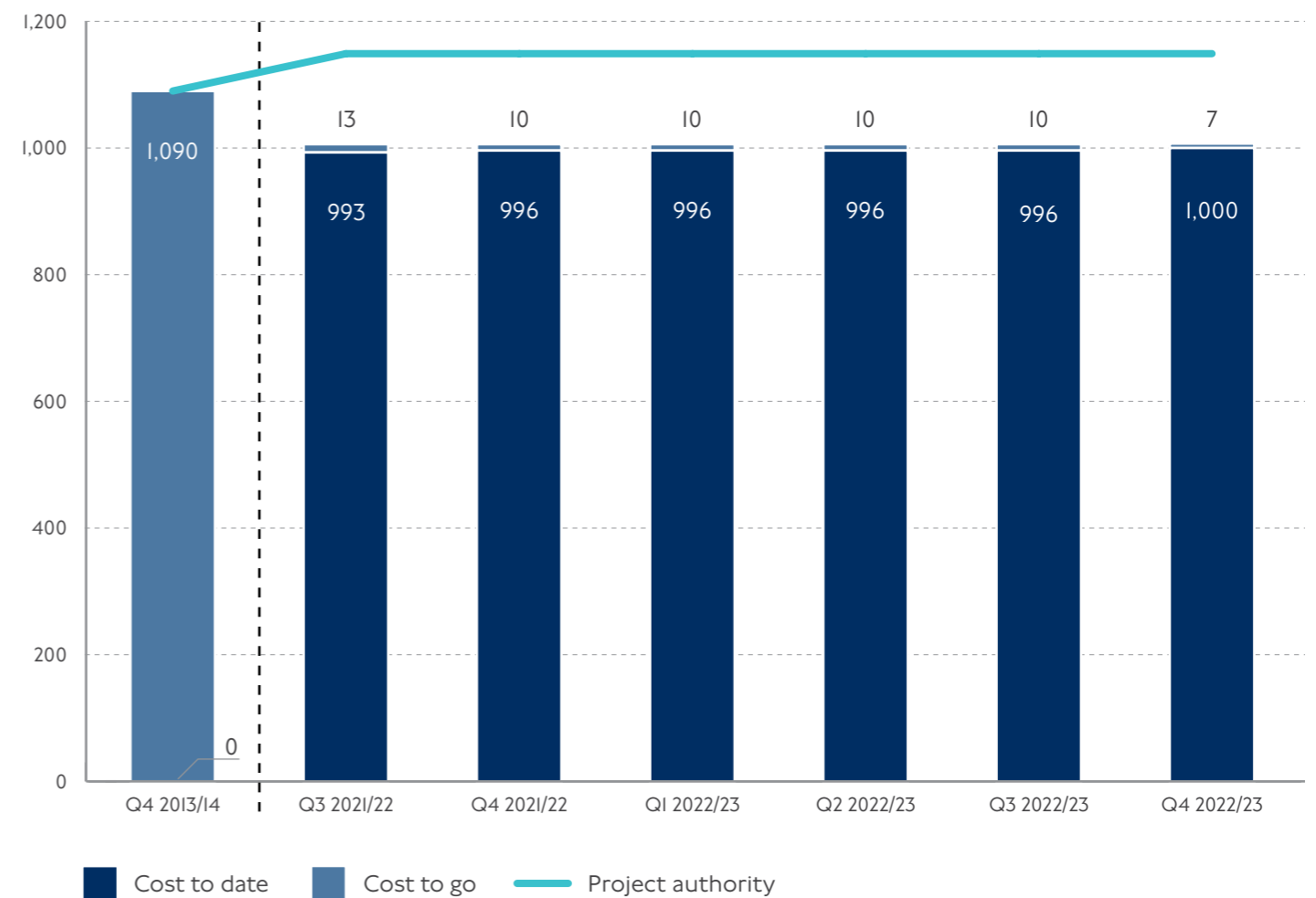
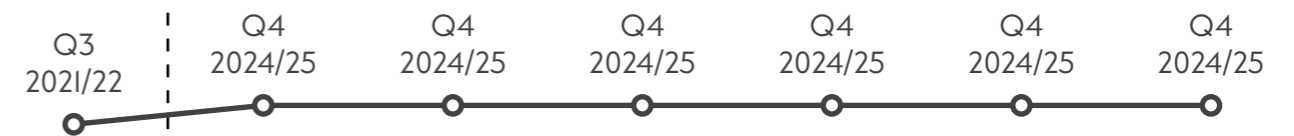
### Challenges

Fleet reliability has recovered from the more onerous train duty cycle that was introduced with through-running between the eastern and western and central sections of the Elizabeth line in Quarter 3 (Stage 5b).

Alstom, the train manufacturer, continued to apply modifications to the fleet (hardware and train control software) in Quarter 4 to improve fleet reliability in readiness for the increased duty cycle which came with the introduction of the new timetable on 21 May 2023. Alstom has a continuing modification programme to attain further necessary reliability increases.

### Estimated final cost performance over time (£m)

#### Forecast completion date



# Crossrail

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)
Q1 2023/24	15,797	106	15,903	15,888*	(15)
Change since last Investment programme report					
No change	16	(44)	(28)	No change	

## Financial commentary

In Quarter 4, the EFC reduced to £15,903m, £28m lower than the Quarter 3 forecast, driven by a detailed review of remaining provisions required for completion. The programme achieved end-to-end integration with Stage 5c, increasing peak service to 24 trains per hour on 21 May 2023, following the recent successful commissioning of ELR400 signalling software and CMS 33.X software in April 2023.

The £106m cost to go represents all works that were required to achieve end-to-end integration and other residual work items required due to safety, reliability or performance improvements.

Crossrail continues to be focused on managing the risks associated with implementing the additional functionality required to complete the final integration of the railway, alongside achieving the required level of operational resilience.

## Performance over time commentary

Crossrail opened the Elizabeth line in May 2022 and Bond Street in October 2022. The reported forecast end date represents operation of the full peak timetable. At this point the peak time frequency increased from 22 to 24 trains per hour between Paddington and Whitechapel, with 16 trains per hour off-peak. Direct services from Shenfield to Heathrow Airport also began. Several opportunities and risk retirements have been identified, reducing the programme EFC to £15,903m, a £60m reduction since Quarter 1.

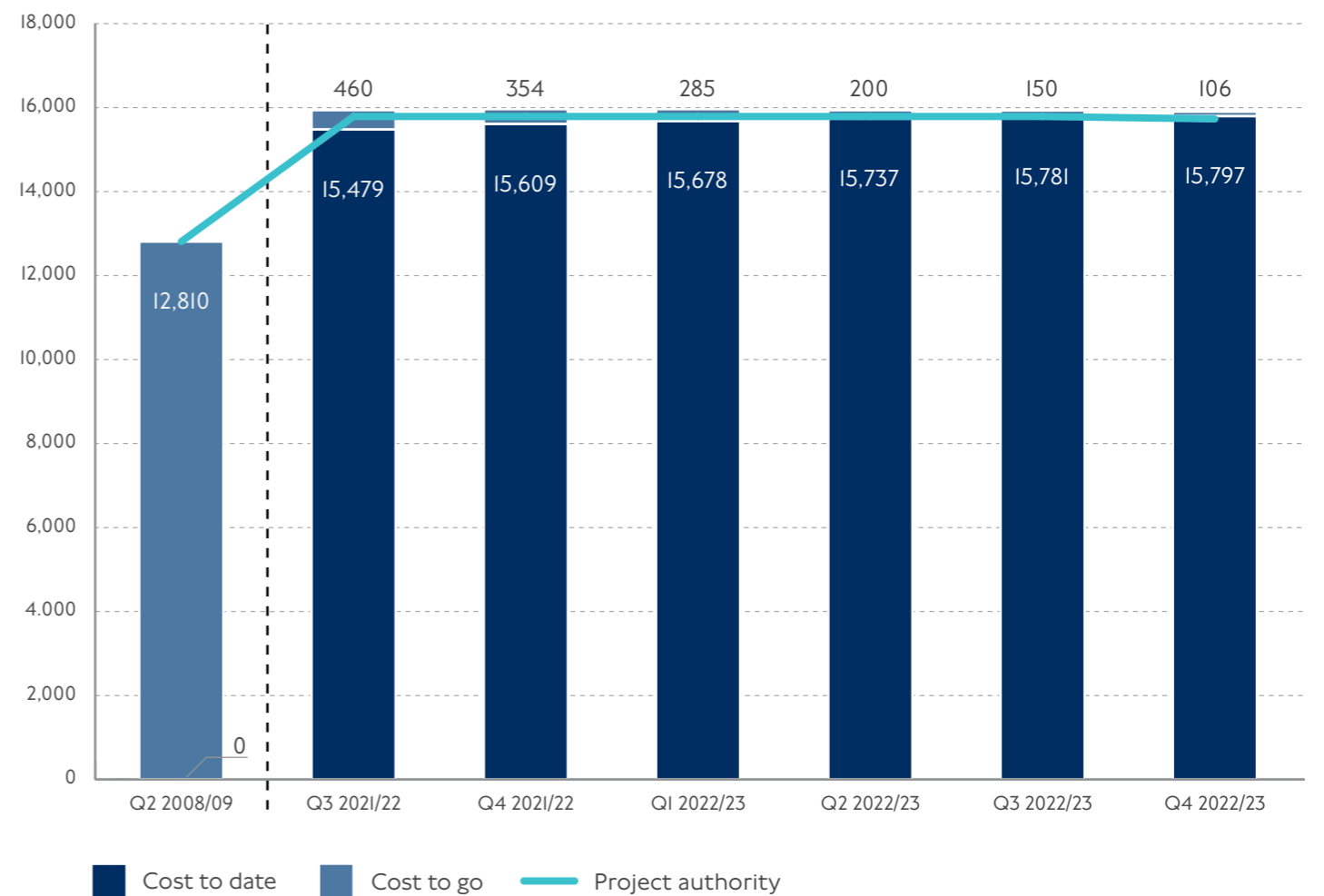
## Programme update

The latest Elizabeth line timetable was introduced on Sunday 21 May 2023. This timetable change sees the railway move to a peak service of 24 trains per hour in the central section, an increase from the current 22 trains per hour, and also increases connectivity and reduces journey times. The introduction of this timetable change marked the end of the Crossrail project. The project closed on 26 May 2023, with the team closing out or transitioning activities to TfL and declaring final completion for endorsement by the sponsors.

\* Excludes on-network works carried out by Network Rail

## 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)
Q4 2024/25	5,258	211	5,469	5,520	51
Change since last Investment programme report					
No change	33	(37)	(4)	No change	

### Financial commentary

In Quarter 4, the EFC reduced by £4m compared to Quarter 3. This is due to the inclusion of a cost reduction and efficiency target set as part of the budgeting process. The project team are currently undertaking a deep-dive review of the costs and schedule (also accommodating the delivery into service of signal migration areas SMA6 and SMA7). This review will inform the detailed Four Lines Modernisation programme annual review submission to the Programme and Investment Committee in July 2023. Our forecast completion date, for when the final signal migration area I4, between Rayners Lane and Uxbridge, will be brought into service, remained at Quarter 4 2024/25.

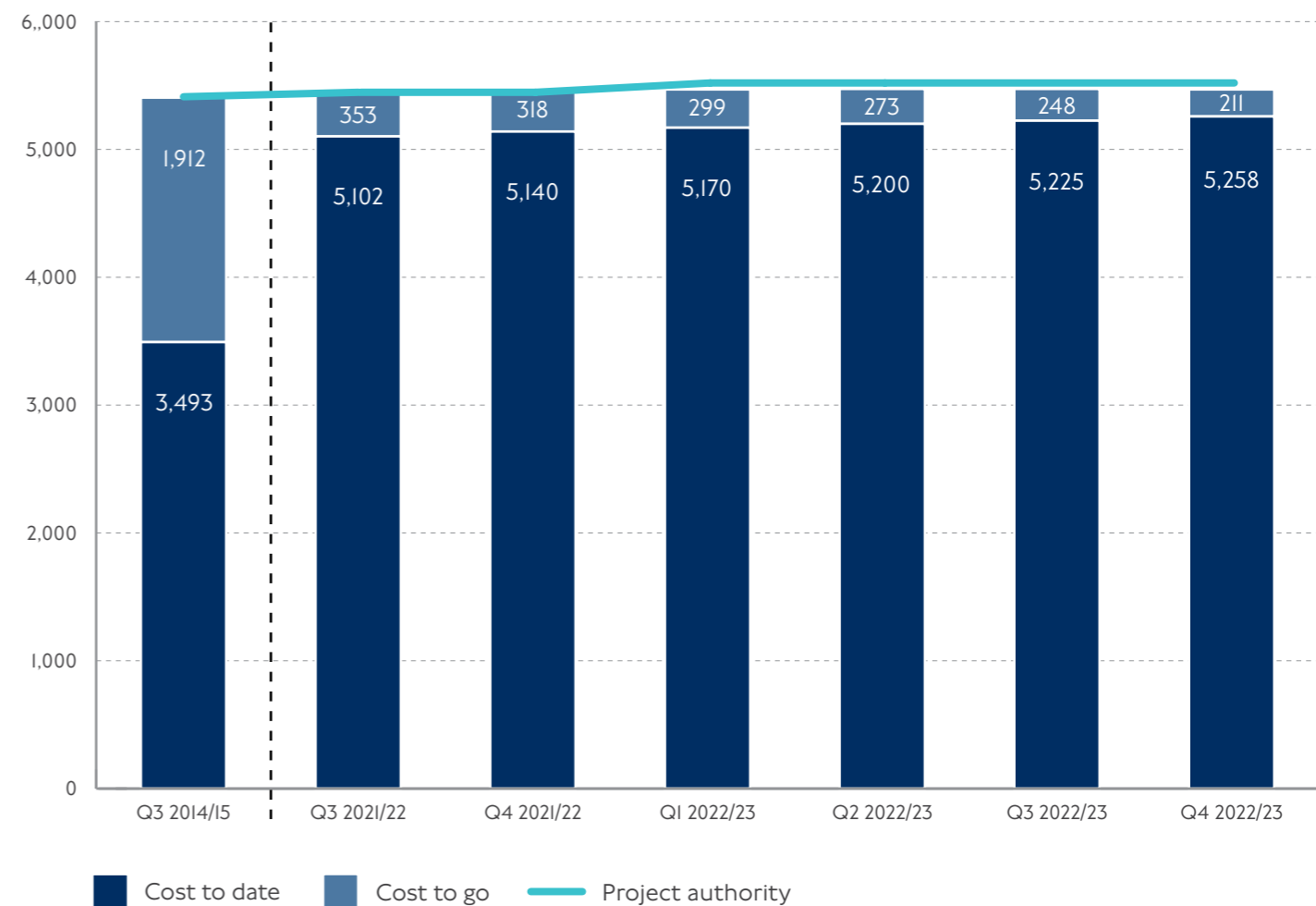
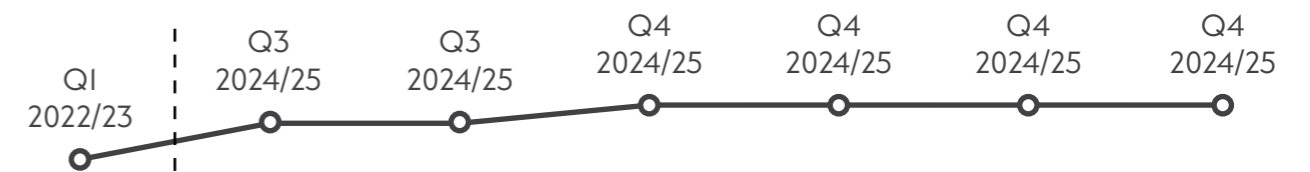
### Performance over time commentary

The forecast completion date shows when the final signal migration area I4, between Rayners Lane and Uxbridge, will be brought into service.

Our forecast completion date for signal migration area I4 has been delayed since the signalling contract was awarded in 2015. This is principally owing to challenges with complex software development, testing and commissioning, closure availability and the impact of the coronavirus pandemic.

### Estimated final cost performance over time (£m)

#### Forecast completion date







Over 57 per cent of the Tube network now has automatic signalling

### Programme update

We continue to make progress on the programme, which is delivered by progressively installing new signalling on sections of the railway called signal migration areas (SMAs).

Following our successful commissioning of the signalling section between Stepney Green and Becontree (SMA6) on 15 January 2023, the signalling section between Becontree and Upminster Depot (SMA7), went live on 19 March 2023. This is another significant achievement for the programme as it extends the roll-out of the new signalling system on the majority of the District line, completes automatic running on the east of the railway, and connects the first depot to the network.

The area now operating under the new signalling contains 62 stations and four complex junctions, including the full Circle and Hammersmith & City lines. For comparison, the Jubilee line has 27 stations. This means two of the four sub-surface lines (and around 57 per cent of the total Tube network) are now operated by an automatic signalling system.

Unrelated to the commissioning of SMA7, we have identified two significant software issues which are currently being mitigated through additional operational restrictions. The impact of resolving these issues has been assessed and a plan is now in place to address these prior to implementation of the Finchley Road to Preston Road signalling section (SMA8).

Our focus is now moving to software development for future SMAs covering the Metropolitan line north of Finchley Road. Over the Easter weekend (7 to 10 April) we undertook successful testing of the new signalling for SMA8.

Design and installation of trackside signalling assets continues on the Uxbridge (SMA14) and Amersham, Chesham and Watford (SMA13) branches of the Metropolitan line in addition to SMA9 between Preston Road and Moor Park, including Harrow-on-the-Hill. The procurement is in progress for the planned upgrades to the heavy lifting shed at Neasden depot and the new staff accommodation block. When complete in 2024, this facility will enable the planned overhaul of Metropolitan line trains.

## Line upgrades

# DLR rolling stock and systems integration

(includes Housing Infrastructure Fund)

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)
Q2 2026/27	315	537	852	881	29
<b>Change since last Investment programme report</b>					
No change	66	(71)	(5)	No change	

### Financial commentary

Since the last report, the EFC has reduced due to savings achieved by using existing facilities in the depot to assemble the early trains, contributing to reducing the scope of the temporary fit out shed. EFC continues to be below authority due to reducing the scope of the Housing Infrastructure Fund from 14 to 11 trains. We continue to review options to mitigate and offset inflationary pressures where possible.

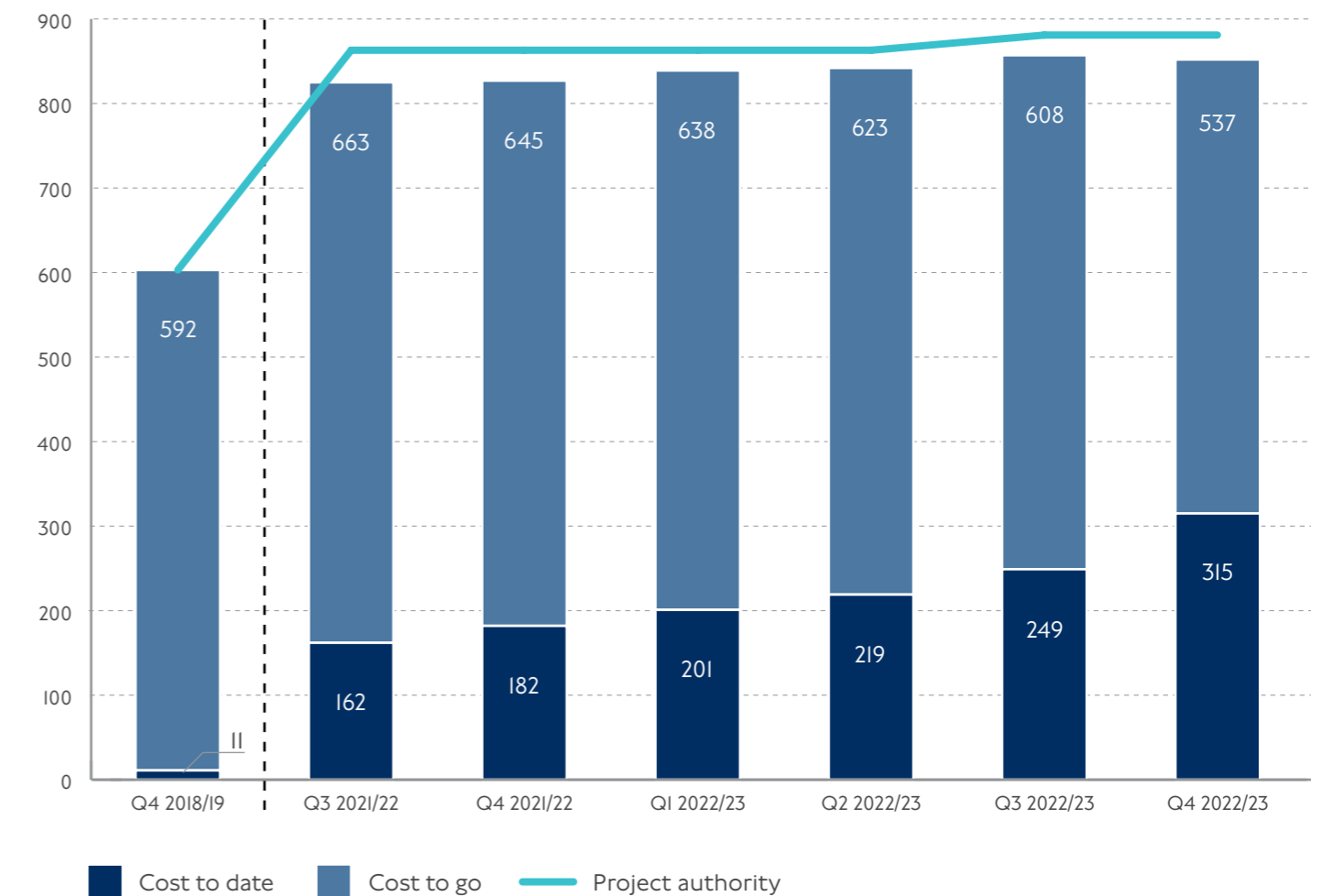
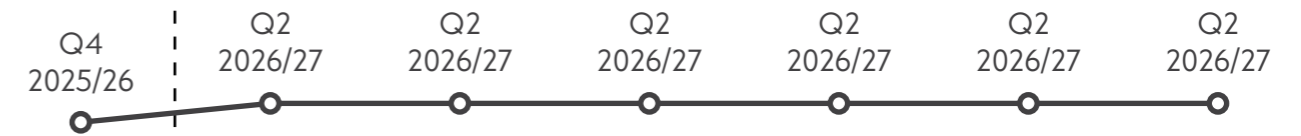
### Performance over time commentary

Since the original grant of programme and project authority in 2019, we have received approval from the Government to activate an option to purchase 11 additional trains funded through the Housing Infrastructure Fund. The increase in EFC from Quarter 4 2018/2019 reflects the addition of £261m of grant funding from the Government to deliver the Housing Infrastructure Fund scope of works.

We reduced our EFC to reflect procurement savings and by taking a proactive stance on the remaining risk exposure as the rolling stock design approached completion. However, this is offset by countervailing inflationary pressures during 2022.

### Estimated final cost performance over time (£m)

#### Forecast completion date



## Programme update

### Rolling stock delivery

The manufacture of the new rolling stock in Spain is continuing to plan with 11 trains completed. The second new rolling stock train was delivered to Beckton depot in early March 2023, while the first train delivered is now undergoing testing on the DLR Network during engineering hours.

We completed signalling testing of the new software on the DLR network with the existing fleet in preparation for the arrival of the new trains in early 2023. Following this, we successfully completed the first stage of signalling integration testing in April with the new train running under automatic signalling control.

### Beckton depot and network infrastructure

At Beckton, critical works to complete the northern sidings works are under way with possessions to bring the sidings into use planned for August 2023.

The improvements at Beckton Depot are an integral part of the new DLR train programme. Improved maintenance facilities ensure a continued reliable service for customers.

Following the award of the contract for the maintenance facility building and southern sidings our contractor has now mobilised to site. We have awarded the contract for the design and build for a second entrance at Blackwall station which is essential for unlocking the full fleet roll-out.

These new, state-of-the-art trains will feature a walk-through design, the latest audio and visual live travel information, air conditioning and mobile device charging points. Thirty-three of the new trains will replace some of the oldest rolling stock, which is more than 30 years old and coming to the end of its design life, while 21 additional trains will boost capacity across the DLR network.

### Housing Infrastructure Funding

We have received confirmation from the Government to activate an option to purchase 11 additional trains funded through the Housing Infrastructure Fund. This will provide additional capacity and unlock further housing benefits in the Royal Docks and Isle of Dogs. Negotiation for the additional trains is now complete.



We are ahead of schedule with testing of our new DLR rolling stock

## 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	656	2,256	2,912	2,994	82
<b>Change since last Investment programme report</b>					
No change	74	(73)	1	No change	

### Financial commentary

Since the last report, our EFC has increased by approximately £1m which is primarily due to continuous assessment of the risks as the programme matures. The EFC is currently £82m lower than the programme and project authority and is under review to assess the cost impact of required changes to our depots' migration plan, which is set out in the following commentary.

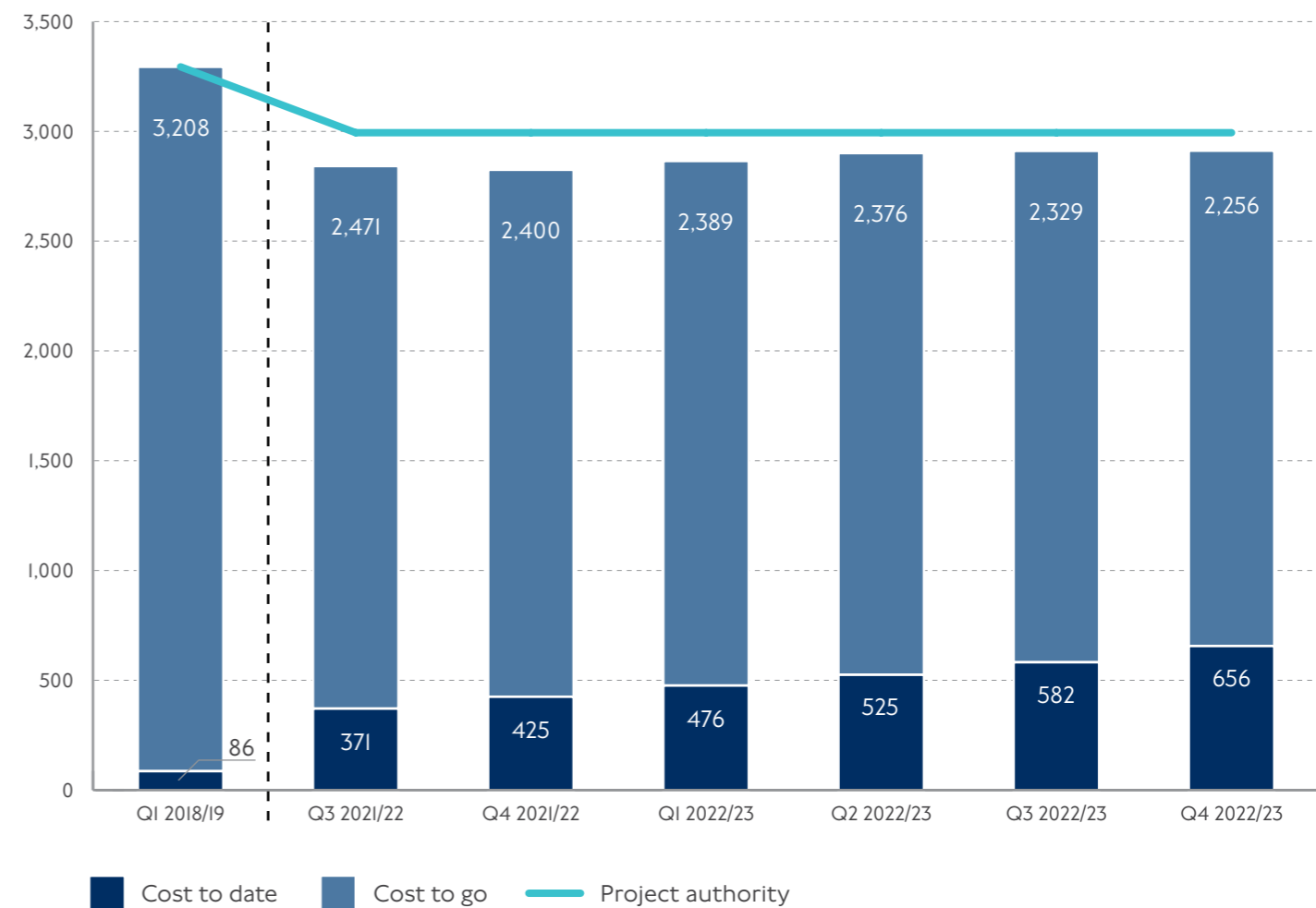
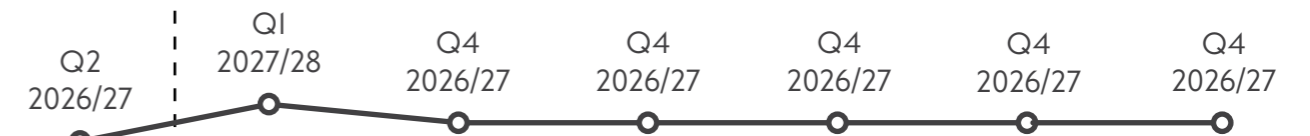
### Performance over time commentary

The forecast end date reflects when the new Piccadilly line trains and all supporting infrastructure will be in operational use. Since authority was originally awarded in May 2018, our forecast end date has been delayed from 2026 to 2027.

Since July 2021, industry price increases have led to updated inflation indices within our business, adding around £70m to the overall EFC. This is currently being contained within the overall programme and project authority through an ongoing focus on value management and value engineering opportunities.

### Estimated final cost performance over time (£m)

#### Forecast completion date





We are on track to deliver our new Piccadilly line rolling stock

### Programme update

#### Rolling stock

In January 2023, Siemens Mobility completed all works at the test track in Wildenrath in Germany, including installation of third and fourth rail power upgrades and building of a platform for one-person operation. Testing will start on the track to ensure all upgrades are functioning correctly ahead of the first train arriving there for dynamic testing in the summer.

In March 2023, Siemens completed the first-in-type driving motor car body shell. The car body is now ready to enter the painting process. This keeps us on target for the first train to be completed and transferred to the test centre in Wildenrath to start commissioning tests this autumn.

#### One-person operation CCTV

In February we delivered 22 of 44 power connections in the communication equipment room, a significant step towards enabling train and platform CCTV to be installed. This marks the completion of 50 per cent of planned installations. Once completed, this work will enable the one-person operation and off-train communications equipment to be installed. One-person operation CCTV is a safety-related system that allows the train operator to view passengers along the platform at the interface with the train.

#### High voltage power upgrade

In March, enabling works started in the Northfields sub-station as part of the high-voltage power upgrade. The upgrade of Northfields sub-station is critical, not just for the future roll-out of the new trains, but also to support the increased power demand because of the ongoing upgrade to Northfields depot.

#### Depots

Enabling works continue at Northfields and Cockfosters depots to prepare for the start of major upgrades to provide maintenance facilities for the new trains.

As outlined in the last report, the depots' concept designs had to be updated as the original wheel lathe design could not be delivered. The programme delays from this have caused knock-on impacts to the depots' migration plans with these now misaligned to the train introduction dates and migration strategy. The team is continuing to explore ways to mitigate this issue and the resultant schedule and cost impacts.

#### Green agenda

The project team has set key performance indicators across the programme focusing on reducing carbon, the values of which are reported. Top carbon risks and opportunities are reported in our internal programme performance report. Objectives have been set for all staff to attend carbon-literacy training courses to support the delivery of carbon savings within the programme. Work continues on revising the baseline to reflect a developing understanding of the programme.

# 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)
Q1 2025/26	113	64	177	173	(4)
Change since last Investment programme report					
No change	34	(43)	(9)	No change	

### Financial commentary

The EFC is currently £4m over the approved programme and project authority of £173m, owing to inflation increases and the agreed Safe Stop undertaken because of the coronavirus pandemic. The EFC reduced by around £9m since the last report due to an overall reduction in risk exposure. We continue to seek opportunities to reduce cost and risk exposure further.

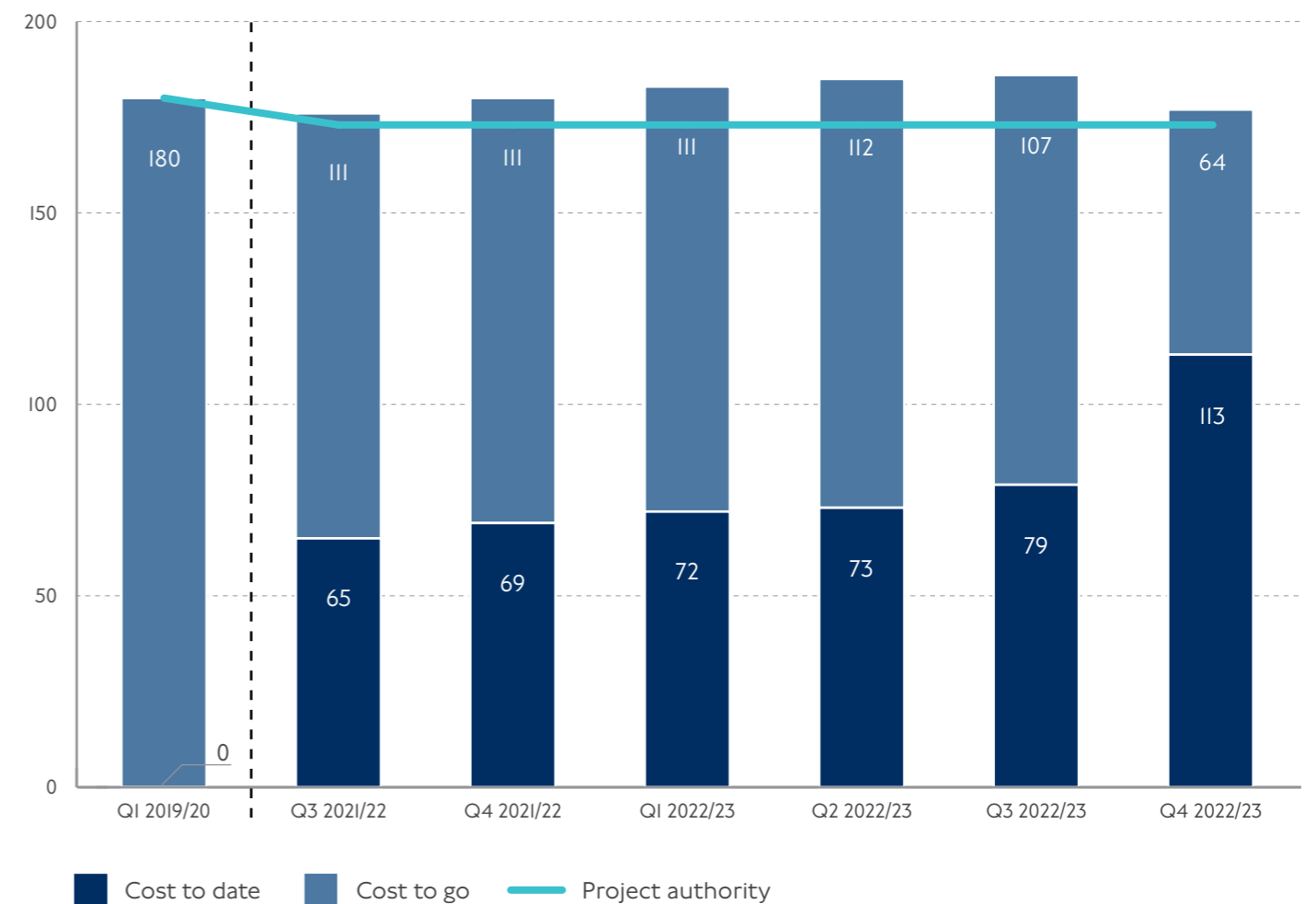
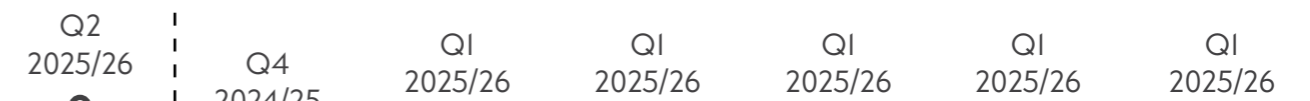
### Performance over time commentary

The forecast end date is when the permit from an independent assessor to use the new Silvertown Tunnel is obtained. There has been no change to the forecast end date in the last year.

The EFC reduced in Quarter I 2021/22 after the scope and budget were transferred to the Road User Charging portfolio to achieve synergies with our other Road User Charging schemes; but rose again through 2022 following the impacts of inflationary pressures. As described in the financial commentary, it has reduced in the quarter following risk release.

### Estimated final cost performance over time (£m)

#### Forecast completion date



All numbers are shown as net of income and third-party contributions

### Programme update

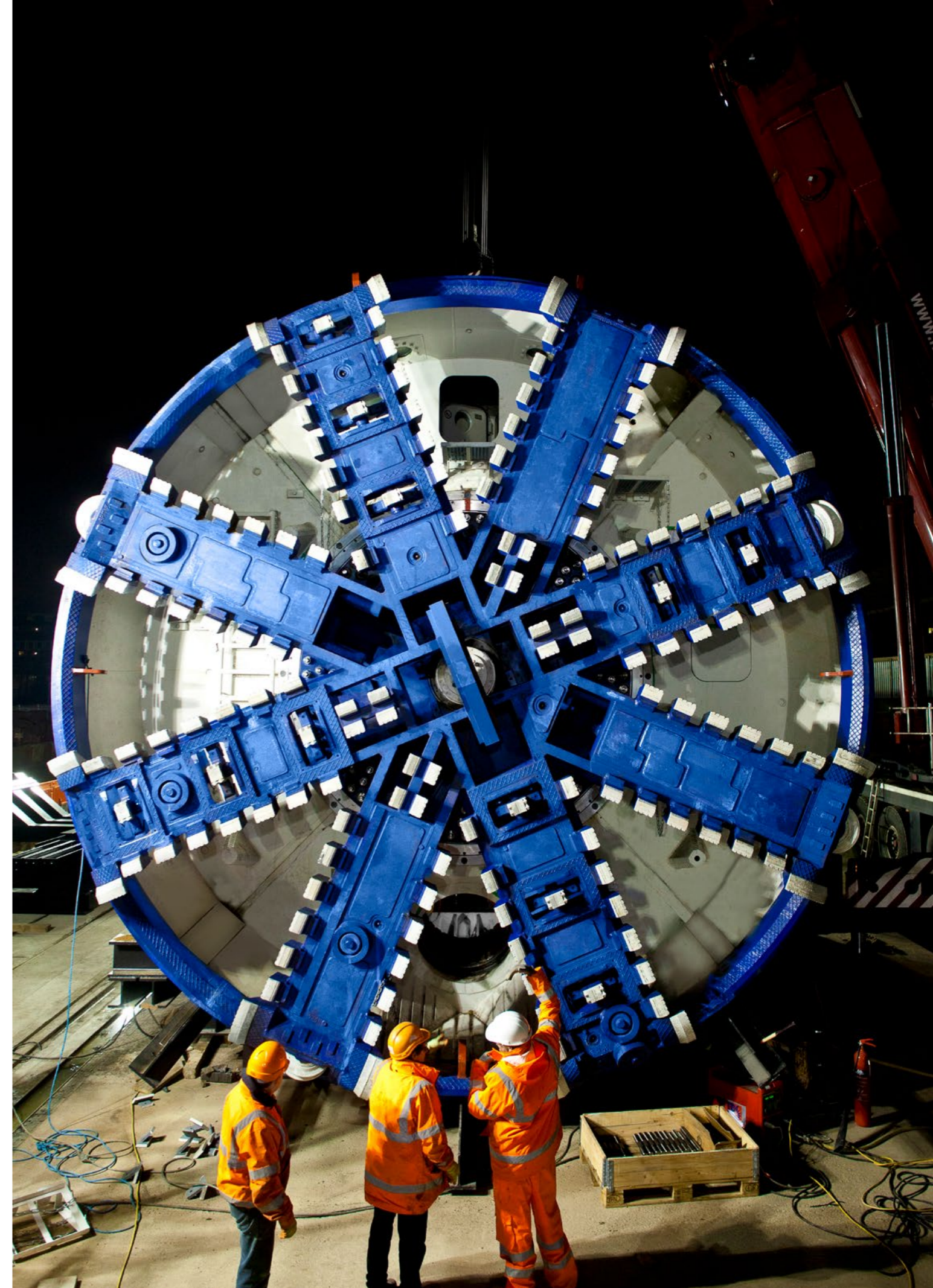
The tunnel boring machine (TBM) reached the rotation chamber in Greenwich on 15 February 2023, completing the tunnelling of the first bore, which was a significant milestone for the project. The TBM has been successfully manoeuvred into position for the northbound drive and started the final leg of its journey on 23 May. This is a significant achievement for the programme as it represents successful completion of one of the most complex TBM manoeuvres undertaken.

Construction has commenced on the new walking and cycling bridge across the A102, the southern approach road for both the new Silvertown Tunnel and the Blackwall Tunnel. This will replace the existing 1960s footbridge with a new, fully accessible bridge built to modern design standards with improved lighting. The new bridge will provide a safe and easily accessible crossing for those walking and cycling, including those using cargo bikes, on the Greenwich Peninsula and to accommodate future neighbouring development proposals. The main span of the new bridge was installed in March, and the existing bridge will be kept in use until the new bridge is fully opened.

### Green agenda

Riverlinx, our construction partners on this project, have so far saved 690 tonnes of carbon dioxide by using river transport for delivery of materials and removal of waste. This equates to 40,368 heavy goods vehicle movements being removed from local roads.

The introductory cross-river bus network for Silvertown Tunnel was finalised in March 2023. The network includes routes 108 (existing service using Blackwall Tunnel), 129 and X239; they 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.



Boring of the northbound Silvertown Tunnel is in progress

## Network extensions

# Barking Riverside Extension

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)
Q2 2022/23	332	(5)	327	329	2
<b>Change since last Investment programme report</b>					
No change	3	(4)	(1)	No change	

### Financial commentary

There have been minor changes to the EFC which continues to remain stable since the last report. The negative cost-to-go values are driven by future opportunities that are expected to materialise throughout 2023.

### Performance over time commentary

Our forecast end date for when services will run between Gospel Oak and Barking Riverside has been delayed since the programme and project authority was approved in 2018, following the discovery of uncharted utilities and the Safe Stop because of the coronavirus pandemic. The Safe Stop resulted in rail systems works being replanned and Network Rail possessions rebooked, with the EFC increasing because there are only two opportunities a year for a four-day possession. Additional works were required to resolve concerns over signal sighting, which impacted the completion of the scope and main contract.

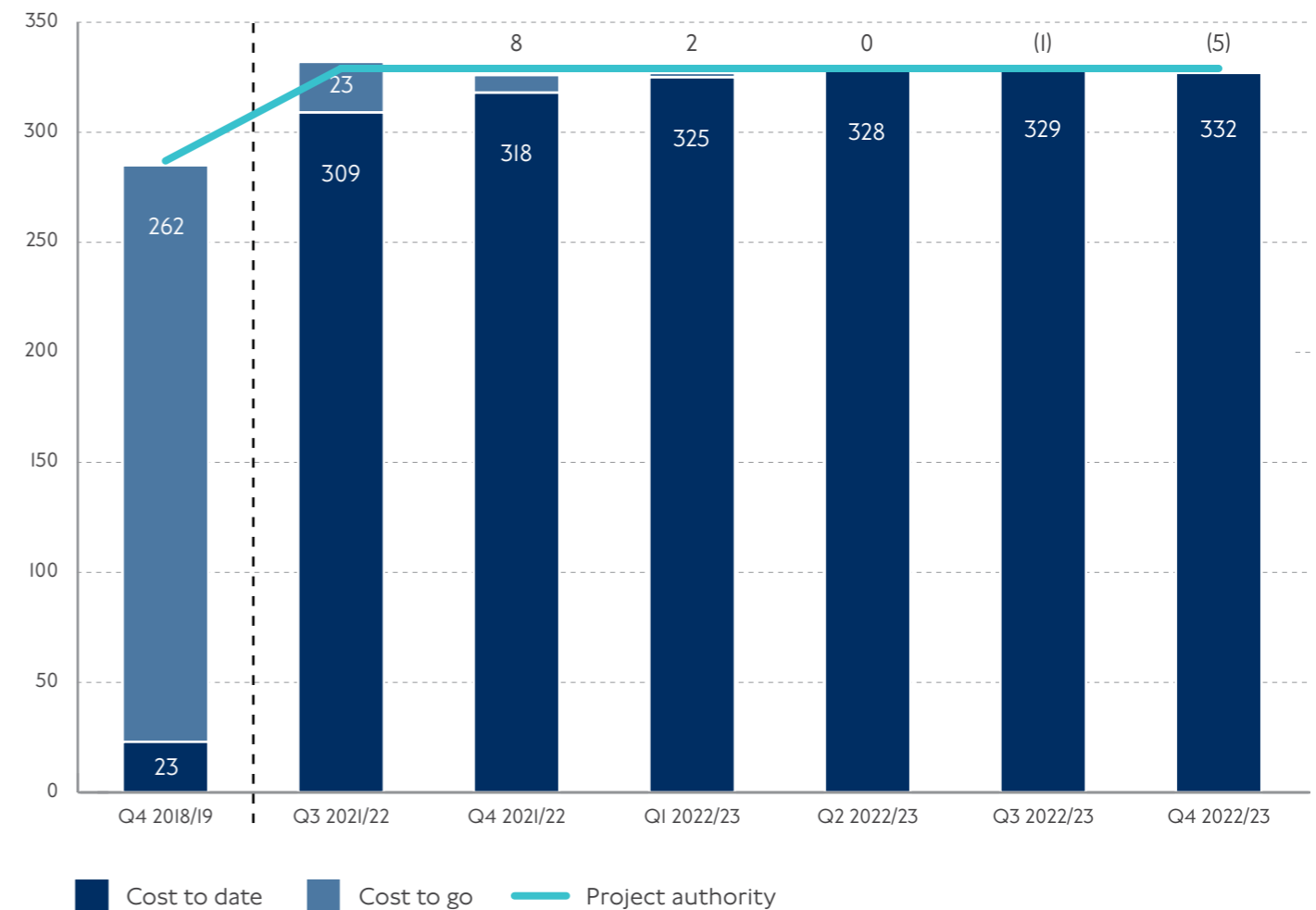
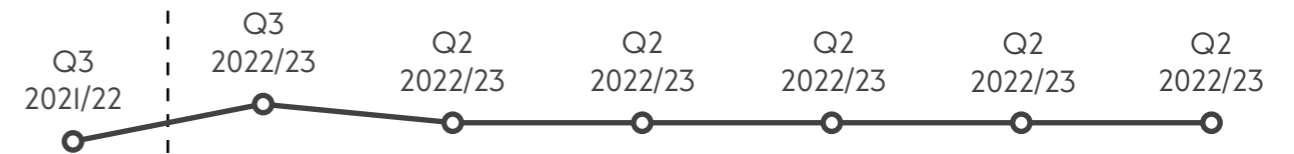
### Programme update

The new extension between Gospel Oak and Barking Riverside opened on 18 July 2022 and has been running a good service.

Signal assets have now been transferred to Network Rail (NR) following the commissioning of the banner repeater signal in January 2023.

### Estimated final cost performance over time (£m)

#### Forecast completion date





# Major station upgrades

## 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 2022/23	690	12	702	702	—
Change since last Investment programme report					
No change	4	(4)	No change	No change	

### Financial commentary

The EFC has remained stable since the last report and spend is in line with current forecasts. The opening of the Cannon Street station entrance was delayed from December 2022 to February 2023, due to issues relating to manufacture and installation of cladding panels and commissioning of safety-critical systems. The Cannon Street entrance was formally opened by the Mayor of London on 27 February. Final snagging and close-out works are being completed following the successful opening.

### Performance over time commentary

The forecast end date represents the opening of the new Cannon Street ticket hall entrance at Bank station, which was achieved on 27 February 2023. Our estimated final cost has increased since the authority award in 2016, owing 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 coronavirus pandemic. In addition, the final phase of the programme was delayed by around three months due to issues

relating to manufacture and installation of cladding panels and commissioning of safety-critical systems.

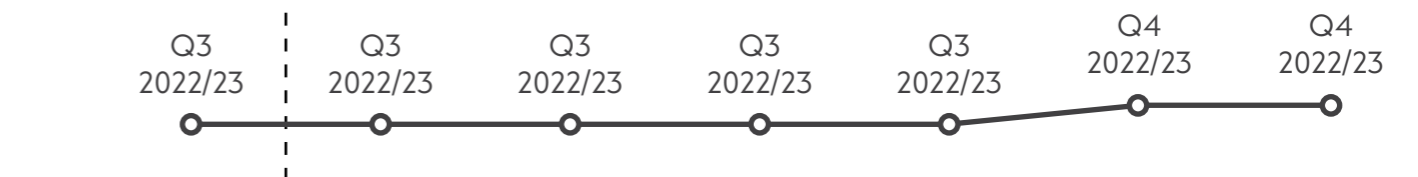
### Programme update

This project increases the station's capacity by approximately 40 per cent. It has also resulted in improved passenger flows, reduced journey times and enhances 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 to serve the Northern line and DLR. There are more direct routes within the station and a new station entrance on Cannon Street.

The new street-level entrance on Cannon Street was officially opened by the Mayor of London on 27 February 2023. This includes six further escalators between street level and Northern line platform level, step-free access between street level and the Northern line platforms for the first time and improved step-free access to and from the DLR via new lifts. This completes the transformation of Bank which is a significant milestone.

### Estimated final cost performance over time (£m)

#### Forecast completion date



# Elephant & Castle

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 2027/28	23	63	86	87	1
<b>Change since last Investment programme report</b>					
No change	3	(4)	(1)	No change	

## Financial commentary

Since the last report, the EFC has remained largely stable, with a small decrease due to permanent power supply works no longer required as part of stage 1 works (station box and tunnelling works). This scope has now been moved to the stage 2 works (station fit-out) which are currently unfunded. Variance in cost to go is mainly attributed to third-party funding reported in 2022/23.

## Performance over time commentary

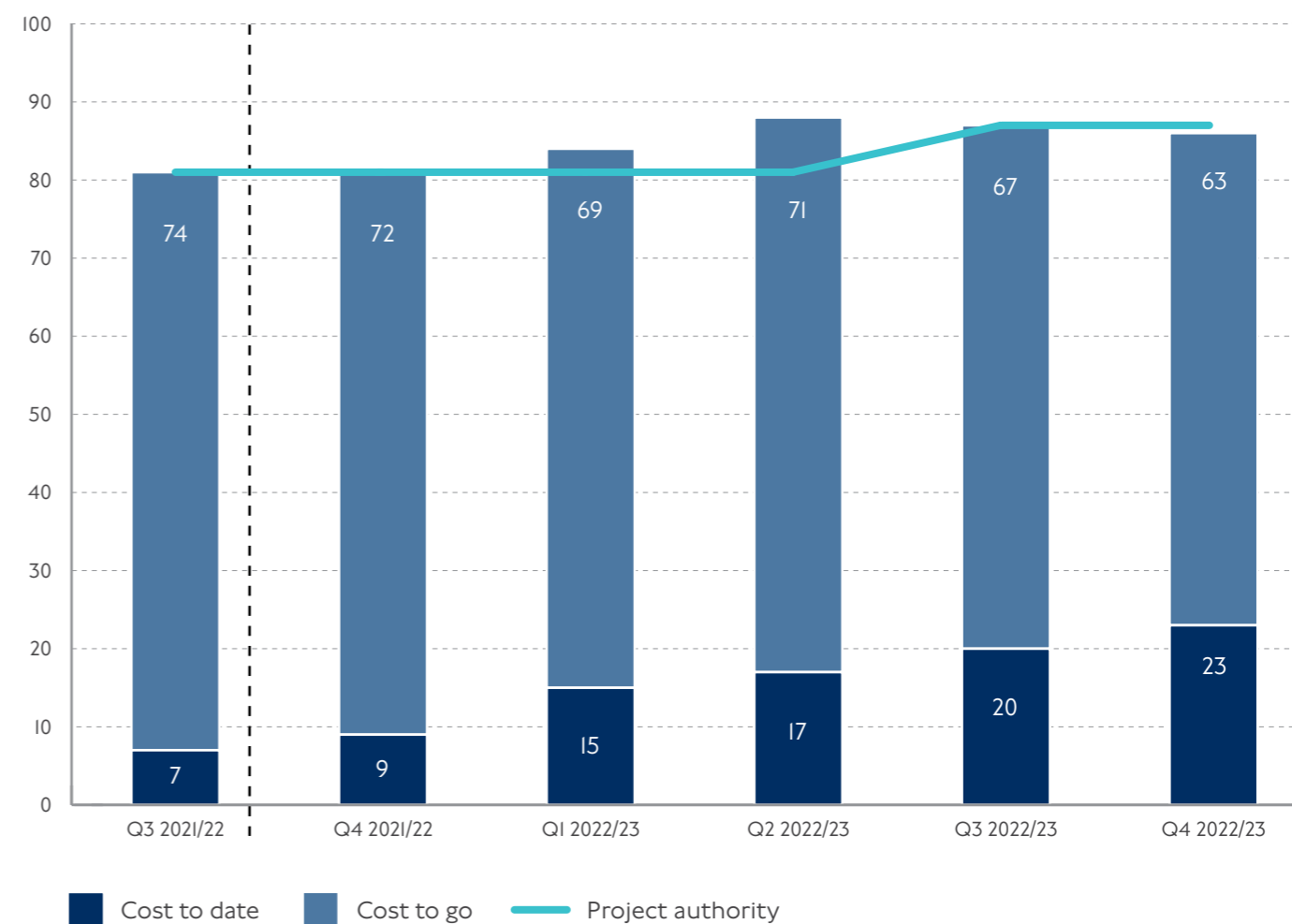
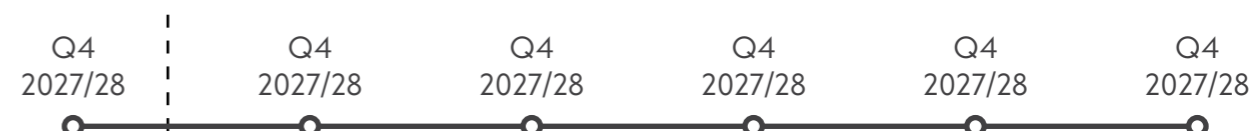
The completion of station tunnelling works is forecasted to be completed in February 2028, which remains unchanged.

During 2022/2023, the project EFC increased owing to the impact of inflationary pressures. In October, the Programmes and Investment Committee approved an increase of £5.5m to authority to cover the inflationary increase and bring forward scope from stage 2 to lower the risk of future communication works.

Subsequently, the project team has further analysed the benefits and have determined better value can be achieved by deferring some of this scope back to later years (stage 2). Effective change control has aligned latest budgets with this revised approach. The EFC will continue to be challenged and we have engaged the construction market much earlier than is the norm, providing suppliers with more time to identify opportunities in a competitive market.

## Estimated final cost performance over time (£m)

### Forecast completion date



### Programme update

We are progressing with the procurement arrangements for the new tunnels, with an invitation to tender scheduled for June 2023. A contract for essential pre-tunnelling ancillary works was tendered, responses were analysed and the contract was awarded in May 2023. All of these works, plus the station box, are known as stage 1 works and are fully third-party funded. However, stage 2 works covering the station box fit-out are currently unfunded.

Construction of the station box by the developer continues apace, with station box piling completed. Station box handover by the developer remains as planned in early 2025.

To support the procurement of the tunnelling works contract, an additional package of works has recently commenced to undertake additional ground investigation in the area around Newington Butts. Our close co-operation with the developer has led to them sharing their ground investigation results and this work will add to their findings.

Additionally, we have progressed the procurement of a package of work to determine options for the eventual fit-out of the station box and tunnels and bringing the new station entrance into use (stage 2 works). Invitations to tender were issued in October 2022 and the contract was awarded to Arcadis in January 2023. Arcadis has produced the first draft report for consideration before pricing by Currie & Brown, who are acting as an independent cost estimator.



Work is progressing on our Elephant & Castle upgrade programme

# High Speed 2

Forecast completion	Cost to date (£m)	Cost to go (£m)	EFC (£m)	Programme and project authority (£m)	Variance: EFC versus authority (£m)
Q2 2033/34	31	38	69	34	(35)
<b>Change since last Investment programme report</b>					
No change	3	(3)	No change	No change	

## Financial commentary

Programme and project authority is £35m lower than EFC, as it is granted on an annual basis for the following year's spend. Approval of the authority for the next financial year is planned for summer 2023. All costs are fully reimbursable from the third-party High Speed 2 (HS2) project. As part of the annual Programmes and Investment Committee submission, authority was increased by £6m in May 2022.

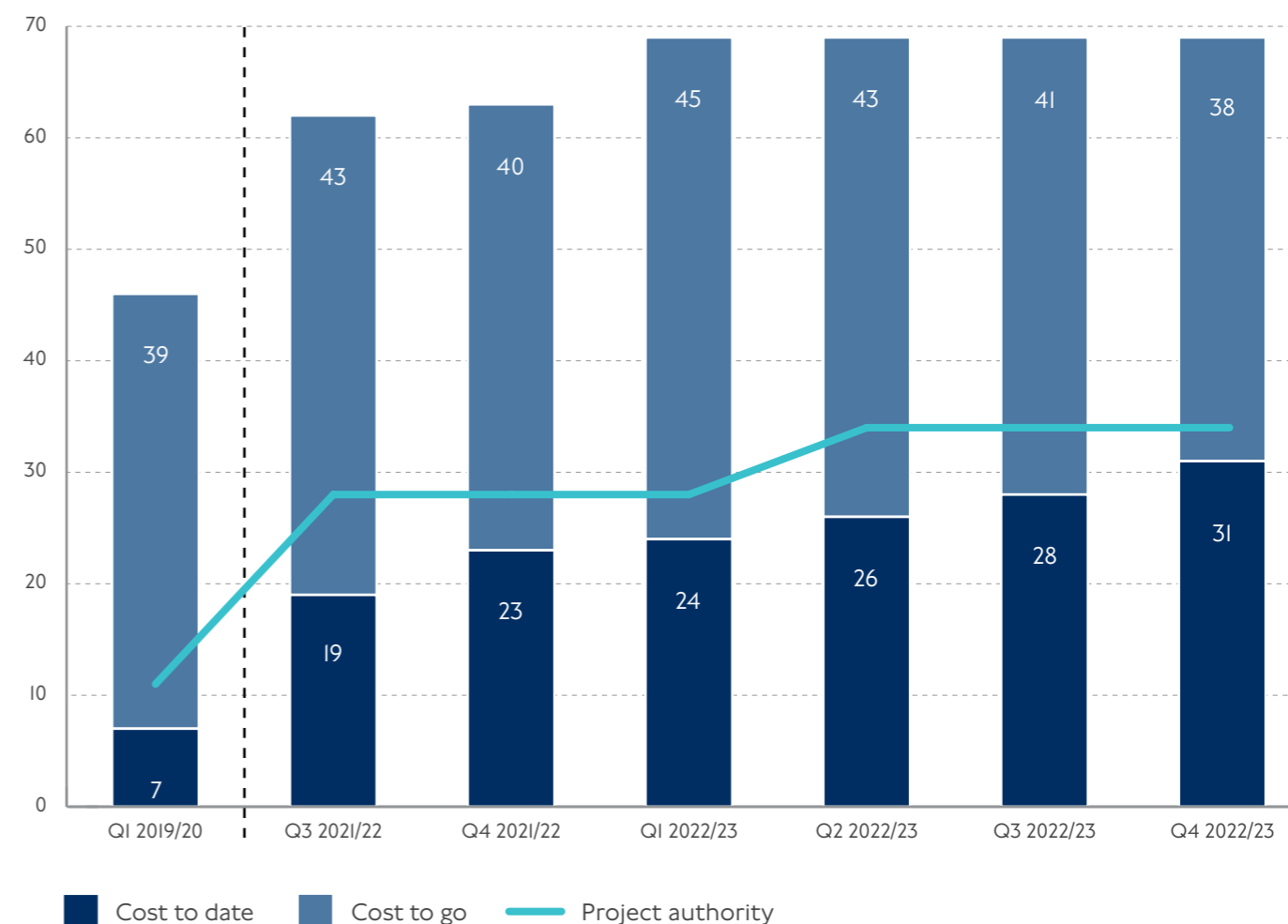
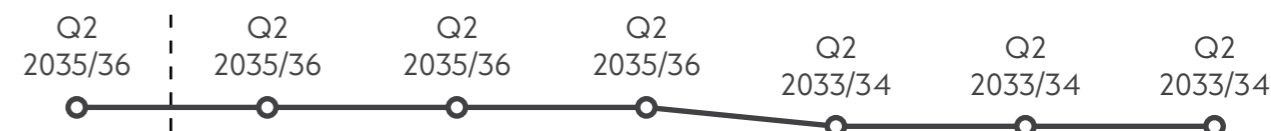
## Performance over time commentary

The forecast end date was amended in Quarter 2 from 2035/36 to 2033/34 to reflect the earliest completion date of works at Euston, as advised by HS2 Ltd. This programme comprises our new assets, infrastructure and operational facilities at Euston and Old Oak Common to interface with the new railway.

Since 2019, the forecast costs have increased due to additional scope being requested by HS2 Ltd, which are fully recoverable. As part of the annual Programmes and Investment Committee submission, the project and programme authority was increased by £6m in May 2022.

## Estimated final cost performance over time (£m)

### Forecast completion date



### Programme update

On 9 March 2023 the Department for Transport announced a rephasing of some elements of the HS2 programme. This means works between Old Oak Common and Birmingham will be prioritised, with some works between Old Oak Common and Euston deferred for at least two years. The deferral will allow for a period of review and pause of the HS2 station and London Underground interchange to focus on affordability. We are working with HS2 Ltd to assess the scope of the remaining works and to adjust the size of the deployed TfL resources accordingly.

The new Northern line traction substation and ventilation building is not impacted by the pause and HS2 Ltd's construction continues at Euston with the below-ground civils structures largely complete and works progressing above ground.

We are awaiting a decision by the Department for Transport on the transport of materials by rail following the feasibility study by HS2 Ltd, which concluded that this was no longer feasible on the grounds of cost. The TfL Commissioner and Chief Executive of the London Borough of Camden have jointly written to the Chief Executive of HS2 Ltd to express our concerns about road safety, air quality and congestion if HS2 Ltd continues with its intention to transport spoil by road.

The intensive utilities enabling works on Euston Road were started by HS2 Ltd at the beginning of 2023 with major lane and footway closures commencing on 20 February. The initial eastern section to remove the central reservation has now been completed but the remaining sections will not now go ahead as this workstream is suspended by the deferral. We are working closely with HS2 Ltd to agree the reinstatement of the eastern section of Euston Road.

Despite the affordability challenges for the HS2 project, we continue to work with The Euston Partnership to ensure our requirements are met for the future bus station, taxi rank, cycle parking and London Underground station at Euston. Engagement with the partnership on the integrated development of the Euston campus of University College London also continues, including the refurbishment of the existing Euston national rail station.

The works at Old Oak Common are not impacted by the Euston design pause and we continue to work with HS2 Ltd on the design development of the new surface intermodal area. In particular, we have reinforced the need for our requirements to be met for buses, cycling and the new Elizabeth line station, which includes the need to secure level access.

Given the likelihood of a prolonged period of Old Oak Common being London's temporary terminus for High Speed 2 services, we continue to make representations about the need for level boarding between Elizabeth line and HS2 services and the serious concerns we have regarding the likely overcrowding of Elizabeth line services.



Ensuring HS2 is integrated with our network at Euston is a priority

# Railway systems enhancements

Forecast completion	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: EFC versus authority (£m)
2018/19 to 2028/29	149	16	165	171	6
<b>Change since last Investment programme report</b>					
No change	1	1	2	No change	

## Financial commentary

Since the last report, the EFC has increased by £2m. This is due to prolongation of programme management resource as Jubilee and Northern line signalling projects are extended or rephased to accommodate other priorities and rework across the TFL and Thales portfolio. Additionally, there have been cost increases for new emerging scope for safety-related works on the Jubilee line.

## Performance over time commentary

Since the last report the EFC has increased by £2m for the reasons already mentioned in the financial commentary.

## Programme update

Delivery of the scheduled Northern line signalling software updates continues, with the first release targeted for commissioning on the railway in Quarter 3 2023/24 and the final in Quarter 2 2024/25. This later release has been rephased to accommodate other priorities in TfL Capital that are dependent on the same supplier key resources. These priorities include the Four Lines Modernisation and DLR rolling stock replacement programmes. The

Northern Line software updates address residual issues and requirements following completion of the Northern Line Extension and the Bank station closure works.

Delivery of the Jubilee line signalling software updates also continues, with the updates addressing residual issues. The first software release was commissioned onto the railway in Quarter 3 2022/23, and the final software release is still being planned, accounting for dependencies on other projects such as the Four Lines Modernisation programme.

The enhancement work for the Northern line power supply was completed in Quarter 4 2022/23, with some minor close-out activities continuing. This has provided system capacity and resilience for reliable services during planned or unplanned outages.

The rolling stock works to enable an increase in entry and exit speeds at Neasden depot are on target for completion in Quarter 3 2023/24. These will support Metropolitan line service uplifts being delivered as part of the Four Lines Modernisation programme.

Estimated final cost performance over time (£m)



# London Underground

We deliver enhancements using internal and third-party investment to provide increased accessibility and station capacity improvements. Our three renewals programmes ensure the safety and reliability of the existing network across infrastructure, train systems and technology



# Train systems

Forecast completion	Cost to date (£m)	Cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: EFC versus authority (£m)
2022/23 to 2027/28	238	1,710	1,948	1,791	(157)
<b>Change since last Investment programme report</b>					
No change	86	(118)	(32)	No change	

## Financial commentary

In common with other portfolios, our current renewals funding is insufficient to deliver all the required work to maintain service performance. Ongoing asset prioritisation will be used to identify the most critical work to progress.

Key movements since the last report include a cost to date increase of £86m reflecting strong performance in the quarter by Fleet Overhauls accounting for £49m, and Track accounting for £29m with the balance delivered by Signals upgrades. Reductions of £118m in cost to go and £32m in EFC are predominantly due to rephasing within fleet overhaul.

## Performance over time commentary

Train systems delivered to budget, taking our full year spend to £238m while achieving £8m of efficiencies and cost savings. The accelerated performance in the quarter was assisted by improved performance reviews across the asset areas to allow us to focus on key issues such as identifying cost savings, resourcing and supplier performance. Delivery confidence in next year's budget is high. There are planned increases in volumes of track and fleet overhauls and we are moving to the main delivery phases on projects such as the Central Line Improvement Programme and incremental signalling renewal projects.

## Programme update

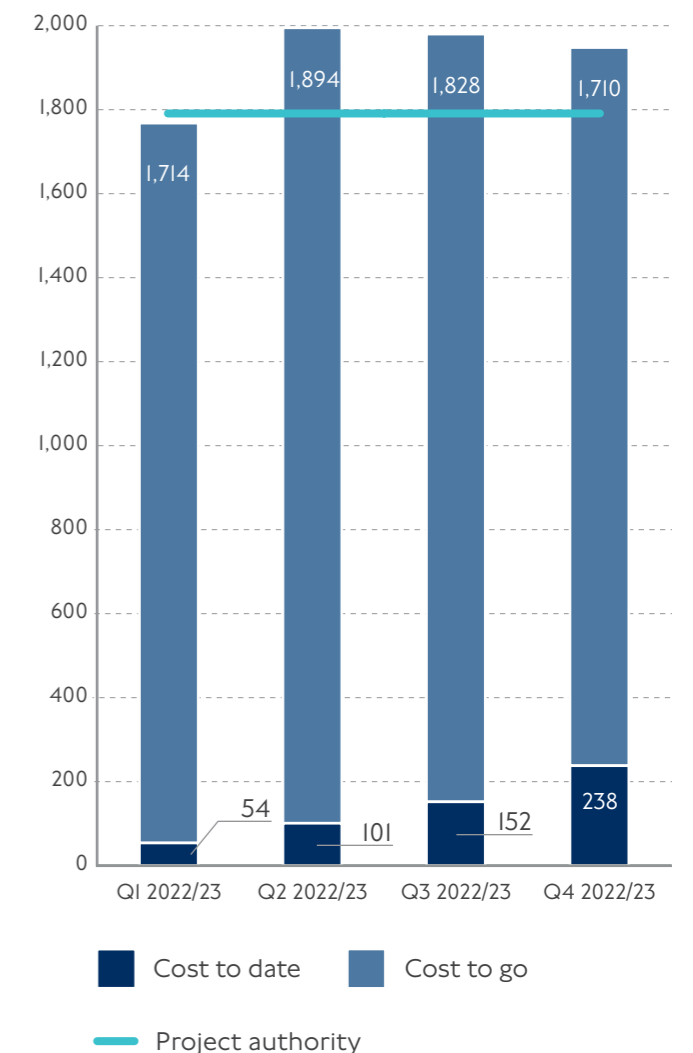
This programme delivers critical renewals across multiple asset groups that form an integrated train system. It includes work on track assets, passenger fleets, engineering fleets and signalling assets.

Our track assets are an essential component of a safe and reliable railway. Track is continually degrading and needs ongoing maintenance and renewals to keep it in good working order. We must renew two to three per cent of our track every year (based on a 20 to 60-year lifespan), as well as to make ongoing component replacements to maintain safety and reliability. Where possible, we also aim to install high integrity, low maintenance modern track forms.

We have more than 600 Tube trains operating across 11 lines, with the oldest trains having entered service in the 1970s. Interventions are based on our long-term fleet cost model, which feeds into our long-term capital plan.

To ensure train fleets remain safe and reliable for an increasing in-service life, we conduct a range of planned interventions consisting of heavy overhauls and renewals (mid-life refurbishments and life-extension projects). In addition, we deliver specific work to improve accessibility and customer satisfaction, such as better lighting and CCTV. These works address changes in regulations arising from safety issues, poor reliability and performance, unacceptable costs or system obsolescence.

## Train systems performance over time (£m)







Overhauling our fleet ensures continued passenger safety and comfort

Our heavy overhauls work delivers large scale activities on our existing fleet of passenger rolling stock and rail adhesion trains to ensure all core systems meet the required standards. The work requires each train to be removed from service for several days or weeks, and includes overhauling suspension, wheelsets, motors, brake systems and auxiliary equipment.

Signalling and control upgrades continue to keep our systems up to date and in serviceable condition. This avoids higher costs at a later stage, while also ensuring safety, continued reliability and that the overall cost is spread across a closely monitored timeline.

The engineering vehicle fleet supports the track renewals programme and comprises battery locomotives, wagons for different activities and plant equipment such as cranes and tampers. We aim to improve the reliability of this non-passenger fleet, responding to component obsolescence problems and supporting our overarching aim of mechanising track-based activities where possible. Our intention is to facilitate enhanced productivity and an improved safety culture.

#### Key successes this quarter

Across all lines there has been sustained strong performance of routine works in track and fleet overhauls, delivering to plan and meeting strategic milestones. In addition, the Central Line Improvement Programme (CLIP) had a major success in March, achieving full design sign-off for the very complex multi-system renewals work. Our drive to reduce the environmental impact of our train systems continues;

the CLIP design sign-off includes LED lighting and a new power system that reduces energy consumption, delivering regenerative energy back to the network. We have also delivered LED lighting on 16 Bakerloo line trains, with further trains due to be completed in 2023/24.

#### Core track renewals

In Quarter 4, 1,285 metres of bullhead rail was converted to flat-bottom rail, taking the total flat-bottom rail conversion to 5,546 metres over the year. Additionally, our capital delivery milestone for deep Tube track renewal was exceeded, delivering 1,827 metres, 24 per cent above our target of 1,471 metres. At Royal Oak, 102 metres of ballasted track renewal was delivered in Period 13 (3 to 31 March 2023), exceeding the capital delivery milestone.

#### Points and crossings

As previously reported, we renewed four sets of points in Parsons Green that were commissioned in July 2022, and installed a new set of points at Tower Hill commissioned in October 2022. In delivering these sites we met our 2022/23 target for points and crossings.

#### Victoria line (fleet overhaul and depot signal renewals)

Work continued upgrading the pressurised ventilation fan system to reduce maintenance costs, with a further 10 trains completed, taking the total to 46 of 47 trains. Delivery of the coupler overhauls continued, with an additional 12 completed, also taking the total to 46 of 47. Door overhauls continued to plan and 31 trains have completed their phase one works.

#### **Metropolitan line (fleet overhaul)**

The revised delivery rate of two trains per period was sustained and the project has delivered eight additional bogie overhauls, taking the total to 32 of 60 trains. Work has continued to prepare for the start of the S8 fleet doors overhaul and couplers overhaul, both due to start in 2023/24.

#### **District line (fleet overhaul)**

Work continued to prepare for the start of bogie overhaul on the District line, which is planned to follow directly after the Metropolitan line overhaul scheduled for completion in August 2024.

#### **Jubilee line (fleet overhaul and component renewal)**

The bogie overhaul has continued just ahead of plan, with overhaul now complete for seven trains. The project has supported mitigations needed to keep the trains in operation until heavy overhaul takes place.

#### **Jubilee and Northern lines (incremental signalling upgrade)**

The design stage of replacement of central computers for the Jubilee and Northern lines is progressing well, with key enabling works completed during Quarter 3 2022. The procurement activities leading to award for the replacement of train operator displays on the same lines is also under way with award forecast for Quarter 2 2023.

#### **Piccadilly line (fleet overhaul and signalling renewals)**

Work continues on the second lift cycle to overhaul 59 units' bogies. We have now completed 64 per cent of the second lift. Wheels and motors have continued to be overhauled in line with maintenance requirements.

Rewiring of the interlocking machine room at Acton Town has progressed through design and works began on February 2023.

#### **Central line (fleet renewals and signalling renewals)**

In early March 2023, CLIP met its strategic design milestone and has begun full production of all nine sub-systems, from AC traction to CCTV. This strategic design milestone means that all the CLIP sub-systems can enter mass production, and since 3 April we have had more than 100 fitters on site working on four trains simultaneously.

Progress continues on the Central line signalling life-extension projects, with a preliminary design review held with Siemens at Chippenham for the automatic train operations and automatic train protection test rigs. Four track circuits were commissioned in December 2022 at the Ruislip test track, with one further commissioned on 1 April 2023.

Installation and testing activities are ongoing at eight further sites, with commissioning activities planned in the next period at two of these sites.

A human factors workshop was undertaken on the signal control system with operational colleagues. A reliability, availability and maintainability analysis is in the final stages of sign-off. Once this is completed, hardware installation can begin within the equipment rooms and control centre.

Progression of wiring diagram updates by our contractor has continued; however, this is progressing slightly slower than we would expect due to quality issues identified with the submissions which require rework. Further risk reduction workshops have been held to mitigate any delays to the programme.

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

Work continues on heavy overhaul activities, and actions are in progress to bring these under formal capital project delivery governance, in line with heavy overhaul of other fleets, to increase delivery efficiency and certainty. We completed LED fitment on 16 trains on 29 March 2023.

The procurement of signalling equipment and design works is ongoing for the Bakerloo line control room fit-out works and the control system upgrade. We continue to install the key signalling and control interface equipment in lineside rooms on the Bakerloo line. Nine sites have been completed, with Lambeth North under way.

#### **Bakerloo, Central and Waterloo & City lines (accessibility)**

Department for Transport visit at Stonebridge Park depot to see first-hand the challenging works undertaken by the team, especially on the new passenger information system. The visit gave us the opportunity to demonstrate the next steps we need to take to meet RVAR compliance. A Department for Transport site visit to Acton works is also planned for Quarter 2 2023/24 to preview progress on the Central line RVAR works. Work will be completed on 15 train units by April 2024, with full completion scheduled for July 2025.

#### **Depot control systems**

The main depot control project at Northumberland Park has been deferred. This has mainly been driven by necessary re-prioritisation of engineering resources to support the introduction of new trains on the Piccadilly line, which also requires control system works. The Northumberland Park depot project will re-start after the Piccadilly line upgrade is delivered using lessons learned, and common technology and designs where possible. Remedial and small renewals will continue at Northumberland Park in the meantime.

#### **Rail adhesion train**

The overhaul of the 62TS rail adhesion train started in January and the first unit is substantially complete. Preparations are being made for the second and final unit to return to Acton. The timely delivery of this work is essential to ensure the impacts of poor rail adhesion during the leaf fall season are mitigated.



Our engineers work on all aspects of train systems

#### Mechanised track renewal vehicle

The series of trials for prototype mechanised renewal vehicles was completed in February 2023 as planned. There are modifications to improve safety and in-vehicle access prior to further prototype trials in August. Completion of this work will continue to build confidence in advance of the vehicles being used to support track works in 2023/24.

#### Rail-mounted crane

The team successfully obtained single crane operation (open section) assurance approval for Kirow cranes and progressed to work on similar approvals (sub-surface tunnel sections) for the Gloucester Road track renewal in July 2023. The two other assurance approvals for tandem lift (open and sub-surface tunnel) sections have moved to late 2023/24.

#### Track recording vehicle

Maintenance works have been carried out on the track recording vehicle (TRV) to meet the conditions set out in the concessions. The vehicle, more than 55 years old, requires significant maintenance and monitoring to remain in operational use. The TRV suffered an outage in January 2023 and missed critical track recording on the Central line. As a result, the project engineering teams prioritised supporting the maintenance teams in recovering and repairing the TRV to return to operation. This has caused a delay to project activities to test and commission the seven-car TRV train that mitigates the Four Lines Modernisation signalling upgrades.

#### Engineering vehicle overhauls

The delivery of the engineering vehicles overhaul programme has been impacted by supply chain issues. We have embarked on a 'make vs buy' exercise to develop an alternative strategy to overhaul the wagons and expedite the return of these assets to operation.

We began the overhaul of the first of two Matisa tampers with the other to follow in the new financial year, including a strategy for in-house overhaul of the three Plasser tampers. Engineering signed off the locomotive bogie frame repair process after successfully completing the trials. This will be integrated into the overhaul programme of traction and other works.

# Infrastructure renewals

Forecast completion	Cost to date (£m)	Cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: EFC versus authority (£m)
2022/23 to 2027/28	82	531	613	1,192	579
Change since last Investment programme report					
No change	35	(37)	(2)	No change	

## Financial commentary

In common with other portfolios, our current renewals funding is insufficient to deliver all the required work to maintain service performance. Ongoing asset prioritisation will be used to identify the most critical work to progress.

Systems and infrastructure achieved their budget with £35m delivered in the last quarter. The variance between programme and project authority and forecast is £579m reflecting historical authority for this programme. We are establishing a new baseline for programme and project authority to reflect changes in spending priorities; this will be presented with the new combined London Underground renewals paper in September.

Forecast cost has reduced £2m since the last report primarily due to reprioritisation of lifts and escalators scope combined with acceleration of staff welfare.

## Performance over time commentary

The Infrastructure Renewals programme five-year forecast remained constant in Quarters 1 and 2. Between Quarter 2 and the end of the year, however, an overall £14m reduction is observed following a re-prioritisation and rephasing of activities across all asset areas into future years to match affordability and delivery confidence.

## Programme update

The infrastructure renewals programme delivers critical interventions to the assets that support the London Underground network. The programme includes work on the built environment, civils and structures, power assets, as well as lifts, escalators and building systems assets. The work bank is prioritised to address asset condition concerns to maintain the safety and reliability of the railway.

We have 30,000 building and civil assets across the network, providing structural support, stability and protection. The asset base includes more than 16,000 bridges and structures, 235km of embankments and cuttings, as well as tunnels, lighting masks and flood protection assets.

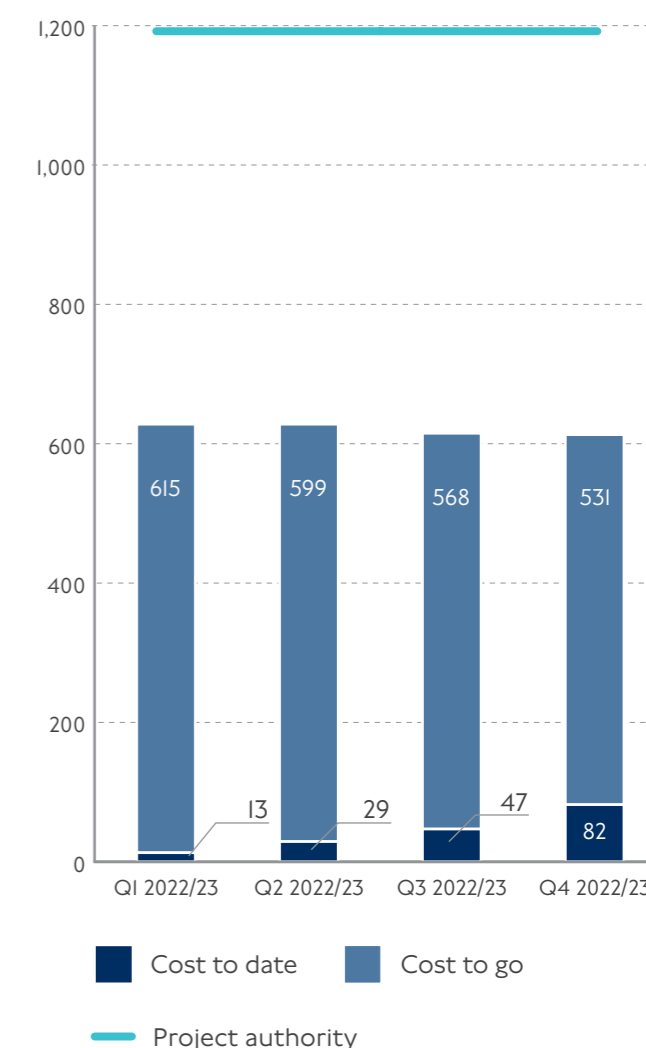
Our complex building systems assets (mechanical, fire, communications, power and electrical) ensure that stations, depots and other sites operate safely and effectively. The work is prioritised on the state of good repair of the assets and to address specific asset condition concerns.

London Underground is the largest consumer of power in London. We operate our own high-voltage distribution network and backup power generation. Based on the state of assets and their expected lifespan, we deliver a rolling programme of renewals to maintain the integrity of power delivery to the railway.

We have 526 escalators, 327 lifts and six passenger conveyors on the London Underground network. These are essential to ensuring customers have safe, reliable and quick access to our services. We deliver a rolling asset renewal programme aiming to deliver renewals and replacement to escalators every 40 years and lifts every 20 to 40 years, depending on the type. This means replacing around 2.5 per cent of escalator and four per cent of our lift assets each year to maintain the current level of good repair

The rolling programme of systems works, including lifts and escalators, continues to plan with two Jubilee line escalator works completed this quarter. We are also on track with our work to deliver energy efficient LED lighting changes at 20 stations in the next financial year. This will reduce operating costs and support our wider carbon reduction aims.

Infrastructure renewals performance over time (£m)



### Key successes this quarter

The Plaistow substation roof replacement project has installed a new roof to replace the old one containing asbestos, delivered five months earlier than planned thanks to strong project management. This was achieved within the agreed project authority and with a £200k saving to budget. We have also seen positive progress on the rolling renewals programmes, with communication systems renewals completed at King's Cross St Pancras and two further Jubilee line escalator refurbishments delivered to plan. In addition, there has been significant progress on survey work to facilitate further delivery in 2023/24.

### Water ingress remediation

Feasibility surveys have been completed at St Paul's and Chancery Lane stations. Work to complete the options for remedial works and seek agreement with stakeholders has been extended due to the identification of further instances of water ingress. The options have been agreed in preparation for final approval with stakeholders in June 2023.

Concept designs at Liverpool Street and Charing Cross were finalised in April 2023 and will be agreed with stakeholders in June 2023. Drainage surveys for Mayor Sworder's Arches substation in London Bridge were completed in February 2023 and the concept design will be completed in June 2023.

### Cutting and embankments

Works are continuing to stabilise the cutting between Grange Hill and Chigwell stations on the Central line to ensure the continued safe running of the railway. Piling works have been completed and the final regrading works paused to incorporate additional work, including anchoring works to the road bridge on Hainault Road and works around the footbridge coming off Hycliffe Gardens. The inclusion of these additional works will save time and money, with the full project now due for completion in December 2023.

### Plaistow substation roof replacement

Works to replace the life-expired asbestos roof were completed five months ahead of plan thanks to strong project management. The project completed a series of complex interventions including installation of a scaffold cocoon and crash deck above live high voltage sub-station equipment and removal and installation of a new roof. All enabling works were also completed without any safety incidents. The principal contractor is now in the process of clearing the site, with final works to deliver scope for staff welfare improvements due to be instructed in early June and the possibility of addressing roof leaks at the station. The contractor is currently negotiating agreements with Network Rail for work above their track. This has been achieved all within the agreed project authority and with a £200k saving to budget.



Work is ongoing to address water ingress issues at St Paul's station

### Station platform remediation works

Feasibility work for platform remedial works has been completed for 94 platforms at 41 stations. 'Quick win' remedial works will start in November 2023 and are scheduled to be completed in Quarter 3 2024/25. Design of remaining selected remediation options will begin in June 2023, and site works are scheduled for Quarter 1 2025/26.

### Welfare facility renewals

Works have continued to improve the condition of welfare facilities and environment for staff across London Underground at 34 locations, including Sloane Square, Edgware depot, Highgate and Goodge Street stations. Staff welfare facilities include mess rooms, kitchens, locker rooms, changing rooms and shower and toilet facilities. Scoping surveys began in March 2023 and options development workshops been held for six locations.

### King's Cross St Pancras communication systems

Works to replace a range of obsolete communications equipment at King's Cross St Pancras station, including station management systems, video, audio and alarm systems are in the final stage of the systems migration. The main systems installation and migration activities were completed in March 2023, ahead of programme, and operational colleagues are now using the new station management system.

### Jubilee line communication systems

Upgrade and installation works continue to plan at Canada Water and Southwark stations, while site works progress to programme at the remaining four stations: London Bridge, Canary Wharf, North Greenwich and West Ham, scheduled for completion in Quarter 4 2023/24.

### Jubilee line ventilation systems

We are progressing with works to upgrade the obsolete tunnel ventilation control panels and refurbish the fans of the staircase pressurisation system at Jubilee line extension stations (Southwark to Canning Town) and intermediate shafts, scheduled for Quarter 2 2026/27. All intrusive surveys for this project are now complete. Replacements of the ventilation management systems are progressing to programme.

### Smoke and heat ventilation

Following design completion, we are now procuring material to replace and refurbish 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. This is scheduled for completion in Quarter 2 2025/26.

### Marylebone escalators

Work is ongoing on the final escalator refurbishment and is due to be finished in September 2023, with the works having been delayed by 12 weeks due to civils buildability issues related to the existing station infrastructure and contractor performance. The completion of the wider station gateline and an additional escalator should provide increased station capacity to support any further increase in customer demand. This is planned to complete in December 2023.

### Jubilee line extension escalators

This rolling programme of escalator refurbishments has delivered two further refurbishments in this quarter at Waterloo and London Bridge stations, taking us to a total of eight in 2022/23, as planned. Works are ongoing on the next three refurbishments at Waterloo, Bank and Stratford stations to complete in Quarter 1 2023/24. We have re-prioritised the programme for the remainder of 2023/24 based on the latest asset performance data and have taken the opportunity to replace obsolete fire detection systems on future escalator refurbishments.

### Liverpool Street escalators

The final premises finishes are in progress for the 12 sets of fire doors ahead of the replacement of three escalators. All 12 sets of fire doors have now been commissioned and are functionally live. Two operational trials have been completed to enable passenger planning, with the new Elizabeth line entrance live. Planned escalator replacement works to escalators seven-nine are forecast to begin in September 2023.

### Holloway Road lifts

Following a design review, we identified a number of issues and are awaiting detailed responses from the supplier. However, this delay did not impact the planned start on site for the main works, which saw the lift removed from service to allow the works to begin in May 2023. Installation of new lighting to lift shafts started in April 2023 and was completed ahead of schedule.

### Secondary lifts

Detailed design is progressing on five lifts, with the instruction to manufacture for the first three lifts issued at the end of April 2023. The start on site for the first lift (Hounslow East lift 1) is planned for September 2023, with the second starting in November.

### Uninterruptable power supply

Works have now completed for tranche one, with all 22 life-expired units replaced and commissioned to ensure a continuous power supply to critical signalling assets on the railway. We awarded a new contract in December 2022, on plan to replace the next tranche of 31 units to enable continuous delivery into 2023/24 and beyond.

### Offline battery power inverters

An offline battery power inverter is a battery system present on all sub-surface stations to power emergency lighting in the event of a power loss. There are around 260 located across the network and they are a critical asset as failure could result in station closures as emergency evacuation is compromised.

We have awarded a delivery contract to replace the first 20 units, and procurement is in progress for a second tranche of 40 to be awarded in Quarter 1 2023/24. Design works have started with our contractor to mitigate the obsolescence risk of the remaining units. Internal scoping and market engagement has begun for further units as part of the strategy work on the longer-term solution.

### Traction power

Site work has continued for the replacement of 11 traction isolation switches at Ruislip depot to address equipment non-compliances and removal of operational restrictions. The final switches were commissioned into service in March 2023, completing the main project works.

Construction work has begun for the replacement of the direct current traction switchboard at Holborn. Detailed site investigations, civil designs and enabling works have been completed, which has allowed our contractor to begin building the new room to house the new equipment in April 2023, with expected completion in April 2024.

### LED lighting

The LED programme works were temporarily paused for the majority of 2022/23 due to funding constraints. The funding agreement with the Department for Transport in August 2022 provided more funding certainty allowing us to take the opportunity to start remobilising earlier than planned in Quarter 3. We have now recruited additional labour and have undertaken advance procurement of materials. Surveys have been completed for Oxford Circus station and Hainault depot, and delivery began in April 2023. We have also reached contract award for scoping surveys of King's Cross St Pancras station in readiness for starting site delivery in Quarter 3 2023/24. Conversion of lighting at smaller stations is being delivered internally, with a new team mobilised to deliver 20 priority stations during 2023/24.



We are upgrading lighting in stations across our network

# Enhancements

Forecast completion	Cost to date (£m)	Cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: EFC versus authority (£m)
2022/23 to 2027/28	544	89	633	585	(48)
<b>Change since last Investment programme report</b>					
No change	(9)	33	24	(70)	

## Financial commentary

With the approval of the Programme and Investment Committee, the portfolio has released the programme and project authority and costs on a number of completed projects. In addition, we have received notification that the capacity increase and step-free access schemes at Colindale and Leyton stations have been provisionally awarded funding from the Government's Levelling Up Fund. These schemes have been added to the EFC for this report and the shortfall in authority will be addressed in future papers.

## Performance over time commentary

The enhancements portfolio has delivered over £3m of cost efficiencies in 2022/23, exceeding our target at the start of the year of £1.4m. We expect to continue to apply learning from previous projects and benchmarking against organisations in similar sectors to drive more savings in future periods.

## Programme update

The enhancements programme covers a range of improvement projects, 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.

The programme had a very productive quarter underpinned by the announcement in January that, following the submission of a compelling and comprehensive bid, the GLA was successful in securing (subject to approval of a full business case by the Department for Transport) £43m from the Government's Levelling Up Fund to deliver station enhancements, including step-free access at Colindale and Leyton stations.

All schemes in delivery continued to make meaningful progress, as well achieving significant milestones on a new third-party funded opportunity at Stratford where site activity has begun.

Work is progressing well to determine the future priorities for step-free access following the publication of the results of our consultation in November; feasibility activity is expected to start in Quarter 2 2023/24. Our draft Business Plan, published on 7 December 2022, illustrates the importance of step-free access, and includes support for such schemes, while recognising that to maximise value it is necessary to target locations that also attract third-party funding.

## Step-free access

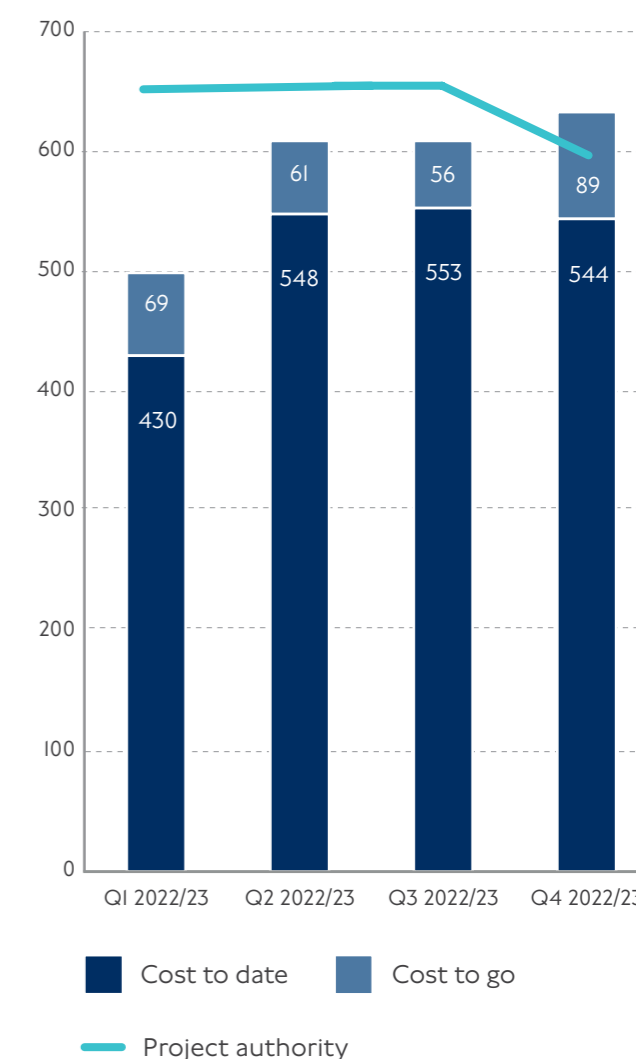
We have secured third-party funding to support the design of an improved step-free scheme at Hounslow West station and delivery of additional step-free access to King's Cross St Pancras station on the south side of Euston Road.

Following the publication of our step-free access consultation, we are continuing the process to develop a prioritised list of stations to undertake feasibility and design for potential step-free options. This accounts for the results of the consultation as well as funding considerations and complexity of schemes. This feasibility work will be delivered during 2023/24.

## Tottenham Hale

The project has completed snagging. Financial close remains on target, due in Quarter 2 2023/24.

Enhancements performance over time (£m)





### Paddington – Bakerloo line

The project continues to progress installation of services and finishes for the new ticket hall and step-free access areas. Challenges integrating the old and new station elements have resulted in some further work being required. Opening to customers is expected in the second half of 2023 with the unveiling of step-free access to the Bakerloo line.

### Colindale

Following the announcement in January that the GLA was successful in securing funding from the Government's Levelling Up Fund, we are undertaking a refresh of the project's business case for approval by the Department for Transport to make this agreement unconditional. We are undertaking updates to the programme and closure requirements, and the associated pre-construction and internal governance processes, ahead of getting project authority to proceed with letting the construction contract. Work is programmed to commence on site in early 2024.

### Hounslow West

In December 2022, the London Borough of Hounslow resolved to grant planning consent for a new 100 per cent affordable housing development on the site of the station car parks. However, the TTL Properties development partner subsequently withdrew from the scheme; this was formalised in March 2023. TTL Properties is seeking a new partner. In the meantime, work is continuing to finalise a funding agreement with the borough to allow the further development of the work to improve step-free access at the station.

### King's Cross St Pancras

A developer-led concept design has been received and is under review by the London Underground team. The developer has undertaken the demolition of the existing Belgrove House to ground slab level. All required ground monitoring is in place. Mace has been appointed principal contractor by the developer and preparation for the construction of the new London Underground station entrance is ongoing.

### Knightsbridge

Due to an unforeseen requirement to re-design a critical civils package, the programme for remaining works is being reviewed. The project team is working collaboratively to mitigate the impact of this delay through early procurement and optimising design assurance reviews to bring critical site works forward.

### Leyton

Following the announcement in January that the GLA was successful in securing funding from the Government's Levelling Up Fund, we are undertaking a refresh of the project's business case for approval by the Department for Transport to make this agreement unconditional. The concept design has been accepted on time and to budget, and subsequently Stage Gate 3 approved. Contract award for detailed design with early contractor involvement to deliver a construction ready scheme will be let in Quarter 2 2023/24 with planned completion by Quarter 4 2023/24.



We are working with the borough to deliver new housing in Hounslow



Our plans to develop London Bridge station will ease congestion

#### London Bridge

We are working with a third-party developer, Great Portland Estates, to open a new Borough High Street entrance. This would result in reduced journey times and congestion at street level, especially on Borough High Street itself. The project is currently awaiting the outcome of a planning inquiry related to the developer's planning application, the announcement for which is expected by August 2023. In the meantime, negotiations are ongoing with the developer regarding the preparation of a development agreement.

#### West Ham

We are working with a third-party developer, Berkeley Homes, to deliver a new ticket hall to serve the Twelve Trees Park housing development, comprising 3,847 units delivered in four phases. The main construction works associated with the new entrance are progressing well, with the construction of the bridge deck completed and the superstructure to begin being erected in June 2023, as the third-party schedule has slipped. Hoardings were erected in April 2023 to allow the removal of the glass block wall that separates the Jubilee line upper concourse with the new ticket hall deck.

#### Waterloo

We are continuing detailed discussions with the developer to progress agreements to ensure step-free access to the Northern line platforms is secured before the re-development of Elizabeth House is completed. This would involve constructing lift shaft structures and connections to the northbound platforms during the progression of the development works. This will enable the future fit-out of the lift shafts after the development, subject to future affordability.

#### Stratford

Detailed design of the new southwestern entrance has been completed and Pathway Gate 4a was successfully passed in February 2023. The construction stage contractor has been appointed and enabling works have begun, with main construction continuing throughout 2023/24.

The scheme is a collaborative venture between the London Legacy Development Corporation, the London Borough of Newham and the GLA, which are fully funding the capital works.

We continue to coordinate with Network Rail, which will be delivering, owning and maintaining a new customer lift that will connect the Jubilee line concourse to the western subway, providing step-free access to the other platforms in the rest of the station. This will allow the removal of the existing platform lift from the stairs leading to the subway, which will reduce congestion in the station and improve reliability. This work is scheduled for completion in late 2023.

### Acton warehouse

Service diversions and roof panel removals have been completed and the building structure demolition began in March 2023. This demolition is due to be completed within Quarter I of 2023/24.

### Substation ventilation

The substation programme has now seen 17 substations fully upgraded and brought into service. The focus for the delivery team is now the tranche 3A works (four sites), where progress has slowed at Shepherd's Bush, Victoria and Notting Hill Gate, due to supplier issues. The delivery team is now considering options to resolve this. The tranche 3B (4 sites) works at Bouverie Place and Barons Court continue to make good progress, with design and planned implementation works at an advanced stage.



We are improving substation ventilation across our network

# Technology

Forecast completion	Cost to date (£m)	Cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: EFC versus authority (£m)
2022/23 to 2027/28	35	174	209	226	17
<b>Change since last Investment programme report</b>					
No change	17	(11)	6	No change	

## Financial commentary

In common with other portfolios, our current renewals funding is insufficient to deliver all the required work to maintain service performance. Ongoing asset prioritisation will be used to identify the most critical work to progress.

Technology delivered £35m this quarter; £17m increase on the last quarter. The variance between programme and project authority and EFC is £17m reflecting historical authority for this programme. A new programme and project authority will be presented later this year. Forecast cost has reduced £6m since the last report primarily due to stations and securities programme works ending.

## Performance over time commentary

The portfolio has met budget in the quarter with an investment of £17m, including accelerated spend for Connect radio handsets and additional installation of critical incident management systems at several stations enabling us to better respond to incidents on our network. The programme has achieved the strategic

milestone of delivery of critical incident management at 100 stations. Improved performance reviews are helping to drive better confidence in our delivery and the portfolio is well positioned to deliver to budget in the coming financial year.

The infrastructure renewals programme five-year forecast remained constant in Quarters 1 and 2 reflecting a pre-prioritisation view of total work bank. Quarters 3 and 4, however, reflect a £103m reduction as post-prioritisation funding constraints are embedded.

## Programme update

Our technology assets include a network-wide radio system and data network, as well as all the software to manage our assets and operate the network. The London Underground technology programme is a rolling annualised programme, consisting predominantly of renewals works, with projects added each year based on prioritisation of business needs. To improve the planning and delivery of our technology investment, we are now working towards combining the London

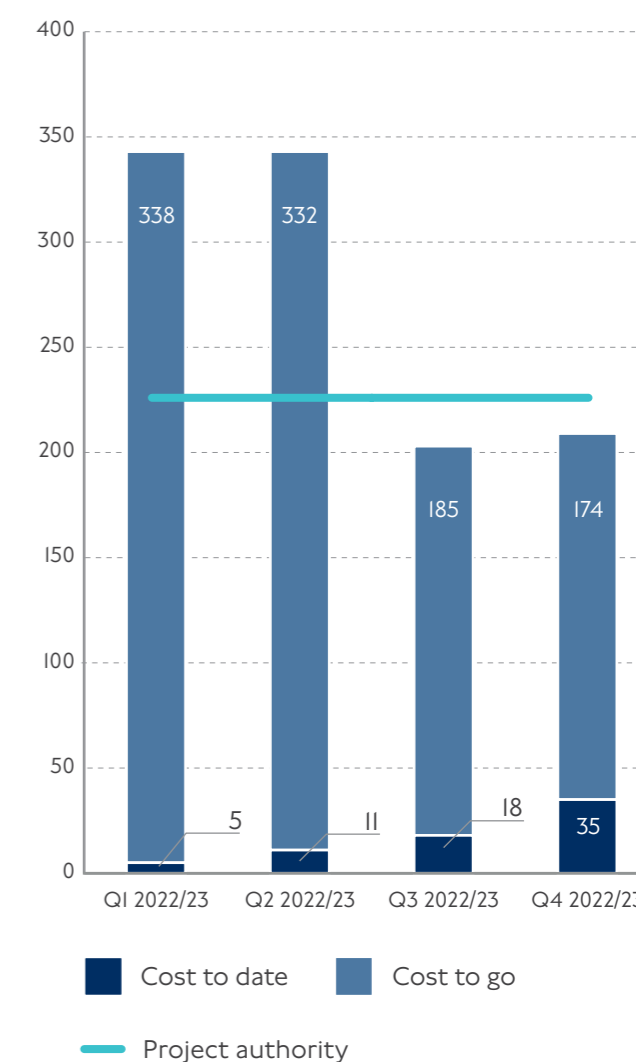
Underground technology programme with other technology-related investment programmes across TfL, meaning we will have one consolidated portfolio for all our organisation's investment in this area.

## Networks and connectivity

We are continuing to work well with our suppliers to upgrade key components of our Connect radio system, focusing now on rolling out new radio hardware base stations. We have replaced key hardware at 276 of the required 293 locations and met our strategic milestone for this financial year in November, enabling the Connect system to continue to function into the 2030s. We are now approaching the final stages of this project and are focussing efforts on the long-term future of our operational networks by renewing our core data networks across London Underground.

We have also delivered critical incident management systems at a total of 101 stations. This range of improvements enables us to effectively manage these stations during a critical incident and other key events. We are continuing to roll out this important safety functionality alongside other improvements to our CCTV estate and plan to complete all works by early 2025.

**Technology performance over time (£m)**



# Surface transport

This comprises Healthy Streets, air quality, asset investment, public transport and surface technology



# Healthy Streets

Reporting period	Cost to date (£m)	Cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: Forecast vs authority (£m)
2020/21 to 2024/25	386	359	744	738	(6)
<b>Change since last Investment programme report</b>					
No change	54	(51)	2	207	

## Financial commentary

The five-year forecast from 2020/21 to 2024/25 has increased by £2m since the last report to align with the latest cost profiles and phasing of Healthy Streets projects. The forecast is above authority by £6m which reflects plans on third-party funded projects. Additional programme and project authority will be requested at the October 2023 Programme and Investment Committee, to cover associated gross expenditure.

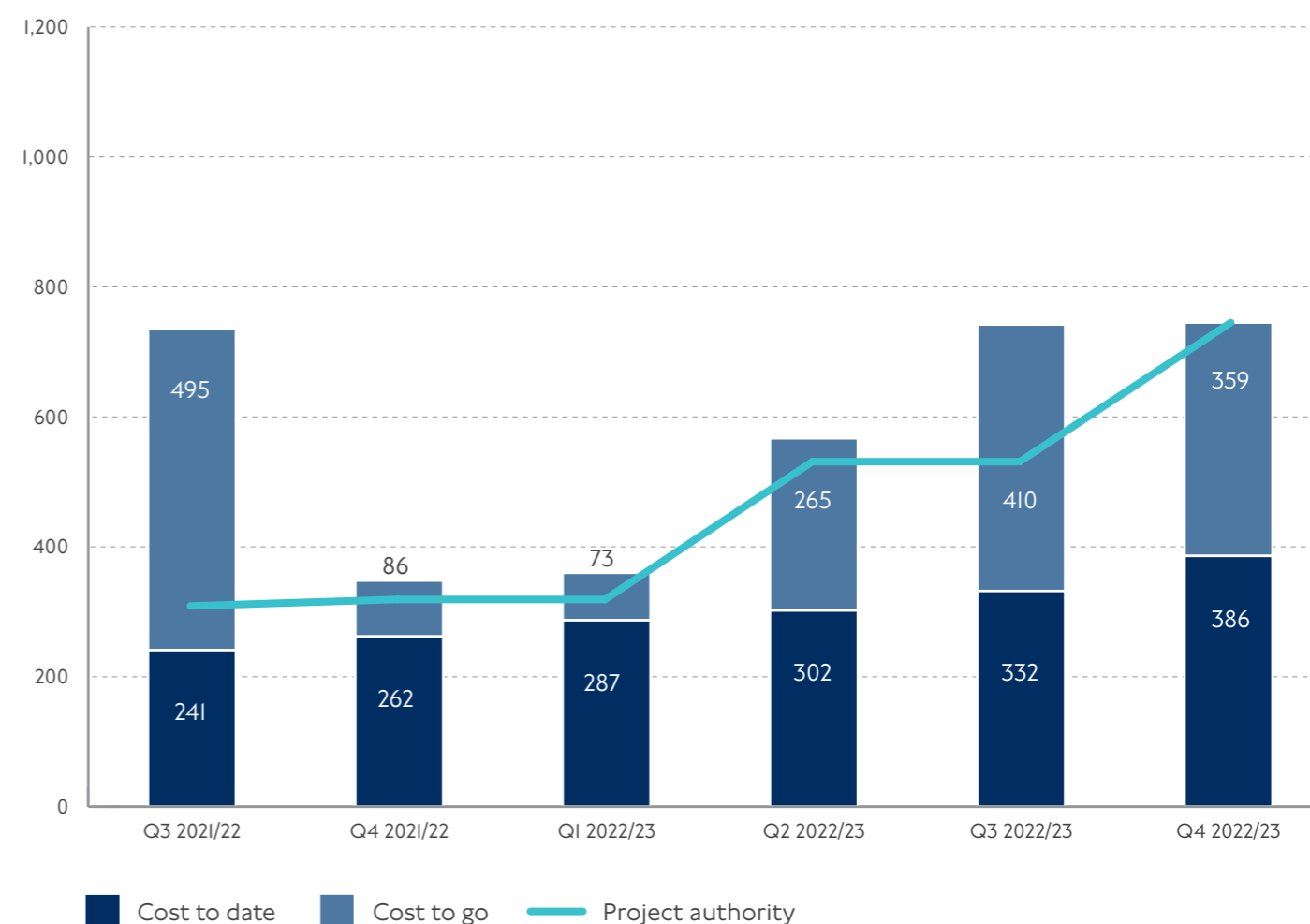
Our capital programme is in line with the funding settlement envelope agreed with Government over the two-year period for 2022/23 and 2023/24. This delivers our committed projects, with additional scope for capital renewals and active travel enabled by the funding agreement. We will continue to provide funding to London boroughs for investment in their streets, although this is accounted for as operating expenditure. The total investment in safe and active travel, across both operating and capital expenditure, is an average of £150m per year across our Business Plan 2022/23 to 2025/26.

## Performance over time commentary

Following the Government funding settlement and TfL board agreement of the 2022/23 to 2025/26 Business Plan, investment in Healthy Streets has increased over the last three quarters. This includes continued investment in and commitment to deliver the walking and cycling, bus priority and safety-related action plans.

The programme and project authority has increased by £207m, following approval at the March 2023 Programmes and Investment Committee meeting. The approval now covers forecasted commitments to March 2025.

Estimated final cost performance over time (£m)



### Programme update

The Healthy Streets programme continues to reduce road danger in line with the Vision Zero action plan, 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.

Recent highlights across the programme include the completion of monitoring to inform TfL decisions on the future of more temporary or experimental schemes installed as part of London's response to the coronavirus pandemic. This has resulted in work starting at Borough High Street to replace the temporary blue barriers with a trial of semi-permanent materials.

In March construction of a new segregated cycleways between Kew Bridge and Waterman's Park and around Lea Bridge Roundabout began. At the end of March, a new 20mph speed limit came into force in the London boroughs of Camden, Islington, Hackney, Tower Hamlets and Haringey on more than 28km of our roads; and the final infrastructure changes for the 24-hour bus lane scheme were completed, including the permanent removal of over 150 parking bays from bus lanes on our roads.

We have now allocated more than £63m in funding for London's boroughs in 2023/24, with more to follow in 2024/25. Local Implementation Plan funding will support London boroughs to deliver new cycle routes, School Streets schemes, new or upgraded pedestrian crossings, bus priority schemes and 20mph speed limits on borough roads. The allocations will allow London boroughs to progress a number of proposals.

These include:

- Junction and corridor improvement schemes to make London's streets safer, better for active travel and more reliable for buses
- Five Liveable Neighbourhood schemes in Holborn (Camden), West Ealing (Ealing), Enfield Town (Enfield), Greenwich town centre (Royal Borough of Greenwich) and Coppermill Village (Waltham Forest)
- More than 150 proposals for new or upgraded pedestrian crossings
- Cycle training for more than 20,000 adults and 40,000 children
- More than 3,500 secure residential cycle parking spaces

Specifically in outer London, this funding will help deliver a range of improvements to help support more active travel and the expansion of the Ultra Low Emission Zone across London on 29 August 2023. These include working with London boroughs to introduce more 20mph speed limits on their road networks, as well as continuing a rollout of School Streets across Barking, Brent, Ealing, Hounslow, Redbridge, Richmond, and Waltham Forest, and more than 50 feasibility schemes for new cycle routes.

### Old Street Roundabout

Construction has continued on the highway works on the four approach arms to the junction, including the infilling of subway 3 on the southwestern side of the junction. Carriageway resurfacing was completed in April and commissioning of the new traffic signals was successfully undertaken in May.



Healthy Streets projects are a major part of our work

Building work to the superstructure for the new main station entrance continues, with the green roof and glazing works substantially complete and internal fit-out under way. Works are progressing elsewhere in the peninsula area with installation of new sustainable drainage systems and hostile vehicle mitigation bollards.

Works to the existing roof structure have continued, with installation of the external steelwork for the clerestory building completed and cladding works now under way. Construction of the new passenger and goods lifts have been completed ahead of standalone testing in the September.

Refurbishment of the subsurface concourse area continues, with installation of new mechanical, electrical and communications equipment. Installation of new shop fronts for the retail units and fire doors is now planned for October. The power supply to the new switch-room to enable testing, commissioning and handover of the new assets was successfully completed in early April.

As well as the green roof for the main station entrance, the project is promoting other environmental initiatives with sustainable drainage systems installed in the disused subways for which there is a £155k funding contribution from Thames Water. Last year the site became diesel-free so all plant and machinery is now battery and electricity powered.

#### **Cycleway 4 London Bridge to Greenwich**

The London Borough of Southwark is continuing to construct the temporary scheme for Lower Road between Rotherhithe Roundabout and Surrey Quays Road, which will complete the final section

of a protected cycling route between London Bridge and New Charlton.

#### **Cycleway 9 East Kensington Olympia to Brentford**

Works to improve cycle safety on Chiswick High Road between Chiswick Lane and Heathfield Terrace were completed on 16 February and the cycleway reopened for use.

Works to deliver a new segregated cycleway between Kew Bridge and Waterman's Park started on 27 March.

#### **Cycleway 23 Lea Bridge to Dalston**

Construction of segregated cycleways around Lea Bridge Roundabout began on 13 March. The design for Lea Bridge Road is under way and is being undertaken by the London Borough of Hackney.

#### **Cycleway 37 Mile End to Westferry Lane**

Work to deliver the permanent scheme at Mile End Road junction was due to begin in February but the London Borough of Tower Hamlets does not agree with elements of the proposals and consequently has not signed a section 8 agreement permitting the works. Discussions are under way again with the borough but until this is resolved, construction is delayed. The deliverability of the remaining sections including the temporary-to-permanent scheme on Burdett Road is being reviewed.

#### **Cycleway 50 Finsbury Park to Tottenham Hale**

Construction of the section on our roads from Caledonian Road to Finsbury Park started on 20 February. Works are under way on two sections of this route at Isledon Road and Parkhurst Road.

#### **Developing the future active travel programme**

The Department for Transport's active travel fund has now delivered more than 25km of new or improved cycling infrastructure. London boroughs worked tirelessly to deliver ambitious schemes within short timescales, significantly expanding London's cycle network. Building on the success of the programme, expansion of the cycle network will continue across London via the borough cycling programme with £15m of improvements to be delivered in 2023/24.

Temporary schemes that were delivered during the coronavirus pandemic under experimental traffic orders continue to be reviewed and made permanent where appropriate. This includes works in January 2023 to convert the Borough High Street scheme from temporary blue barriers to semi-permanent footway build-outs, to provide additional space for pedestrians.

#### **Lowering speed limits**

Lowering the speed of vehicles in London is key to reducing both the likelihood of a collision occurring and the severity of the outcome. The second phase of the programme is under way, and as detailed in the Vision Zero progress report published in 2021, aims to provide a 20mph speed limit on 220km of our roads by May 2024.

Raised pedestrian crossings will soon be introduced at eight locations in the boroughs of Westminster and Enfield to further reduce danger to people walking and increase compliance with the newly reduced speed limit, as well as introducing accessibility benefits for customers with reduced mobility.

A new 20mph speed limit came into force on over 28km of our roads on 31 March 2023, in the boroughs of Camden, Islington, Hackney, Tower Hamlets and Haringey. Over 142km of our roads are now subject to a 20mph speed limit.

In March 2023, we began local engagement on proposals to lower the speed limit to 20mph on sections of our roads in the boroughs of Kensington and Chelsea, Greenwich, Lewisham, Southwark, Lambeth, Wandsworth and Merton. Detailed design is now under way.

Concept design is under way to lower the speed limit to 20mph on selected roads in the boroughs of Wandsworth, Richmond, Sutton and Merton, and on the A312 Harlington Road in West Hounslow. A new 30mph speed limit is proposed on the A4 Great West Road in Hounslow. A new 40mph speed limit will also be introduced on A4 Bath Road in Hillingdon and on the A406 North Circular Road in Enfield and Waltham Forest. These projects are scheduled for delivery by March 2024 and account for almost 78km of our roads.

In February 2023, we published indicative results from monitoring of Phase I of the Lowering Speed Limits programme. Since a 20mph speed limit was introduced on the remaining TfL roads within the Congestion Charging Zone in March 2020, collisions have reduced by 25 per cent and collisions involving those walking, cycling or motorcycling have reduced by over a third. We plan to undertake further monitoring of personal injury collisions and vehicle speeds once post-implementation collision data is available for the full three-year monitoring period.





We have improved safety at 44 junctions across London

### Safer Junctions

In April 2017, the Safer Junctions programme highlighted 73 of the most dangerous junctions on our roads, defined as those with the highest rate of collisions involving vulnerable road users. We have made improvements at 44 of these junctions.

Construction at the York Road Roundabout in Wandsworth was completed in May 2023, delivering safety improvements for motorcycle users. Construction on the junction of Holloway Road and Drayton Park began in late April 2023, delivering safety improvements for pedestrians with new and improved crossings, due for completion in May 2024.

Consultation on the second phase of improvements at the Battersea Bridge junction with Cheyne Walk closed in late January 2023. This scheme proposes new crossings on the remaining arms of the junction, as well as safety improvements for cyclists. We intend to publish the consultation report in late June.

We are committed to public engagement on potential changes to ten further junctions identified by the programme by the end of 2024.

### Bus priority programme

Following the completion of an internal assessment process to identify potential new bus lane locations, our findings were shared with borough officers who have proposed schemes with the potential to deliver up to 30km of new bus lanes on their roads by March 2025.

Funding to develop these schemes has since been granted, and we are working with the relevant boroughs to develop these schemes in 2023/24.

These schemes will be progressed alongside new bus lane proposals on our roads, where we hope to introduce 4km of new bus lanes by March 2024. This is to meet the Government target of delivering 25km of new bus lanes by March 2025. Currently, 3.97km have been delivered across borough roads and our roads, and we are on target to deliver a total of 10km by March 2024.

In addition, we recently announced over £10m of funding for London boroughs to deliver enhanced bus priority on their local borough road networks. This funding will both support the bus lanes described above and, deliver other bus priority features such as new bus gates, the removal of pinch-points and changes to the operating hours of bus lanes.

In 2022/23 we reviewed signal timings at 495 sites and made signal-enabling upgrades at 57 sites to deliver improvements to bus journey times.

The final infrastructure changes for the 24-hour bus lane scheme have now been implemented. This includes the permanent removal of over 150 parking bays from bus lanes on our roads. These bays were originally suspended as part of the 24-hour bus lane experimental order in 2020 and have now been removed permanently from our roads, helping to improve bus progression and reliability.

# Air quality

Reporting period	Cost to date (£m)	Cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: Forecast vs authority (£m)
2020/21 to 2024/25	311	443	754	713	(41)
<b>Change since last Investment programme report</b>					
No change	43	(2)	40	254	

## Financial commentary

The five-year forecast cost from 2020/21 to 2024/25 has increased by £40m since the last report. This is primarily due to the inclusion of the full forecast for investigation into a potential future Road User Charging scheme, which the Mayor asked us to begin exploring in March 2022; whereas the last report only included forecasts up to 2023/24. There has also been re-phasing within the portfolio after the go live date was changed from October 2025 to September 2026 to allow for re-let of contracts and delivery of the business operations system in-house.

The variance of £254m programme and project authority since the last report was approved at several Programmes and Investment Committee meetings: £170m on 14 December 2022 (Period I0); £77m on 1 March 2023 (Period I3); and £7.5m for DVS2 as part of Active Travel on 4 October 2022. The paper in October was approved under Healthy Streets and was transferred to Air Quality after the last report was published.

The £41m variance to forecast versus authority is due to programme and project authority only being sought for 2022/23

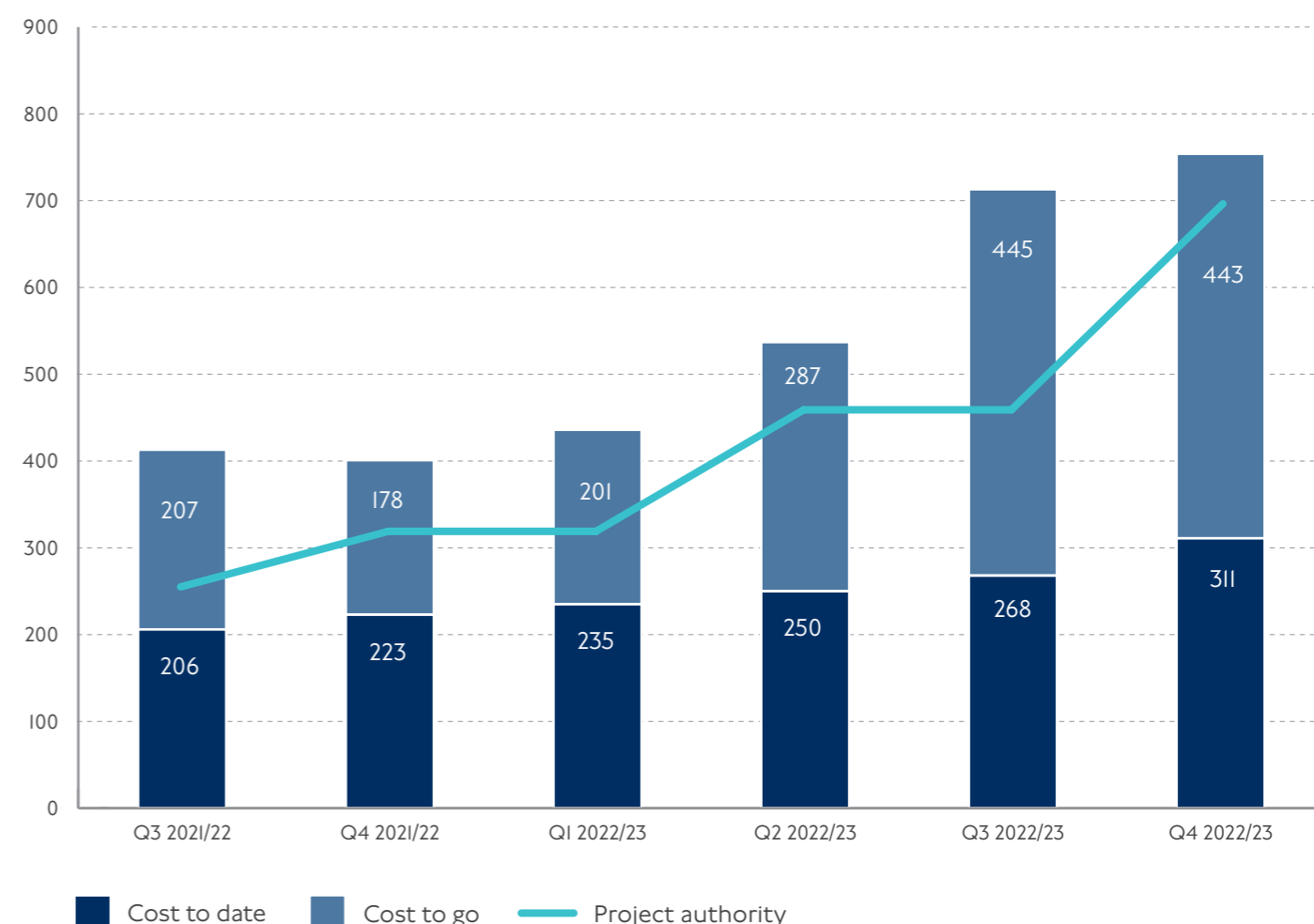
and future known commitments for Road User Charging schemes in 2024/25 whereas the forecast cost is to the end of 2024/25 for all known expenditure.

## Performance over time commentary

Over the last six financial quarters, our forecast cost has fluctuated, driven by funding challenges brought about by the pandemic, which meant several projects had to be put on hold. However, since Quarter I 2022/23 and the funding agreement confirmed in August 2022, the position has improved. The costs associated with the London-wide ULEZ expansion in 2023, as well as the costs of the associated scrappage scheme, are now part of the portfolio forecast.

Since Period 6, the full forecast of a potential future Road User Charging scheme has been included and full allocation of renewals and road user charging schemes such as re-let of contracts and delivery of business operations systems in-house. A paper was approved by the Programmes and Investment Committee in December 2023 for £170m and March 2023 for £77m to increase the project and programme authority to address the above matters.

Estimated final cost performance over time (£m)



### Programme update

#### Electric vehicle infrastructure delivery

It is expected that London will need between 40,000 and 60,000 electric vehicle charging points by 2030, including up to 4,000 rapid chargers. 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 roll out 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 (EVID) programme will deliver rapid and ultra-rapid charging points across 100 parking bays on our roads. Following the release of the first sites to the market in November 2022, we have now completed the evaluation of bids from prospective suppliers. We signed our first contract with charge point operator (CPO) Zest in early May, to deliver an initial batch of 39 charging bays across 24 sites. This infrastructure will be delivered using a full 'turnkey' solution from the CPO.

We have now completed a preliminary assessment of 2,000 sites across the GLA estate and are planning to accelerate the release of more to the market, to tender all remaining tranche 1 sites by the end of June 2023. In addition, we have reviewed current assessment criteria, to bring forward new sites across TfL and wider GLA land, with active engagement with the London Fire Brigade, London Ambulance Service and the boroughs to identify opportunities. This wider pool of sites could help deliver the volume of charging infrastructure London requires, as set out in the electric vehicle infrastructure strategy by 2030.

In addition to the roll-out of rapid EV charging points through EVID, the Office of Zero Emission Vehicles (OZEV) has recently announced that London will receive £35.7m capital funding through the Department for Transport's Local Electric Vehicle Infrastructure (LEVI) fund. This will primarily be used to accelerate the delivery of low-powered charging infrastructure on borough highways, including for 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 LEVI pilot funding and additional borough delivery funded by the government's On-street Residential Charge Point scheme.

#### Zero-emission bus fleet

Key to our journey to reaching net-zero carbon emissions across our operations is the work to transition our entire bus fleet of approximately 9,000 vehicles to zero carbon emissions by 2034. We now have more than 950 zero-emission buses in the fleet, with around a further 700 zero-emission buses on order with various manufacturers. We remain open to trialling new types of zero-emission technology, which includes hydrogen fuel cell and battery electric buses, which make up the largest proportion of the zero-emission bus fleet, and more recently 'opportunity charged' buses, which operate on route 132 in Bexleyheath. We currently have the largest electric bus fleet in western Europe.



We are installing new vehicle charging points at 100 sites on our roads

With financial support from Government, we could transition to a fully zero-emission bus fleet by 2030, but the window of opportunity to make this a reality is closing, given our bus contracts generally run for seven years. If we progress on this now, we can demonstrate the UK's leadership on tackling the climate and ecological emergency and make a significant difference to those living in, working in and visiting the capital.

Work continues on building electric bus charging infrastructure (using pantographs to deliver a quick, high-power charge) at either end of route 358 in Bromley. This will also see the introduction of 20 new single-deck buses combining innovative electric bus technology and enhanced customer features on board. The trial is expected to launch in early November this year. These new technologies are supporting the wider objective of converting the fleet to zero emissions no later than 2034; helping to tackle the climate emergency while supporting manufacturing, jobs and innovation.

### Road User Charging

To help address London's polluted air and improve the health of people across the capital, the ULEZ is expanding London-wide to cover all London boroughs from 29 August 2023\*. Modelling suggests this expansion will reduce the number of non-compliant cars each day from 160,000 to 46,000, and the number of non-compliant vans from 42,000 to 26,000. Overall, the scheme is forecast to lead to 146,000 fewer car trips (a reduction of nearly two per cent) and reduce London-wide road transport emissions

of nitric oxide and nitrogen dioxide by an estimated 5.4 per cent. This is equivalent to a 6.9 per cent reduction in outer London.

To assist with ULEZ expansion, on 30 January 2023, a new £110m vehicle scrappage and support scheme was launched, the largest of its kind. When launched, it provided support for Londoners on lower incomes, disabled Londoners, charities sole traders and businesses with ten or fewer employees to replace or retrofit their old polluting vehicles and make sustainable travel choices. At the beginning of June, the Mayor announced the expansion of the scheme to tens of thousands more Londoners, including those receiving child benefit and all small businesses registered in the capital with fewer than 50 employees, which will now be eligible for financial support to replace polluting vehicles from the end of July. Previously only businesses with up to ten staff could apply. The scrappage scheme will be kept under review and the Mayor has asked us to monitor applications from care workers to ensure they are able to benefit from the money available.

There are also new grace periods under the ULEZ scheme for sole traders, microbusinesses, small businesses and registered charities with non-compliant vehicles that have ordered new compliant ones but have been informed that delivery will be delayed until after the expanded zone has gone live, or which have booked an approved retrofit appointment for a non-compliant light van or minibus before that date.

Successful scrappage applicants receive a grant to scrap or retrofit their vans and minibuses. Successful car and motorcycle scrappage applicants can opt to receive a smaller grant accompanied by up to two free annual bus and tram passes, which would give them a higher value package. In addition, to further help disabled Londoners, there will also be two new grace periods under the ULEZ scheme that will allow the use of non-compliant vehicles, which will apply until October 2027. One is for recipients of certain disability benefits (or their nominated driver) and the other is for all wheelchair accessible vehicles and some vehicles with other adaptations. People must register for these grace periods and applications opened on 30 January.

The London-wide information campaign, launched in January 2023, is continuing to raise awareness of the ULEZ expansion on 29 August 2023, encouraging Londoners to check their vehicle and emphasising the health benefits of the scheme. We are also working with stakeholders including London and home counties boroughs, MPs and London Assembly Members, businesses, community groups and organisations representing disabled people, as well as a wide range of other Londoners to raise awareness of ULEZ expansion and the scrappage scheme. Letters to non-compliant vehicle drivers and door drop leafleting started in early May following local elections.

Installation of infrastructure to support the London-Wide ULEZ launch on 29 August 2023 is underway. Since 5 December 2022, 17 of 24 boroughs have signed agreements to give TfL consent to install enforcement

cameras (when not on TfL-operated traffic signals) and new Department for Transport authorised combined LEZ-ULEZ signage on their road networks. We have sought to install cameras and signs in the other seven boroughs using direct installation powers, subject to being granted the street works permits where required.

Installation has initially focused on TfL assets (such as traffic signals) and the TfL Road Network, where we are the highway authority. Up to 11 June 2023, we had installed 1,340 cameras, 994 on borough roads and 346 on our road network. We have also installed 1,252 signs, of which 769 are boundary signs inside the current zone. Installation of 152 advanced directional signs that give warning of impending entry into the Ultra Low Emission Zone began on 18 May and 633 new in-zone repeater signs which provide notification of camera enforcement are progressing.

Unfortunately, there have been reports of vandalism to a number of ULEZ cameras. All incidents are reported to the police and some arrests have been made. We are working closely with suppliers and the police to reduce the risk of further incidents.

We are preparing the London-wide ULEZ back-office system to ensure it can process the anticipated increase in data volumes from the additional vehicles in the expanded zone and the higher volume of associated transactions and enquiries expected. We have also started recruiting the additional contact centre agents needed, with recruitment due to complete at the end of June.

\* The confirmation by the Mayor that the ULEZ will expand from 29 August 2023 and his approval of £110m funding for the vehicle scrappage and support scheme is the subject of a legal challenge in the High Court by four London borough councils (Bexley, Bromley, Harrow and Hillingdon) and Surrey County Council. The case will be heard on 4 and 5 July.

## Direct Vision Standard Phase 2

Since March 2021 all Heavy Goods Vehicles (HGVs) over 12 tonnes have been required to obtain a safety permit to operate in London as part of the London HGV Safety Permit scheme. This scheme is safety-focused and contributes to the Mayor's Vision Zero strategy by improving HGV drivers' visibility, thereby reducing the risks HGVs present to vulnerable road users, and is run in partnership with the boroughs through the London Councils. Vehicles that did not meet the minimum one-star on the Direct Vision Standard (DVS) rating are required to fit additional 'safe system' safety measures to the vehicle, originally developed in 2017/18.

From 29 October 2024, the minimum rating to operate without fitting additional safety measures raises to three stars, marking the beginning of phase two of the scheme. A Consultation ran between 14 February and 3 April 2023 seeking views on the proposed Progressive Safe System (PSS). The PSS enhances the current safe system to reflect technological development since it was originally designed (London Councils approved the PSS and other Scheme changes in June 2023). The Scheme has been enforced since March 2021 by means of a penalty charge notice.

These PSS and other changes will build on the safety improvements from the current scheme, including the following outcomes and benefits published in the 'One Year On' report (June 2022):

- The number of fatal collisions involving an HGV where visibility was cited as a contributory factor has halved (from 12 in 2018, the year before the scheme was introduced to six in 2021). The number of serious injuries fell from 48 in 2017 to 17 in 2021
- The average daily compliance rates are very high, with more than 94 per cent of HGVs in London now operating with a Safety Permit and hauliers reporting that they are building DVS requirements into future purchasing decisions



Our Direct Vision Standard improves safety for vulnerable road users

# Asset investment

Reporting period	Cost to date (£m)	Cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: Forecast vs authority (£m)
2020/21 to 2024/25	334	234	568	494	(74)
<b>Change since last Investment programme report</b>					
No change	41	(41)	(1)	No change	

## Financial commentary

The five-year cost forecast from 2020/21 to 2024/25 has remained stable since the last report. The current level of programme and project authority granted in May 2022 covers some but not all of the expected spend for 2024/25. A further increase of £109m for the period through to 2025/26 was approved at the Programme and Investment Committee meeting on 17 May 2023 taking programme and project authority up to £603m (to 2025/26) and £545m (to 2024/25). As the increase was approved in Quarter I of 2023/24. The new authority figure will be updated in the next report. The portfolio is actively seeking further funding from external sources, such as the Department for Transport's Major Road Network programme, to enable an acceleration of key renewal schemes like the Gallows Corner flyover and Brent Cross structures.

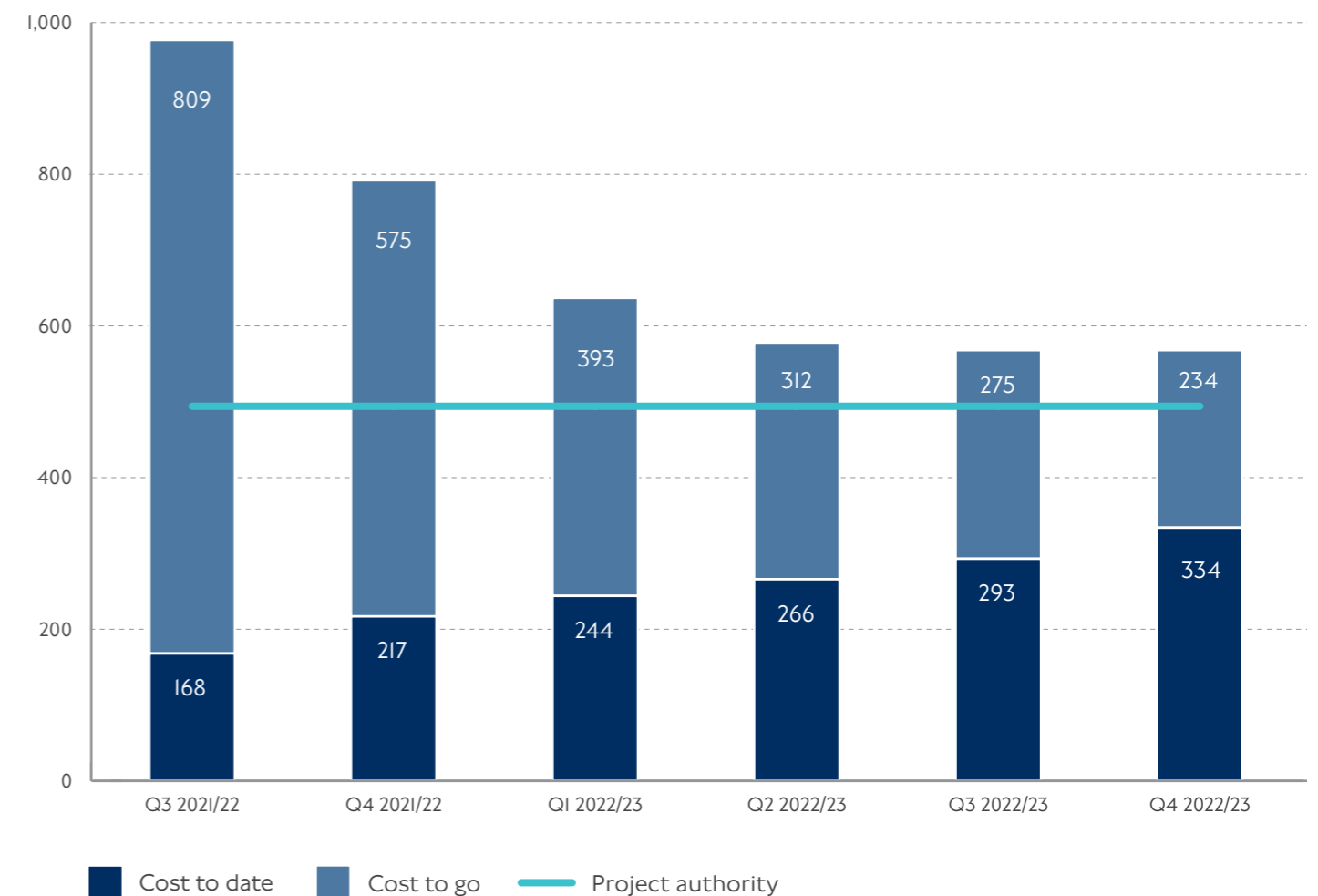
The asset investment portfolio has delivered £5.5m of cost reductions in 2022/23, as project teams found more efficient ways of working and gained increased value for money from suppliers. This represents an improvement on the savings found at this same stage of the previous financial year.

Also, the asset investment portfolio has delivered £5.5m of cost reductions so far this financial year, as project teams found more efficient ways of working and gained increased value for money from suppliers. This represents an improvement on the savings found at this same stage of the previous financial year.

## Performance over time commentary

Over the last six financial quarters, our forecast cost has seen a general decreasing trend, driven by funding challenges following the coronavirus pandemic. This has resulted in several projects being deferred. An increase in programme and project authority to cover spend up to the end of 2025/26 was approved at the Programmes and Investment Committee meeting on 17 May 2023.

Estimated final cost performance over time (£m)



### Programme update

Work is under way to ensure the safety and operability of our highest-priority assets requiring urgent renewals, including critical tunnels and structures.

### Blackwall Tunnel southbound

The 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 JV as design and build contractor in April and we are on target to proceed to design and build stage. Subject to budgets and value for money, we plan to start the works from May 2024.

### 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 design and feasibility work, we have selected a preferred option to fully refurbish and strengthen the flyover. We have briefed external stakeholders who are supportive of the selected option. The option selected has 30 per cent of the scheme carbon compared to the alternative of a full replacement.

The concept design using the existing foundations to support the new deck structure is nearing completion. A final version of the outline business case has been produced and was submitted to the Department for Transport in May 2023 for approval.

### A40 Westway

Following successful completion of Work Package 1 (WPI) which consisted of the major joint replacement, the project is now focused on delivering the remaining scope and work packages. This includes further joint replacements, parapet renewals and repairs to concrete deterioration. The remaining scope has been prioritised and divided into further sub-packages based on asset risk to ensure it is affordable within current budget constraints.

Concept design work for the remaining elements has been completed and accepted by TfL. We are now in the process of awarding the first tranche of Work Package 2 (seven expansion joints) to the same contractors as WPI above. We have accepted the price and programme and notice to proceed will go out in late June 2023. We will also be progressing with the design of WP2B (three expansion joints) to establish the earliest opportunity to replace these remaining vital components. We will continue to progress WP2C (concrete repairs and other works) later subject to budget availability.



We are renewing critical systems in the Blackwall Tunnel



We are preparing a major safety overhaul of Rotherhithe Tunnel

#### Rotherhithe Tunnel

We have completed the design work and preparation of tender documents for the detailed design and build procurement stages of the refurbishment project. However, due to the need to retain sufficient cross-river travel opportunities while the works take place at the Blackwall Tunnel, the next nearest road crossing in the east, we now expect that the full refurbishment of Rotherhithe Tunnel will not take place until after the Silvertown Tunnel opens in 2025.

We are putting in place a series of short-term capital interventions to ensure the tunnel remains safe and operable until the main refurbishment project is progressed. We have completed procurement activity for some of the short-term capital interventions, including the fire main and tunnel lighting, and have awarded a contract to progress feasibility work. Investigations works are progressing. Options for delivery will be developed by September 2023 to inform decisions on the best value for money.

#### Hammersmith Bridge

We released our third of the share of the costs for the stabilisation works, which meant the London Borough of Hammersmith & Fulham started works earlier in 2022. We expect these works to be completed by the end of June 2023. Alongside the Department for Transport, we continue to support the borough in developing a business case for the longer-term strengthening works.

#### Carriageway renewal

Following the early delivery of 130,000 square metres of carriageway resurfacing in December 2022, we provided additional funds to stretch the delivery output. Over 30 carriageway schemes were delivered with an output of 218,000 square metres. Although road space approvals were in place, the adverse weather in Quarter 4 2022/23 resulted in four schemes being deferred to 2023/24. In addition to the build schemes, 40 preliminary designs and 28 detailed designs were completed in 2022/23, enabling delivery in the new financial year to start at pace and ensure that a successful first quarter.



# Public transport

Reporting period	Cost to date (£m)	Cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: Forecast vs authority (£m)
2020/21 to 2024/25	203	252	454	283	(171)
<b>Change since last Investment programme report</b>					
No change	33	(43)	(12)	No change	

## Financial commentary

The £171m variance to forecast versus authority is due to programme and project authority only being sought up to 2023/24 and for future known commitments, whereas the forecast cost is to the end of 2024/25 for all known expenditure. There is no change to the programme and project authority approved in the July 2022 Programmes and Investment Committee submission.

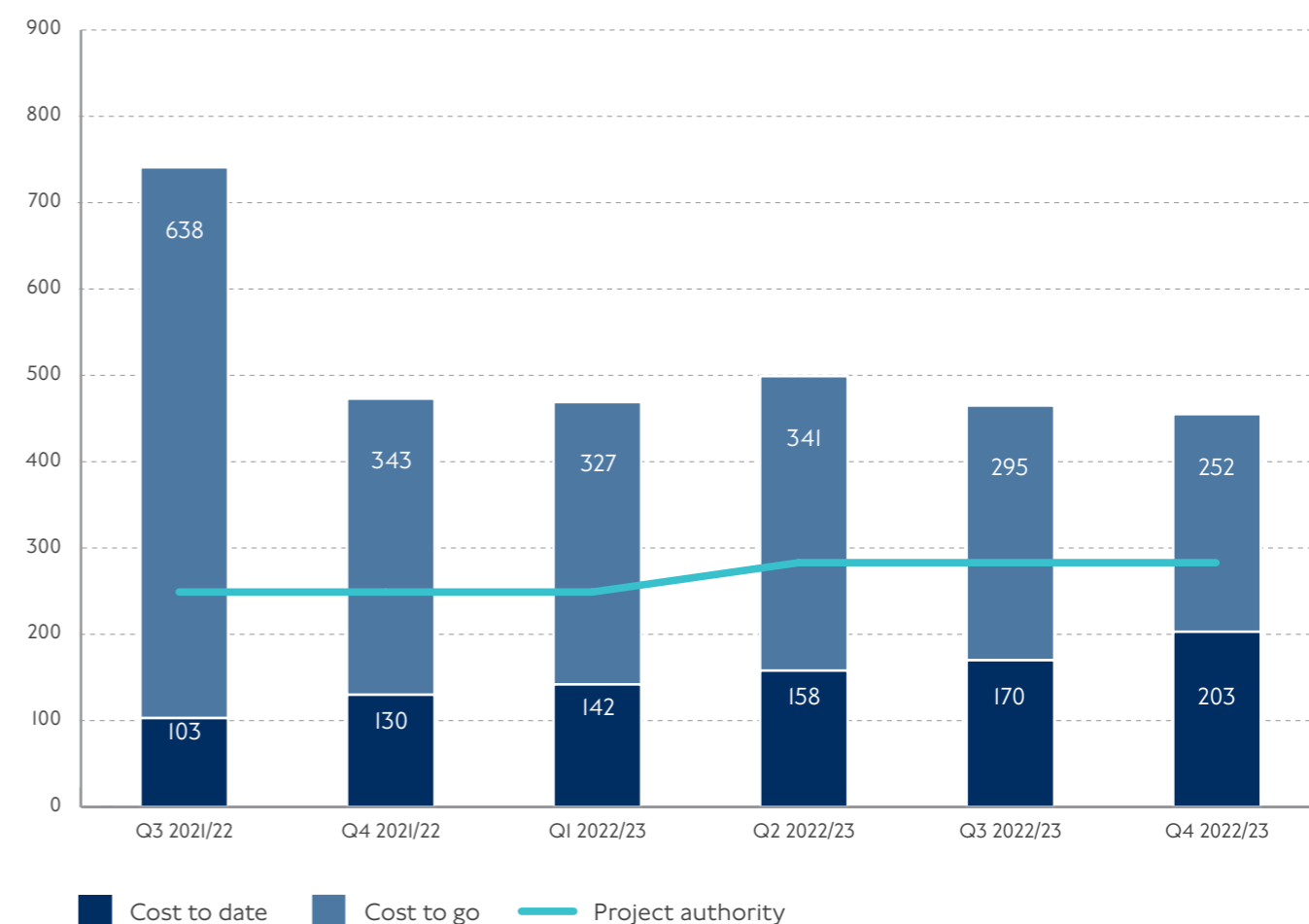
The five-year cost forecast from 2020/21 to 2024/25 has decreased by £12m since the last report, to align with the 2023/24 renewal asset prioritisation and the delivery across enhancement projects including third-party initiatives.

The Quarter 4 forecast reflects a decrease of £8m for renewal delivery, which includes £4m of efficiency savings delivered across the portfolio in 2022/23. The upcoming 2023/24 reduction in outturn is aligned with the strategic exercise to prioritise assets across TfL to ensure all our assets including the rail network remain safe and reliable.

In addition, delayed mobilisation defers £5.9m into future years for the DLR Royal Docks and Royal Victoria station upgrades, due to ongoing discussions to agree funding of scope. This enhancement programme is aligned with the emerging aspirations of the Royal Docks and Beckton Riverside Opportunity Area Planning Framework, aimed at improving accessibility and reducing congestion to enable the delivery of an additional 3,000 homes.

The Surrey Quays station upgrade workstream, part of the East London line Housing Infrastructure Fund programme, reflects the updated supplier programme following contract award in December 2022, with £1m moved into 2025/26. The Bus customer action plan has released £1.9m related to operational activity. The above is offset by accelerating other priority schemes and savings achieved.

Estimated final cost performance over time (£m)





We are improving step-free access on London Overground

### Performance over time Commentary

Over the last six financial quarters, our forecast expenditure has seen a general decreasing trend, driven by funding challenges as a result of the coronavirus pandemic. This has led to several projects being deferred.

### Programme update London Overground

Funded by the Government's housing and infrastructure programme and contributions relating to section 106 planning obligations, we are providing enhancements at Surrey Quays London Overground station, including a new station entrance and step-free access along with power and signal upgrades to enable more frequent services, which will support more housing and economic growth.

Morgan Sindal has now been appointed contractor for the detailed design and delivery of the works at Surrey Quays station and early works began in May 2023 with completion expected in 2026. The detailed design is progressing well, with site surveys and investigations under way and planning permission secured in January 2023. We are undertaking procurement for the delivery of the signalling power upgrade works which are expected to start later in 2023.

### Class 710 trains

Manufacturer Alstom has delivered 51 of 54 Class 710 trains to London Overground. The next train is expected to be accepted in Quarter 1 2023/24, but the last two will be further delayed into Quarter 2 2023/24 because of persisting material shortages for rectification of build-quality defects.

### London Overground renewals

Renewals delivery has been accelerated during the last quarter with contractual commitments of around £800,000 agreed. Works delivery in the last quarter has included successful implementation of the telephone switching upgrade and the lineside and station supervisory control and data acquisitions renewals, both of which were carried out during an extended closure of the East London line during the weekend of 18 to 19 March. The lift renewals have also been completed; the final lift was completed on 6 April. The stabilisation works and new mess room facilities at Stamford Hill station have also been completed, enabling the station to be returned to full operational use.

Notable updates on the complex renewal schemes include:

- Reconfiguration of operational building complex accommodation was completed on site as planned in March
- Renewal of the East London line signalling control system received authority to award the contract for its design and build
- Authority was granted to award the supply of materials to replace over 3,000 track baseplates in the Thames Tunnel; work is ongoing to secure possession access over the 2023 Christmas period to undertake this vital renewal work
- Software build for the Class 378 train cab simulator renewal continues to progress to plan, with implementation forecast for November 2023

## DLR

Procurement activities for the renewal portfolio continue, with priority given to critical and safety-related projects. The team, including our contractors, continues to assess the impact of price rises and the availability of materials such as steel and other resources in the current volatile market. Retaining key staff is a concern, with several engineers having left the business this period.

The replacement bogie frame project for the B92 train type is progressing well. Wheel slip protection trials have been completed. Software installation has not occurred yet but is planned on all 110 train units.

High-voltage projects were impacted by the UK Power Networks (UKPN) substation fire at Poplar in March 2022, meaning UKPN completion of power supply has been delayed until December 2023, requiring some key projects to be re-programmed so as not to impact services. The Poplar transformer has been installed successfully and is now in service. Six of eight substation battery chargers have been replaced.

Long line public address system installation has begun at three stations. This system is used for station announcements, which are essential for evacuations as the majority of DLR stations are unstaffed.

Automatic people counters at 26 stations have also been installed and commissioned into service across the network.

Canary Wharf and Heron Quays low-voltage renewals have started works on site after designs approval. We will replace old lighting with new LED fittings and expect to see significant drops in our consequent power usage at these key stations. Issues have arisen with the suspended ceiling at Canary Wharf requiring replacement, which the contractor is assisting with Canary Wharf management to resolve.

Designs have been submitted for platform resurfacing to make sure the following stations are compliant with slip-resistance standards: All Saints, Royal Albery and Prince Regent. Works have been completed successfully and earlier than planned at Limehouse Arch, this spanned over the canal, which required working closely with Canal and River Trust.

All planned tack fixing works have been completed with over 8000 baseplates renewed over three years. Switch and crossings renewal of three point ends outside Beckton depot on the mainline was completed in one weekend possession, with innovative delivery methods by the contractor and DLR Projects teams meaning work that normally would have taken four days was completed in two. We also completed re-railing between Canning Town and Star Lane during engineering hours with nearly 1km of rail replaced.

The lift system upgrade project continues to make good progress. Works have started on lift 29 out of a planned 30. Escalators at Cutty Sark and Tower Gateway stations return to service following refurbishment this period. South Quays escalator refurbishment has begun.



Modernisation of the DLR will bring safety improvements

The GLA-funded Royal Docks stations programme has completed concept design for capacity enhancements at Pontoon Dock. We are undertaking a value-engineering study to bring down increased costs during Quarter 1. We have completed a feasibility design for a new station at Thames Wharf and are now assessing value-engineering options before feasibility concludes. We have completed concept design for Royal Victoria station and are reviewing the cost estimate for detailed design and build.

#### London Trams

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 categorisations across our fleets. Early market engagement is complete, which has informed the procurement strategy. It was confirmed at our internal Investment Group meeting that replacement of the CR4000 trams is the preferred option; however, full funding for replacement of the trams, alongside our other rolling stock, has not yet been confirmed.

Initial assessments of infrastructure requirements to facilitate a new fleet have also been completed, which have informed the overall programme update.

Installation work for both the wayside and on-tram upgrades to communications equipment was paused in December 2021 so that the project team could investigate and rectify an increase in the number of communication faults, which are affecting the reliability of tram operations. Wayside site installation works are now complete, and we have begun deployment of a correct-side door enabling system on the Bombardier CR4000 trams.

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

The first phase of the Mitcham to Mitcham Junction ballasted track renewal was completed as planned during a 10-day part closure of the tramway from 4 to 12 April 2022. The second phase was delivered during another 10-day part-closure of the tramway from 22 August to 1 September 2022. The final phase was delivered during a planned 12-day closure from 8 to 20 February 2023. We are currently reviewing opportunities available to complete Mitcham to Mitcham Junction follow-up tamping and drainage works and Wimbledon rerailing during an eight-day closure from 5 August 2023.

The tender process for a new framework contract for embedded track renewals was concluded in June 2022, and the contract was awarded in August 2022. The original plan was to deliver Church Street track renewal as the first package under this contract in October 2022; however, this was completed in April 2023 owing to delays for materials with a longer procurement lead-time to delivery.

We completed site investigations to replace the retaining wall and step-free access ramp at Birkbeck tram stop, as a result of which an updated design is required. The delivery contract is in place but on hold until design is complete. Works are due to start on site in Quarter 2 2023/24. This is to allow for an additional utilities survey to take place to facilitate lowering of shallow services by the utility companies, and for the contractor to adequately protect mature trees within the worksite.

Following detailed investigations and assessment of asset condition, we accepted the recommendation to proceed with replacing the underframe of Tram 2547 (Bombardier type tram) and instructed Alstom to proceed with the works to return the tram to service in August 2023. Factory inspection of the centre casting at prototype stage was approved on 22 February which will enable Alstom to progress the manufacture process.

In May 2022, we awarded a contract to start planned works to replace fire doors at the London Trams depot and ensure compliance with current fire safety standards. However, due to supplier delays, works only started in February 2023.

In June 2022, we concluded the tender process to refurbish key components of the CR4000 Bombardier tram fleet (flooring, doors and rooftop), and awarded the contract in August 2022.

The passenger information display on the Stadler Variobahn Trams was replaced in December 2022 and is now in use.

#### Woolwich Ferry (London River Services)

The Woolwich Ferry resilience and renewals programme is made up of schemes spread across several disciplines, which are all currently at various stages of the project delivery lifecycle.

The key aim of these schemes is to reduce operating expenses, maximising use of assets and exploiting opportunities to generate additional revenue where possible. Projects in the resilience and renewals work bank support the delivery of the Woolwich Ferry business strategy, improve operational safety and make services more reliable.

The key focus over the last few periods has been planning and preparing for the blockade delivery which took place late between late February and March. This included the critical delivery of the guiderails plate repairs, welfare unit upgrades, north terminal road works and resurfacing works at both south and north viaduct roads. We successfully delivered these works as per the programme and services were able to start running earlier than publicly announced by two days (opening on 6 March rather than 8 March).

Additionally, the past few periods have been focused on confirming the schemes to be delivered in the financial year 2023/24 including budget allocation for these. This has involved the delivery team working together with the Woolwich Ferry and Asset Investment teams to prioritise schemes based on necessity and delivery confidence. High-priority schemes highlighted as critical for delivery in 2023/24 include the dry-docking and refit of the vessels and the linkspan maintenance works. Other schemes still in development but also raised as priorities include the linkspan and maintenance shed refurbishment, south layby berth and auto-mooring system reviews.

We have awarded the contract for the linkspan renewal and maintenance and mobilisation will now start. The vessel dry-docking scope definition has been completed and these works are now out to tender with dry docking planned for Quarter 4 2023/24.



We are working to improve performance of the Woolwich Ferry

# Technology

Reporting period	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: Forecast vs authority (£m)
2020/21 to 2024/25	85	148	233	173	(60)
<b>Change since last Investment programme report</b>					
No change	12	(15)	(3)	No change	

## Financial commentary

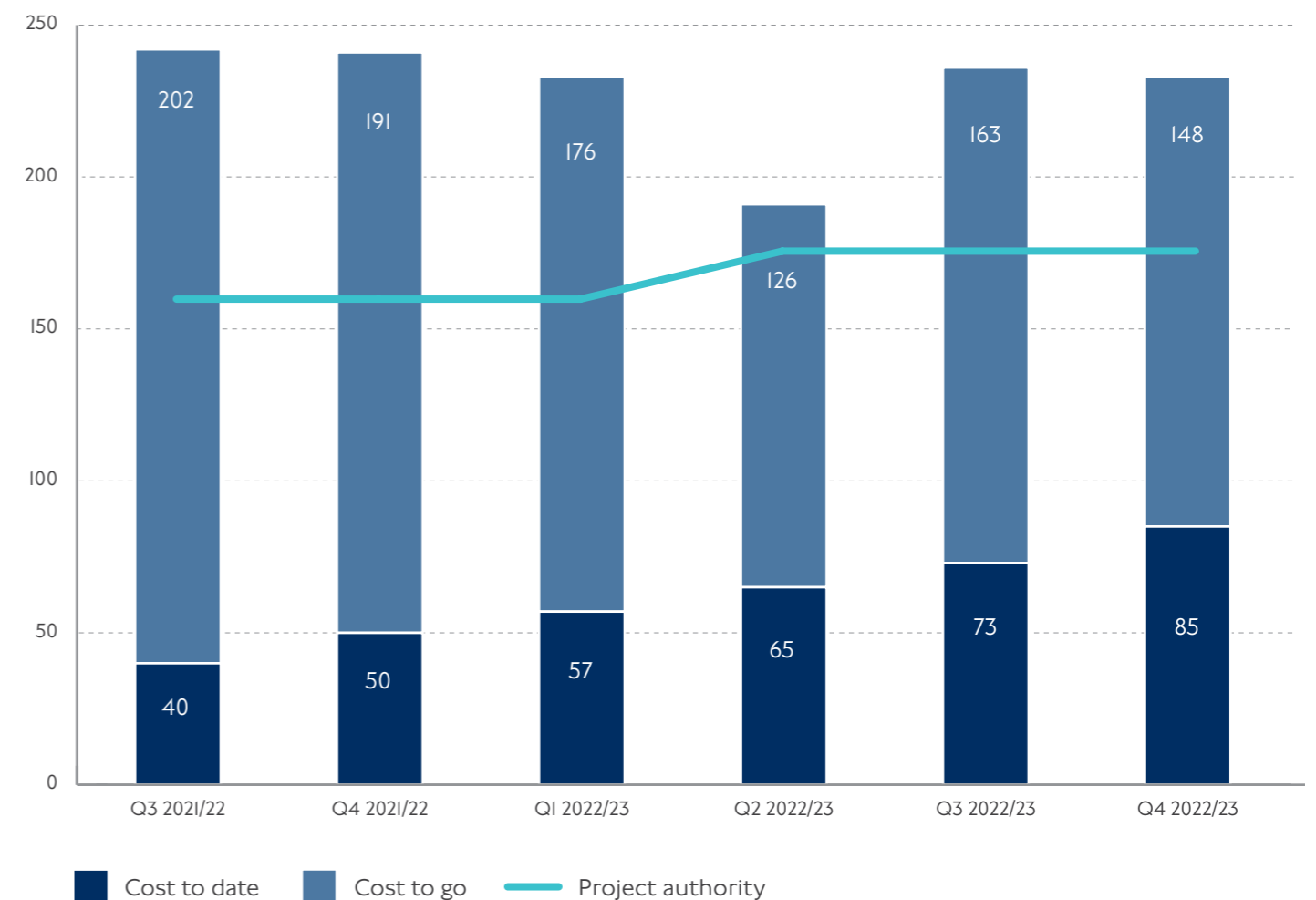
The five-year forecast for 2020/21 to 2024/25 has reduced by £3m since the last report. This is primarily due to re-phasing across the portfolio in line with the prioritisation exercise which was finalised in January 2023.

The £60m variance to forecast versus authority is due to programme and project authority only being sought for 2022/23 and future known commitments in subsequent years, whereas the forecast cost is to the end of 2024/25 for all known expenditure.

## Performance over time commentary

Over the last four quarters, forecast spend for surface technology was significantly reduced to reflect our ongoing funding constraints. This meant that only the enhancements required to secure legal compliance or future financial sustainability could be progressed. However, since Quarter 2 2022/23 and finalisation of the Business Plan 2022/23 to 2025/26, and the overall renewals funding of £725m approved in January 2023, many projects have re-mobilised allowing the portfolio to be able to continue to meet contractual, safety and legal obligations. Further programme and project authority is being sought at the July Programmes and Investment Committee which will address the shortfall of £60m through to 2024/25.

Estimated final cost performance over time (£m)



## Programme updates

### Compliance, enforcement and safety technology

We are continuing to progress the roll-out of deployable enforcement cameras on our road network. These cameras enable us to target specific safety and non-compliance hotspots and are expected to make a significant contribution to helping us meet our Vision Zero goal. They are currently operational at 43 high-priority locations, selected on the basis of their recent safety and compliance records and have already resulted in more than 50,000 penalty charge notices being issued. We are now closely monitoring changes in driver behaviour and road safety, with early indications suggesting that the cameras have already delivered significant benefits with improved compliance at multiple sites. To build on this early success we have begun a second phase of camera installations, aiming to further expand their use across London. We have already identified sites for a number of cameras to be installed in 2023/24 and have started site enablement work and installations. We expect this to result in the delivery of an additional 265 sites by April 2024.

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

As part of delivering the workplace violence and aggression strategy, the operational staff safety programme has rolled out an additional 200 body worn video cameras to staff across TfL and significant progress has been made to roll out 500 emergency communication devices by the end of 2023.

### Road technology

We are leading the way in delivering innovative new road management systems. These are delivered within the surface intelligent transport systems programme and will enable a multi-modal approach to managing the road network. The programme continues to deliver the two core replacement systems, including the real-time optimiser to manage traffic lights more effectively, and the common operating view incident management system to enable more effective management of incidents. These systems will reduce delay and improve journey times. Both projects are prioritised as operationally critical renewals.

In February 2023, we completed all the code required for the final release of Phase I (R6) of the common operating view incident management system, achieving the tier 2 milestone.

We continue to receive positive feedback on the system from users.

We will complete core development of the real-time optimiser system in 2023 will begin migration to live operation of the system in Quarter 4 2023/24. Further enhancements to the system are planned for 2024.

Two further elements of the surface intelligent programme were paused last year but have been reinitiated with an aim to formally start in the new financial year (2023/24). The first of these elements is predictive, which aims to forecast the impact of an incident to improve response times and reduce delays; the second is video analytics, which will provide improved real-time modal data on road use across London.

### Public transport technology

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. The tender process to select suppliers for the iBus2 software replacement project is progressing.

The past few months have concluded the competitive dialogue for iBus2 with the invitation to submit final tenders issued in February. Our focus has been on responding to requests for clarification from the bidders following their review of the documentation. The clarification period is now closed and we have begun evaluation of supplier bids.

Procurement has progressed for the new Countdown 3 system. Recent changes to the strategy have meant that suppliers are able to respond with an option to replace the entire asset if this proves better value for money. The selection questionnaire was released to market on 14 April with all responses received by 30 May. The evaluation period has now begun alongside business case development to appraise the best option ahead of contract award in January 2024. Feedback on new sign types was sought from the Independent Disability Advisory Group (IDAG) on 20 April. The IDAG feedback was positive as we had engaged ahead of contract award and they provided various considerations to make the displays more accessible. A visually impaired member of IDAG will be assigned to work closely with us on the project, to review the Equality Impact Assessment and the alternative screen types to help inform the contract award recommendation.

Procurement has progressed for a replacement booking and scheduling system for Dial-a-Ride, which will give passengers the option to book online and enable us to deliver more trips with the same number of vehicles. We invited shortlisted bidders to submit final tender in April 2022. Following this, we have selected a preferred bidder and the contract has now been signed. Delivery began in March 2023.

### Micromobility

The London e-scooter rental trial has been operating for more than 19 months, with 10 participating London boroughs making up a continuous trial area. In the period ending 12 March 2023, 70,000 trips were made with a total fleet size of 4,490 vehicles. This brings the total to 2.3 million trips for the trial to date. In response to recently updated Department for Transport guidance that allows e-scooter trials across the UK to run until 31 May 2024, we launched a competitive procurement to select operators for the next phase of the London trial. The current contracts with operators Dott, Lime and TIER were extended to continue services until this procurement is complete.

In the 2022 Queen's speech, the Government proposed legislation to legalise e-scooters and grant powers to strategic authorities to manage rental operations for micromobility. Although the timing of this regulation is uncertain, we continue to advocate for this legislation to enable us, working closely with London councils and boroughs, to apply the same approach we have taken with e-scooter rental to all micromobility rental services in London, specifying standards and how operations should work in London, including parking.

### Santander Cycles

Over the last 12 months, the Cycle Hire scheme has seen 10.8m hires take place. This was the third busiest financial year for hires. It was supported by the delivery of the modernise, electrify, expand programme, which saw the launch of a new back-office system, 500 e-bikes and seven new docking stations in the London Borough of Southwark. E-bikes have surpassed 250,000 hires and are being used twice as regularly as classic Santander bikes.

Preparation is under way to procure a new operating contract for the Santander Cycles scheme, as the existing contracts expire from 2025. A prior information notice was issued in April 2023.



Santander Cycles has undergone significant modernisation this year



# Professional services

This comprises Technology and data, media and the TfL Growth Fund



# Technology and data

Reporting period	Gross cost to date (£m)	Gross cost to go (£m)	Forecast cost (£m)	Programme and project authority (£m)	Variance: Forecast vs authority (£m)
2020/21 to 2023/24	238	104	341	359	18
<b>Change since last Investment programme report</b>					
No change	44	(43)	No change	No change	

## Financial commentary

The programme and project authority and forecast figures shown are for financial years 2020/21 to 2023/24 and include additional authority approved by the Programmes and Investment Committee on 2 March 2022. There has been no overall change to the forecast cost since Quarter 3.

The values are for technology and data-funded projects only and exclude the emergency services network, the public cellular network, telecoms commercialisation projects and work to expand pay as you go.

The forecast to authority variance is predominantly due to the outcome of capital prioritisation and reflects savings and deferrals out of the time-frame.

## Performance over time commentary

Costs have remained stable this quarter.

## Progress update

### Payments

In January, we withdrew the last of the legacy passenger ticket inspection devices. These devices were created specifically for crew-operated buses when Oyster was introduced and more recently have been used to facilitate using Oyster to pay for some leisure cruises operated on the River Thames. Following the withdrawal of Routemaster operated bus services, we withdrew the devices completely to reduce the complexity created by small numbers of legacy assets being used to support the revenue collection system.

On 27 February we successfully implemented an upgrade to the payment gateway that supports Oyster online. This was an essential upgrade without which, from April this year, we would have been unable to process payments for season tickets or Oyster top-ups made either through the website or the mobile app. This upgrade was also an essential precursor to placing multi-factor authentication into the log-in processes for Oyster and contactless customer accounts, which went live on 15 May 2023.

## Digital workplace

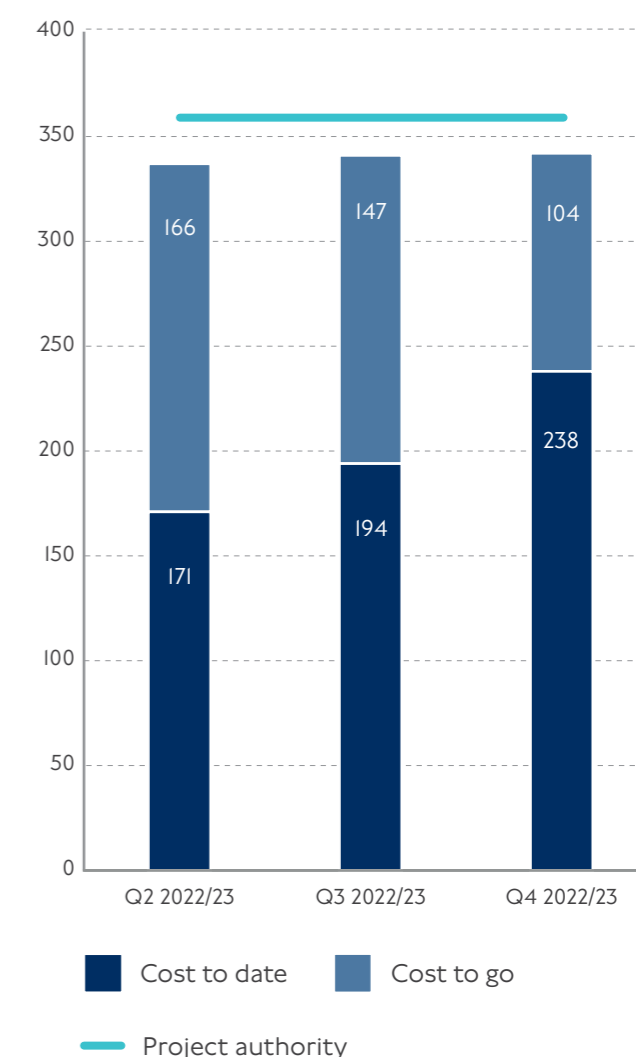
We have formally notified the market of our intention to tender key telephony services during Quarter 1 of 2023/24. These services consist of:

- Telephony maintenance and support, comprising all fixed telephony services and components across TfL
- Modernisation of the operational telephony estate, used primarily by London Underground

We have upgraded the auditorium facilities at Endeavour Square with new audio-visual technology, allowing the facilities to either operate as three separate smaller auditoriums, or to be combined as one large auditorium. This will be our flagship auditorium facility, to be used for both internal and external events. Included within this modernisation initiative is an enhanced support service, which ensures that events hosted within the auditorium always have a dedicated support engineer available.

We have implemented a suite of compliance and reporting tools covering Microsoft PowerApps across our estate. These tools provide complete visibility of all PowerApps activity across TfL and help ensure that new PowerApps are routed through appropriate governance and compliance controls, covering areas such as GDPR, safety and service criticality. This implementation is a foundational step in our evolving Power Platform strategy, which will be progressed throughout 2023/24.

## Technology and data performance over time (£m)



Initial environmental benchmarking has been completed for end user computing and hosting devices. This work has been undertaken in partnership with a specialist third party and is our starting point for continuing to measure and report on carbon output, and ultimately help inform strategic decision making to support improved sustainability. Further work in this area will be undertaken throughout 2023/24.

### Hosting

We have transitioned our end-of-life management process from a project to a business-as-usual activity run by our operations team. At the start of this project 66 per cent of Technology and Data's operating systems and database platforms used to host applications were end-of-life and were no longer supported by the manufacturer. The objectives of this project were to:

- Uplift and/or re-platform our most complex business critical services to supported operating systems and database platforms
- Eliminate security vulnerabilities in business-critical applications due to upgrades not having taken place
- Create an operating model, processes, and procedures for this to be run as a continuous business as usual activity

This objective has now been achieved and the risk has been reduced significantly. A continuous lifecycle management process will now run in business as usual to mitigate the remaining risk.

### Networks

The work to extend mobile coverage beyond the initial Jubilee line pilot area is progressing well, with the first new coverage areas comprising three stations and connecting tunnels on the Central and Northern lines. The first stations and tunnels in this service expansion went live on the 21 and 22 December 2022 with three of the operators (3UK, EE and Vodafone). O2 was added to the network in March 2023 together with the addition of 5G to tunnels and stations for all operators. As station and tunnel builds are completed, further phases will go live on the Northern and Central lines and further significant additions will be added throughout 2023.

We continue to work closely with the Home Office in the delivery of the emergency services network, and we are ahead of schedule to deliver service. The Home Office continues to categorise the London Underground coverage project as green.

The connect programme continues to replace London Underground's operational radio base stations. This two-year project has now replaced more than 277 of 293 (95 per cent) of our base stations, including all 140 locations with an emergency services (Airwave) radio base station.

Our project to replace the end-of-life data network services that underpin virtually all surface services continues to progress. To date, we have migrated 3,914 of 4,427 (88 per cent) sites to the new network delivered by Capita. Of these 3,914 sites, 318 are currently operating on an interim 4G-based solution.



We are upgrading business critical operating systems

### Technology services operations

Our projects to help maintain and protect our business-critical services are progressing well. Of note is the progress being made in modernising our IT monitoring systems, with the key workstream to upgrade monitoring of operating systems now complete. This project continues to improve our monitoring capability through 2023, to minimise any operational impact to technology services and performance. For ongoing provision of our internal IT service management system, we have decided we are able to stay with the current solution in the short-term, while we further review all options on the market. This assessment and procurement activity will continue through this year. A new TfL internal-facing project that we are also embarking on is to agree the IT operating model with our commercial property team.

In our role as a central part of the GLA family, we are also continuing through 2023/24 with the strategic initiative for the GLA IT shared service programme, which will see us assume responsibility for agreed IT systems and services for the GLA, the Mayor's Office for Policing and Crime, and the Old Oak and Park Royal Development Corporation. The plan for this year is to begin the phased roll-out of our IT services to all their staff. We have also been asked to undertake a similar initiative this year for the London Legacy Development Corporation, for which we are now mobilising.

### Enterprise resource planning

Our new procurement and commercial system for purchasing (SAP Ariba) went live with guided buying across our 3,000 purchasers at the end of January 2023. Feedback on the system has been positive and the implementation has highlighted necessary improvements in our business data which over time continued use of the new system will resolve.

We are replacing our legacy HR SAP solution (for which support ends in 2027) by implementing further modules of SAP SuccessFactors, which we call MyJourney.

Phase 2 of MyJourney is now under way. The scope of the project is in two tranches. First, we will replace our core HR system of record and payroll solution, followed by a second tranche that will cover recruitment and onboarding. The project team alongside our delivery partner, Infosys, have completed the Discovery workshops which has identified the core requirements and the areas where we operate our HR processes differently across the organisation. The next step is to review these and decide how we design the solution. The milestone plan is to have the new HR and payroll system in place by Quarter 4 2023/24.

The next key stage of the transformation programme is the upgrade of our core SAP system to the latest version SAP S/4 HANA. The programme team with our client-side partner, Resulting IT, have run several process workshops with key stakeholders and subject matter experts across Finance, Procurement, HR, and Operations. These have identified the strengths and weaknesses of our process compliance and how we manage and use our data. All this information enables us to take the next step, which is to determine the scope and delivery approach for the S/4 HANA upgrade. In parallel, we have issued a market tender prior information notice to suppliers and will be inviting 50 firms to attend a supplier day to promote our programme and the opportunity. This will culminate with a market tender for S/4 HANA implementation services in Quarter 3 2023/24.

### Contact centre operations

Following the historic delivery of a successful outsourcing roadmap, reducing our cost to serve by more than £3m per annum, we have now replaced the outsourcing framework that facilitated this saving. The previous framework expired last year. A replacement was required before the existing call off contracts expire to continue to leverage the per annum saving, to provide service continuity to the outsourced contracts currently live and to provide a commercial vehicle to outsource any additional work. Following market engagement, evaluation of bids from the market and taking the contract award recommendation through governance our new framework is now live.

In addition to providing this critical continuity of service to customers, we have also replaced and improved technology. In our lost property office, we have replaced Sherlock, the primary system used to catalogue items of lost property. This tool was out of support for more than a decade, and functionality limitations prevented us from modernising our processes. Following last year's successful tender of the new tool, we have worked closely with the supplier, NotLost, to ensure the product is suitably rolled out to all operational areas. We have gone live in the lost property office and for our larger modes of transport, including but not limited to London Buses and London Underground.

### Data analytics

We have kickstarted our strategy work with a series of data maturity assessments across TfL using a newly published single government maturity model as a framework. This will help us connect our data communities across TfL to recognise areas of success and good practice, identify areas that need additional support and spot new initiatives to consider. The outcome of the data maturity assessments will be our ability to track improvements in our data maturity over time.

We have taken a prototype of a bus deployment planner component within ITAP (our irregular travel pattern platform) and have made this a production component. The bus deployment planner detects cards which have error taps on buses, to help demonstrate when and where fare evasion is happening on the network. This will now allow colleagues in our fare evasion teams to target deployments using data insights.

Finally, we have also transitioned our re-platformed ODX (Origin Destination Interchange, which combines bus location and ticketing data to estimate where people using our bus network alight) into business as usual, which now ensures that users of this data have a stable platform to help inform business decisions.

### Digital

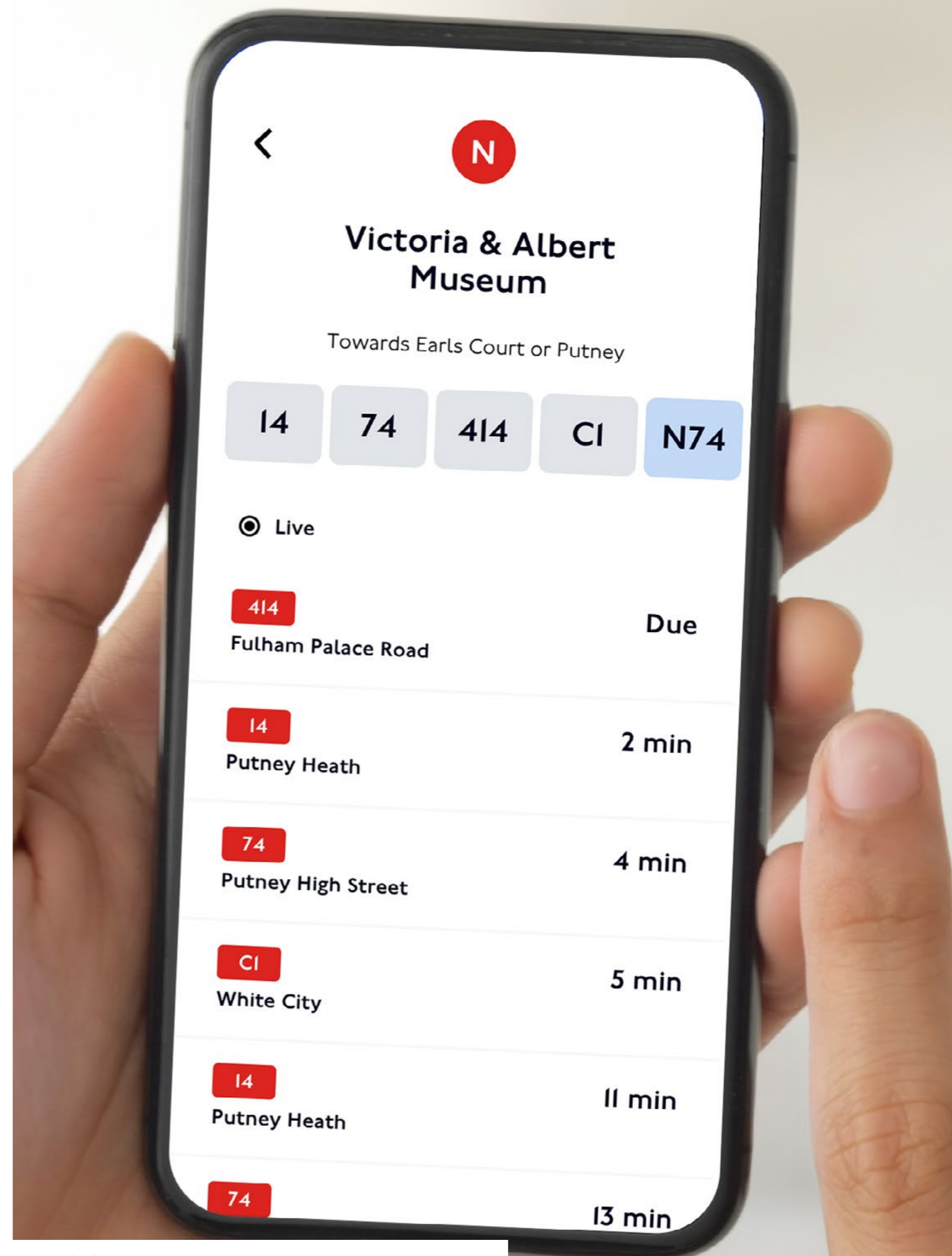
The TfL Go app has now been downloaded over 3.4 million times and was used by just over 601,000 customers in February 2023, up 5.5 per cent on the previous month.

We have continued to release regular app updates, with an imminent release of fares in Journey Planner and enhancements to the live Tube map. In early March we upgraded the Journey Planner engine so that it uses live bus arrival times rather than scheduled times. A similar enhancement for live Tube journeys will follow. In February we published 'promoted places' content featuring things to do in London during the half-term break. We have also begun work on notifications so that we can warn customers in advance about network disruption.

We continue to prepare for the launch of integrated payments functionality and development work is now complete. However, launch is dependent on the rollout of the new account platform and work to correctly attribute payment activity between the apps. The plan is to still first test internally, then widen access to up to 10,000 customers in a beta trial.

### Challenges

Global semi-conductor supply issues have distorted our delivery due to long lead times and pricing that increases at short notice. This has impacted our ability to procure and implement new IT infrastructure and resulted in increased project costs. We have put mitigations in place for our known pipeline and live projects in the networks transformation programme; however, we are still exposed to risk on ad-hoc, small works or emergency works.



Our TfL Go app has been downloaded over 3.4 million times

# Professional services Growth Fund

Reporting period	Forecast £m
2020/21 to 2029/30	37
Change since last IPR report at P3 22/23	
No change	No change

## Financial commentary

The forecast for the Growth Fund is unchanged this quarter. During the Business Plan process, additional funding was identified and prioritised for the Growth Fund and this is reflected in the forecast. This money is profiled between 2024/25 and 2026/27 and will be allocated to specific Growth Fund projects over the coming months.

## Programme update

Over the past two years we have not been able to proceed with Growth Fund schemes as they have been contingent on additional funding being made available. Following the funding deal with Government, the 2022/23 Business Plan has recognised the need for us to continue to leverage third-party income and to support growth and step-free access projects in London. The Tolworth scheme remains in the Growth Fund budget as a commitment.

## Challenges

The main challenges continue to centre around ongoing funding uncertainty for third-party funded projects, which are necessary to deliver the Mayor's Transport Strategy outcomes in areas of development and high need in London. Several projects with previously complete funding packages are currently at risk due to the programme being reliant on additional funding.

As a result, a number of projects have been delayed or paused in anticipation of funding certainty, while there have been attempts over the last couple of months to secure alternative funding contributions for some critically urgent projects.



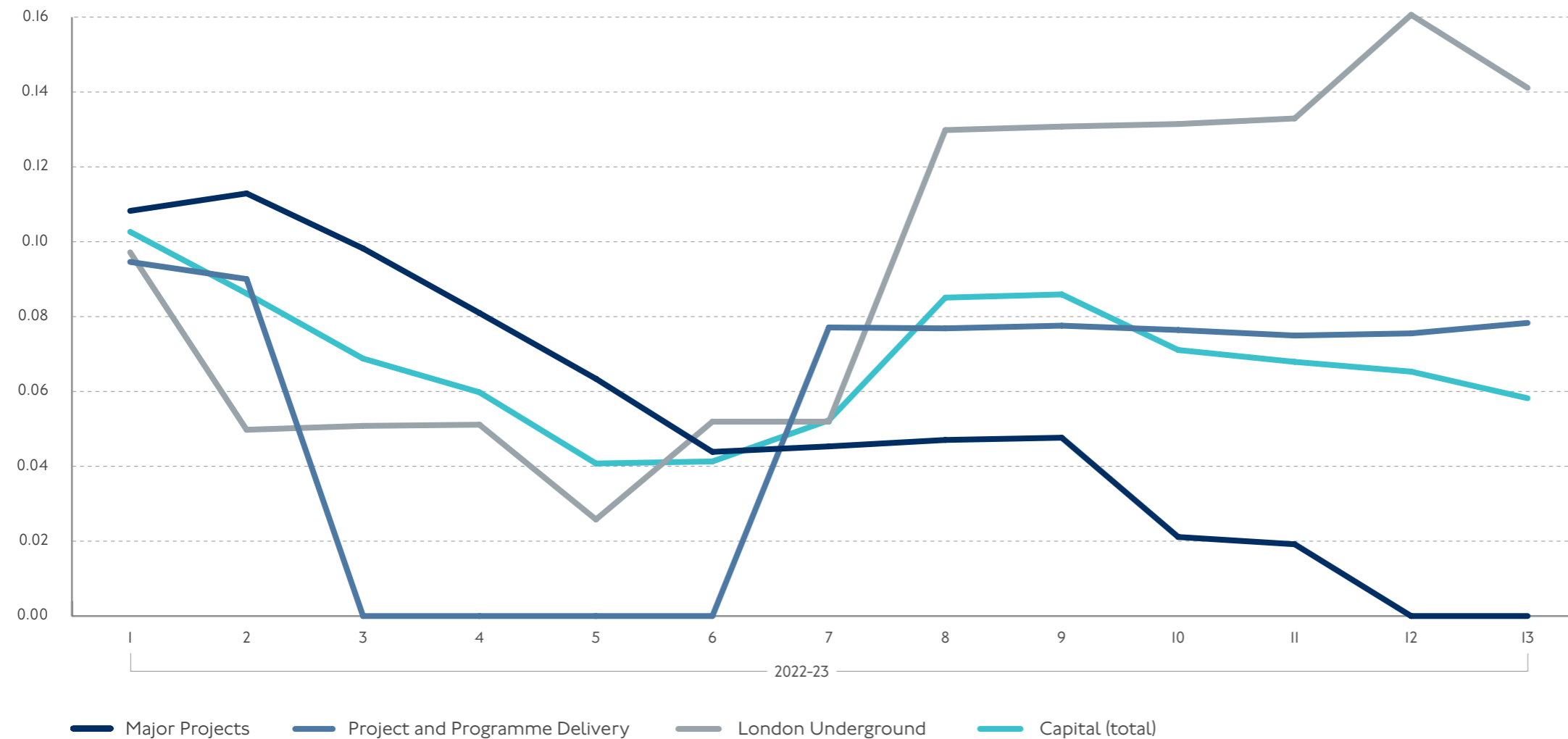
We are aiming to secure funding for critically urgent projects

## Appendix

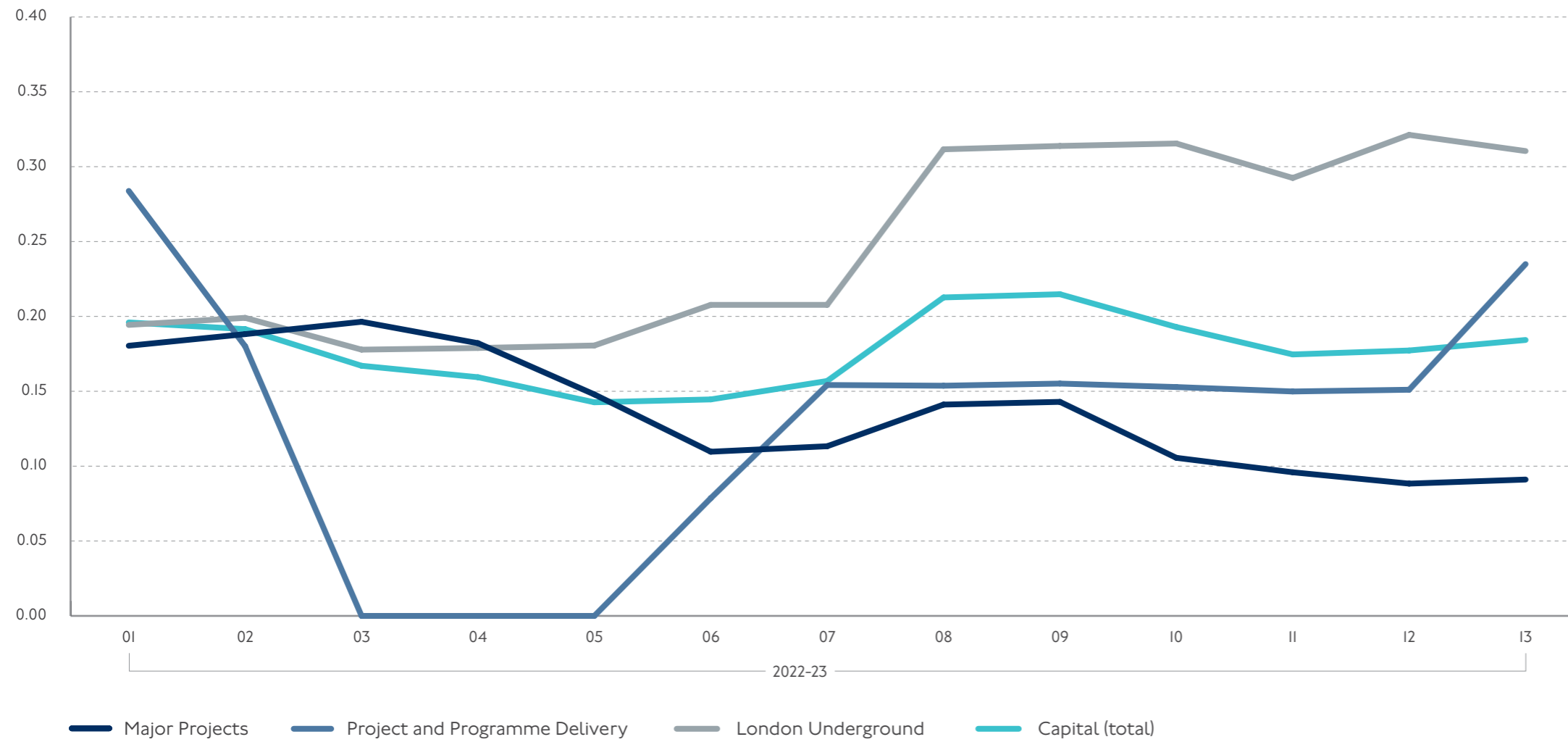
# Our safety performance data

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)

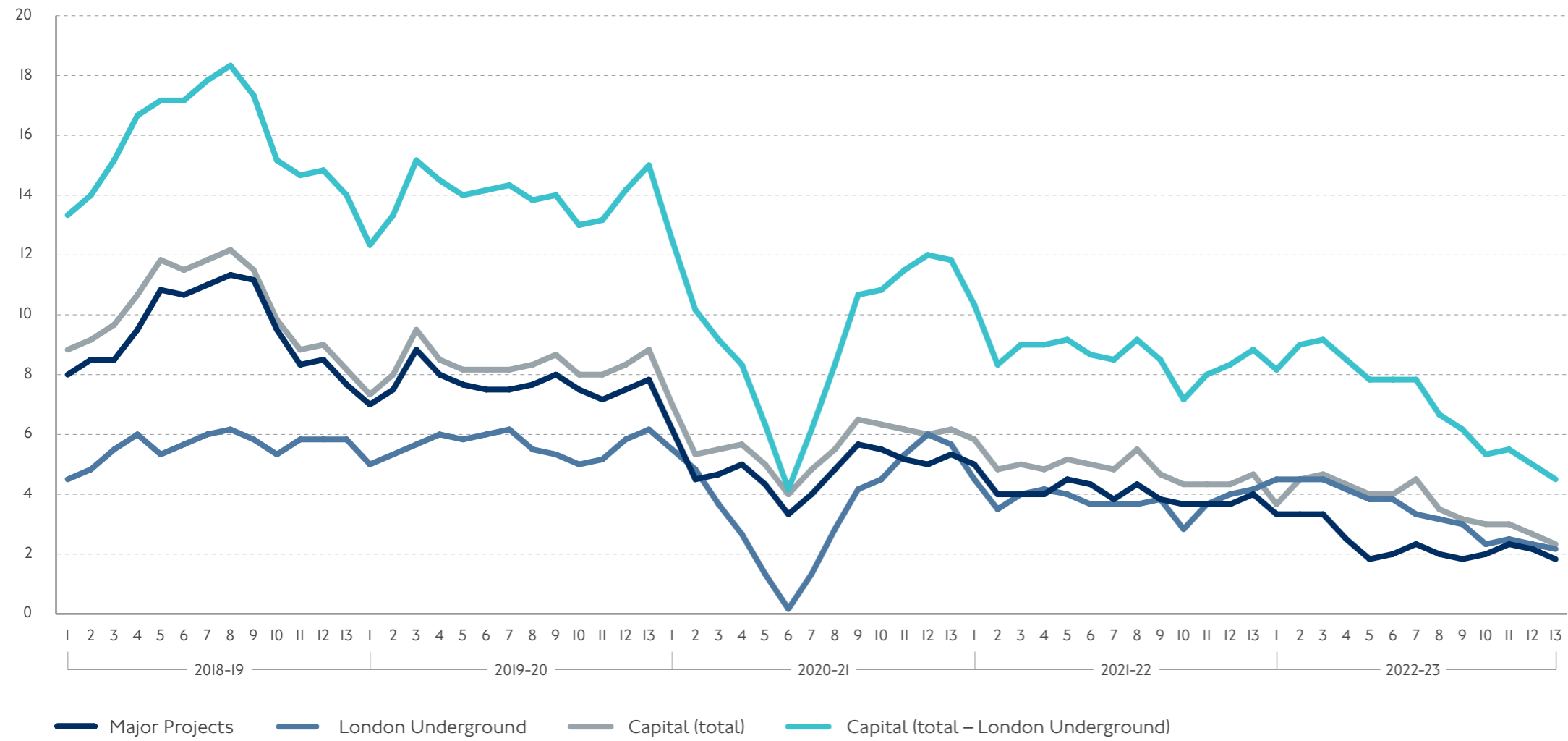


**Lost time injury frequency rate**  
(per 100,000 hours worked)





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



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## 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 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. The experience, reliability and accessibility of these services is fundamental to Londoners' quality of life.

We manage the city's red route strategic roads and, through collaboration with the London boroughs, we are helping to shape the character of all London's streets. These are the places where Londoners travel, work, shop and socialise. Making them places for people to walk, cycle and spend time will reduce car dependency, improve air quality, revitalise town centres, boost businesses and connect communities. As part of this, our expanded Ultra Low Emission Zone and fleets of increasingly environmentally friendly and zero-emission buses are helping to tackle London's toxic air.

During the pandemic, we took a huge range of measures to ensure people were safe while travelling. This included extensive cleaning regimes across the public transport network and working with London's boroughs to introduce the Streetspace for London programme, which provided wider pavements and cycle lanes for people to walk and cycle safely and maintain social distancing. London's recovery is vital to the UK's recovery as life returns to normal. We want to ensure London avoids a car-led recovery and we continue to reassure people the capital and our transport network is safe and ready for them.

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

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

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

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

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