



Investment programme report

| April 2022 – 25 June 2022

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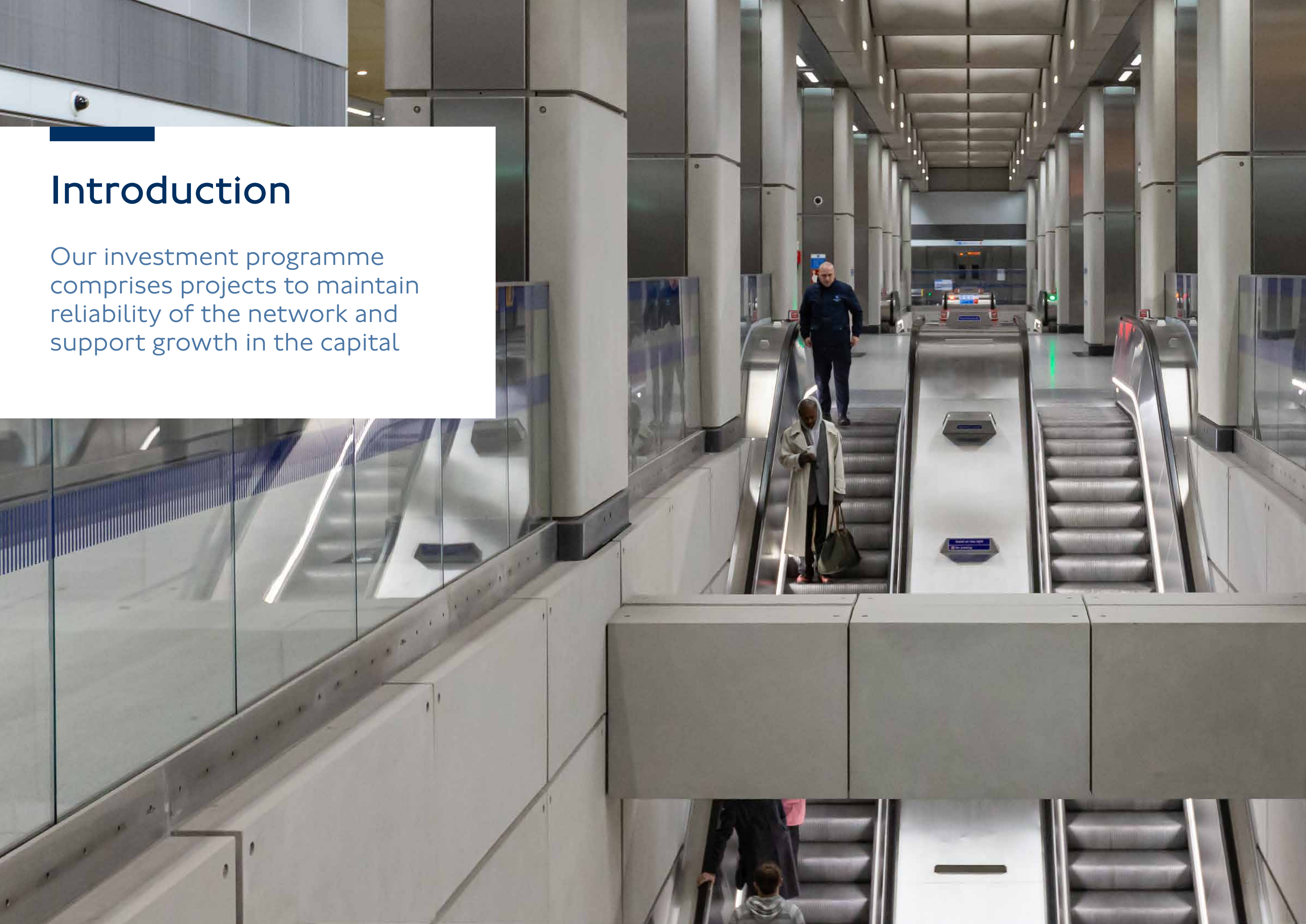
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Introduction

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



Purpose and scope

Purpose

Transport for London 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.

Our investment programme is the suite of projects comprising renewals and enhancements to maintain reliability and support growth in London.

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 supports London's growing population and economy, enhances the quality of life for Londoners, creates jobs and improves skills across the UK.

Scope

This report provides an update on the projects that will further enhance our world-class transport services. It covers Periods 1, 2 and 3, which run from 1 April to 25 June 2022.

For each key project or programme, the financial and milestone data represent the position at the end of the quarter, and include commentary on key achievements, progress and challenges. This report also contains updates on notable progress made since the last report.

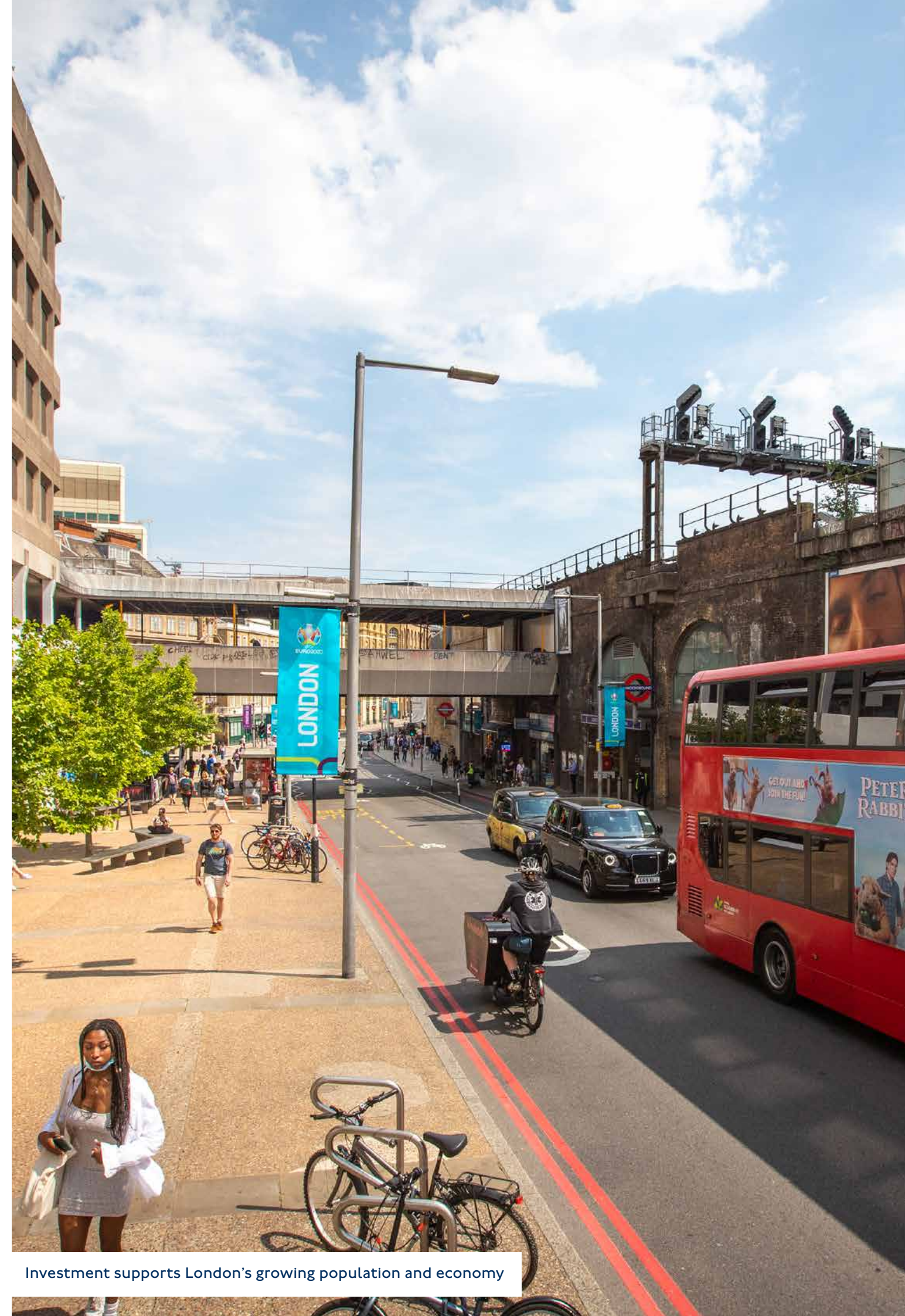
The data displayed differs depending on whether the programme or portfolio has a finite scope to deliver:

- 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 season that the specified project will take place. Winter covers January, February and March; spring covers April, May and June; summer covers July, August and September; and autumn covers October, November and December
- For ongoing portfolios that aggregate a number of different projects, financial records of spend to date and forecast cost are provided for a discrete period of time

Where financial information is commercially sensitive, it has been redacted.

Performance over time graphs illustrate financial performance over the last four quarters. The commentary below the graph explains any specific trends or changes to trends during a snapshot in time.

As a post-quarter update, in August TfL issued an update on its funding agreement with the Government. We expect to receive further base funding of around £1.2bn from Government until March 2024. This report reflects the finances that covered Quarter 1 prior to this new agreement. The Quarter 2 IPR report will provide details of how this agreement will affect the programmes covered here.



Investment supports London's growing population and economy



We deliver major infrastructure projects such as the Elizabeth line

Investment programme delivery structure

Our investment programme is delivered by specific areas of our business, 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.

Our performance

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



Safety performance

In January 2022, the Government removed the mandate to wear a face covering in public spaces, meaning that they were no longer enforceable on our services. This quarter we changed our customer and staff messaging to encourage people to take appropriate action to keep themselves safe, including using hand sanitiser and wearing a face covering if this helps them to travel and work with confidence. In parallel, we have continued to make progress towards our longer-term safety, health and environmental objectives.

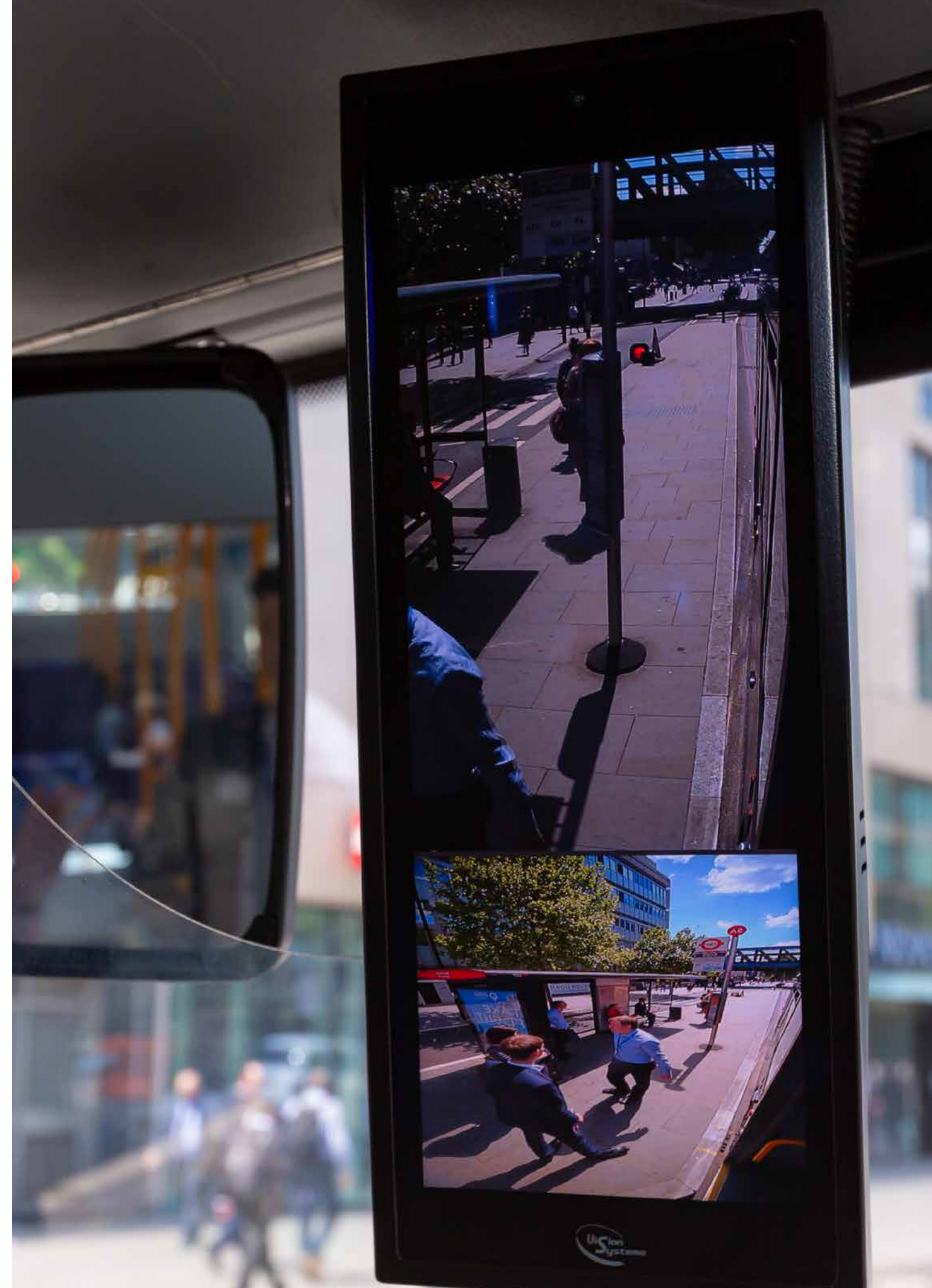
Coronavirus remained the top cause of short-term staff absence, but significantly decreased as a proportion of staff absence: from 59 per cent in Quarter 4 to 30 per cent in Quarter 1. Mental health and musculoskeletal-related health remained the top two causes of long-term absence, which is in line with the national average. Following the Government's decision to phase out free lateral flow tests, we have continued to make them available to our staff.

Capital delivery

Capital works cover a broad range of activities across the Major Projects Directorate, Project and Programme Delivery, and London Underground Capital Delivery. Some are essential asset renewals and maintenance to keep our frontline services operating efficiently. Others represent new and significant investments to improve existing infrastructure.

Quarterly performance

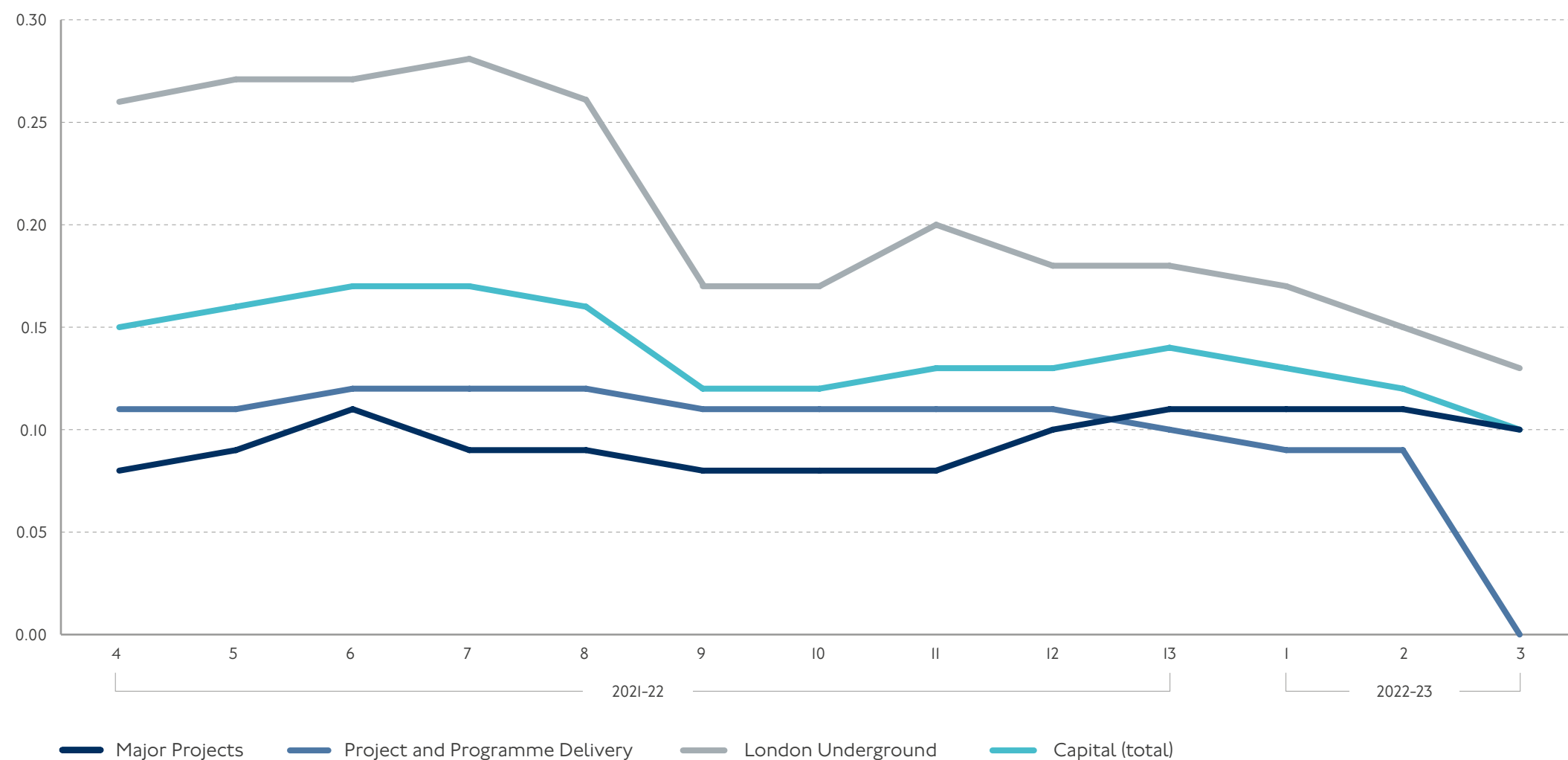
To enable accurate analysis of data, some of our key measurables are quoted as a frequency rate per 100,000 hours worked. Frequency rates are calculated using a moving annual average based on performance over the previous 13 periods.



We measure our safety performance by analysing relevant data

In Quarter I, there were no incidents reported under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) within our capital teams, a significant improvement on the previous quarter. As a result, the accident frequency rates decreased across all of our capital teams, with the overall capital rate ending the quarter in line with our 2022/23 annual target of 0.10. The Project and Programme Delivery team has now maintained zero RIDDOR incidents reported on its projects for one year.

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

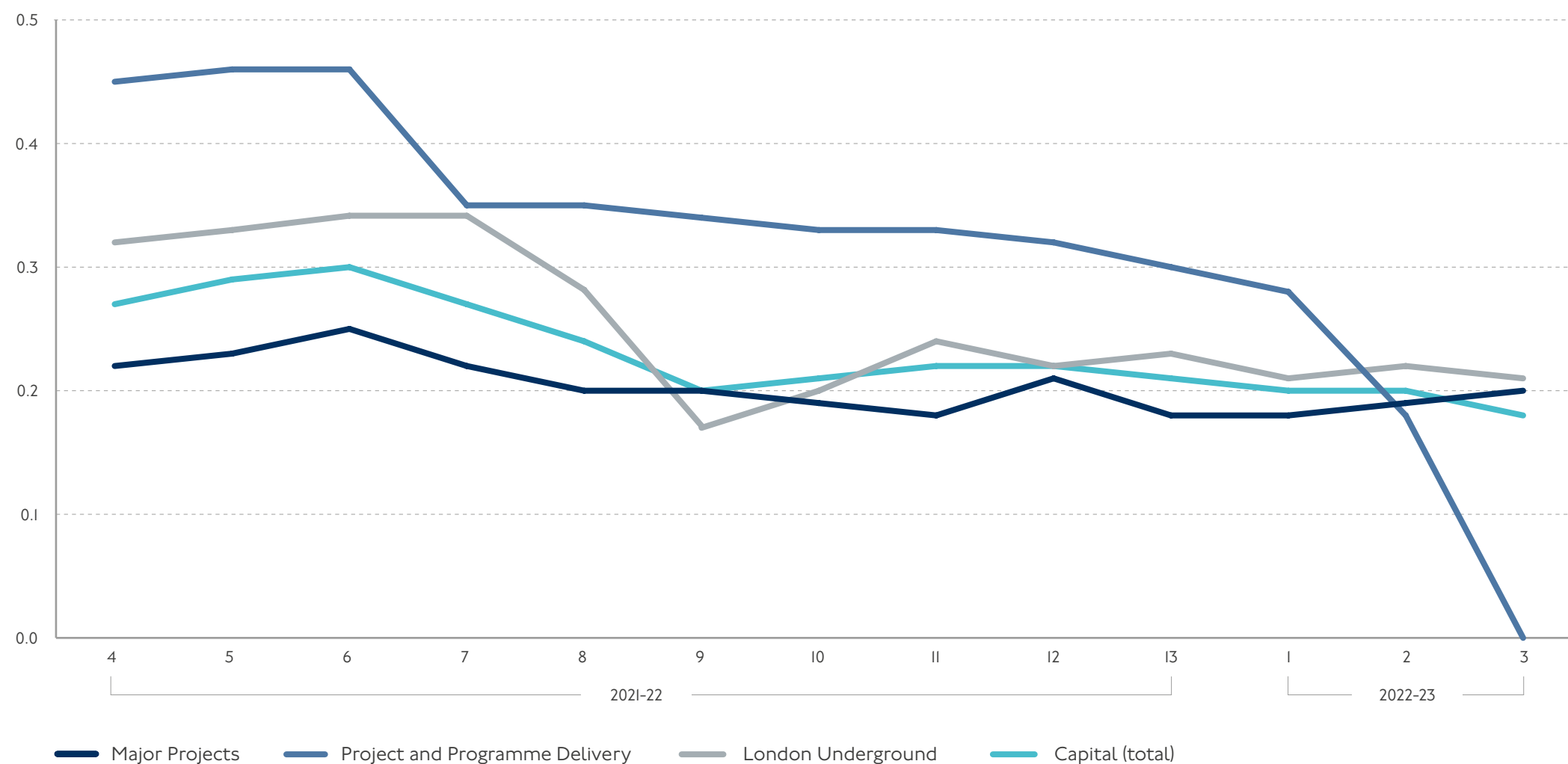


Lost time injuries (LTIs) are injuries that cause an employee to be absent for one or more shifts. There were three LTIs reported in our capital teams during Quarter I, a decrease of four on Quarter 4 2021/22. Consequently, the lost time injury frequency rate for the capital area, and all teams within it, ended the quarter below the target of 0.25. The Project and Programme Delivery team rate dropped to zero, having now experienced one year without a lost time injury reported. Alongside a quarterly fall in the rate of RIDDORs and lost time injuries across the capital teams, this demonstrates positive progress, although down from a relative peak of injuries during the first half of 2021/22.

All three of the LTIs reported during Quarter I were minor injuries, with two classified as slips and trips, and the other classified as a misuse of hand tools. Human behaviour was identified as a contributor to two of the incidents, but a more significant root cause identified across all three LTIs related to issues with task planning. As a result, changes have been made at site level, operatives have been re-briefed, and learnings shared across the capital teams.

Two of the LTIs occurred at the Bank Station Capacity Upgrade project, where an intense period of construction work took place during the closure of the Northern line Bank branch, in order to open the new platform and underground concourse. The closure began in January 2022 and ended in May 2022. Despite the minor injuries reported during this quarter, no major injuries or incidents occurred during the closure, which is testament to the positive teamwork of everyone on the project.

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



Long-term trend

There were 20 injuries reported in the capital area during Quarter I, which is a decrease of 13 on the previous quarter. The number of injuries continues to fall year-on-year and remains well below pre-pandemic levels. This remains the case when hours worked are considered, which have seen a lesser decline over the same period suggesting a continued reduction in the risk of injury. Slips, trips and falls and manual handling remain the most common immediate causes. Due to changes in the structure of our capital teams, numbers in this section of the report may be prone to some fluctuation during the coming quarters.

Total capital delivery physical workforce injuries (six-monthly average)





An upgraded Bank station was reopened in May 2022

Schedule performance

We have achieved a number of scheduled milestones throughout the year

Piccadilly line upgrade

In June 2022, the first car body was built and painted in the TfL livery.

London Underground

In June 2022, seven new escalators were installed and brought into customer use.

Bank station upgrade

Following a 17-week closure, Bank station reopened in May 2022 with the new Northern line passenger concourse now open.

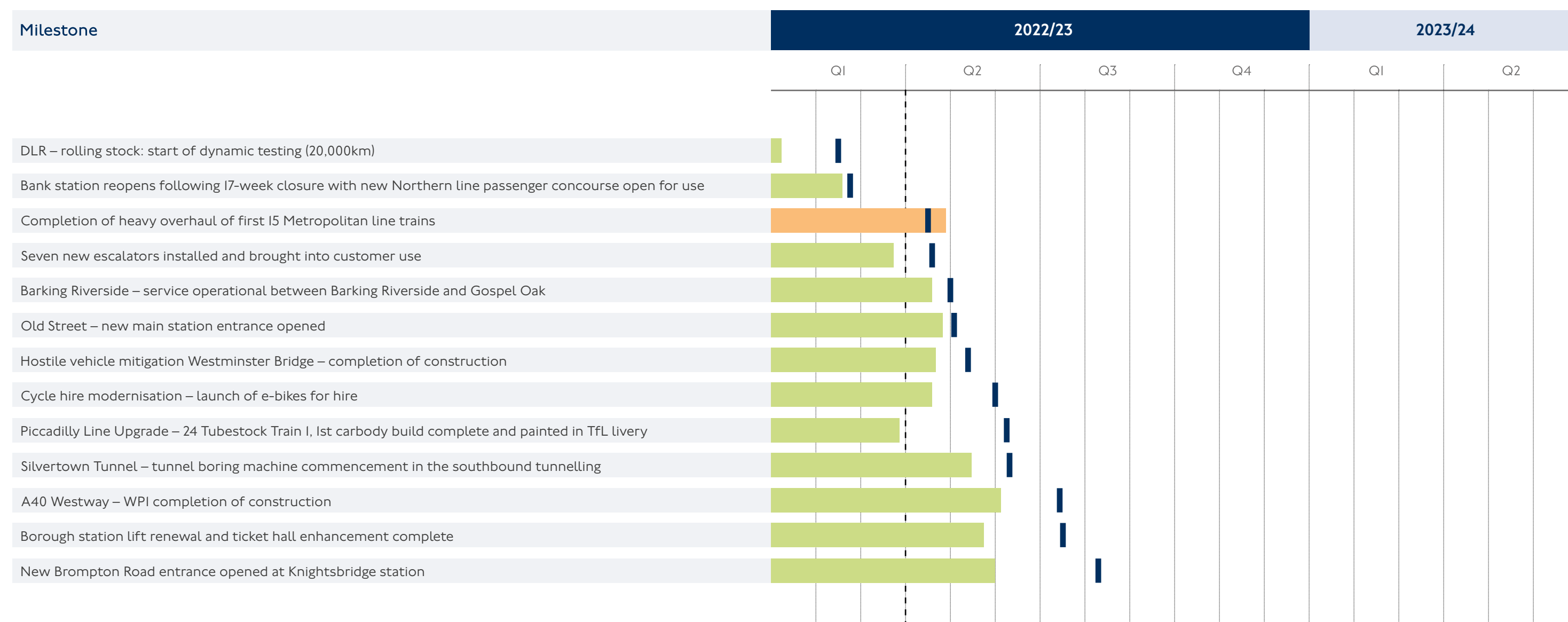
DLR rolling stock replacement programme

In April 2022, dynamic testing (20,000km) started on the new DLR rolling stock.

Strategic milestones

We have delivered 4 out of 21 strategic milestones either on time or early this year

These are our strategic milestones for 2022/23. The hollow box shows when the milestone was due to be met, while the 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 2022

Strategic milestones 2022/23 (continued)



Milestones forecast to be late London Underground

The overhaul of the first 15 Metropolitan line trains has been delayed due to the lack of certain materials such as cable harnesses. This has slowed down production and delayed completion. We are investigating a workaround to avoid further delay, and more harnesses are on order for the remainder of the programme, with delivery expected in September.

Four Lines Modernisation

Signalling system upgrade on District line passenger services between Dagenham Heathway and Upminster (Signalling Migration Area 07).

Since commissioning new signalling across the entire Circle line area in March 2022, the underlying system performance has been good, but through our testing process we've become aware of a software issue, which needs to be addressed.

We are continuing to make good progress on the programme; however, fixing this software issue and ensuring continued focus on driving high reliability means we have undertaken a review with our supplier, and our target for upgrading the final sections of signalling is now between spring and autumn 2025.



New signalling across the Circle line will complete in 2025

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)
Winter 2025	996	10	1,006	1,149	143
Change since last Investment programme report					
No change	3	0	No change	No change	

Financial commentary

There has been no significant movement since last quarter apart from costs to date increasing. This is due to numbers being rounded to the nearest £m, which is not visible.

Performance over time

The forecast end date represents the delivery of Elizabeth line rolling stock and depot, including all additional changes. Since the authority award in 2013/14, our forecast end date has been delayed by approximately four years due to delays to the overall Crossrail programme.

Our authority increased in 2018/19 when five additional units were added. Since the authority was awarded in 2013/14, the EFC has dropped from £1,090m to £1,006m. This is because the trains have subsequently been part of a sale and leaseback arrangement. These trains are now being leased from 345 Rail Leasing Limited on a 20-year agreement and the costs charged to operational costs.

Programme update

Class 345 trains

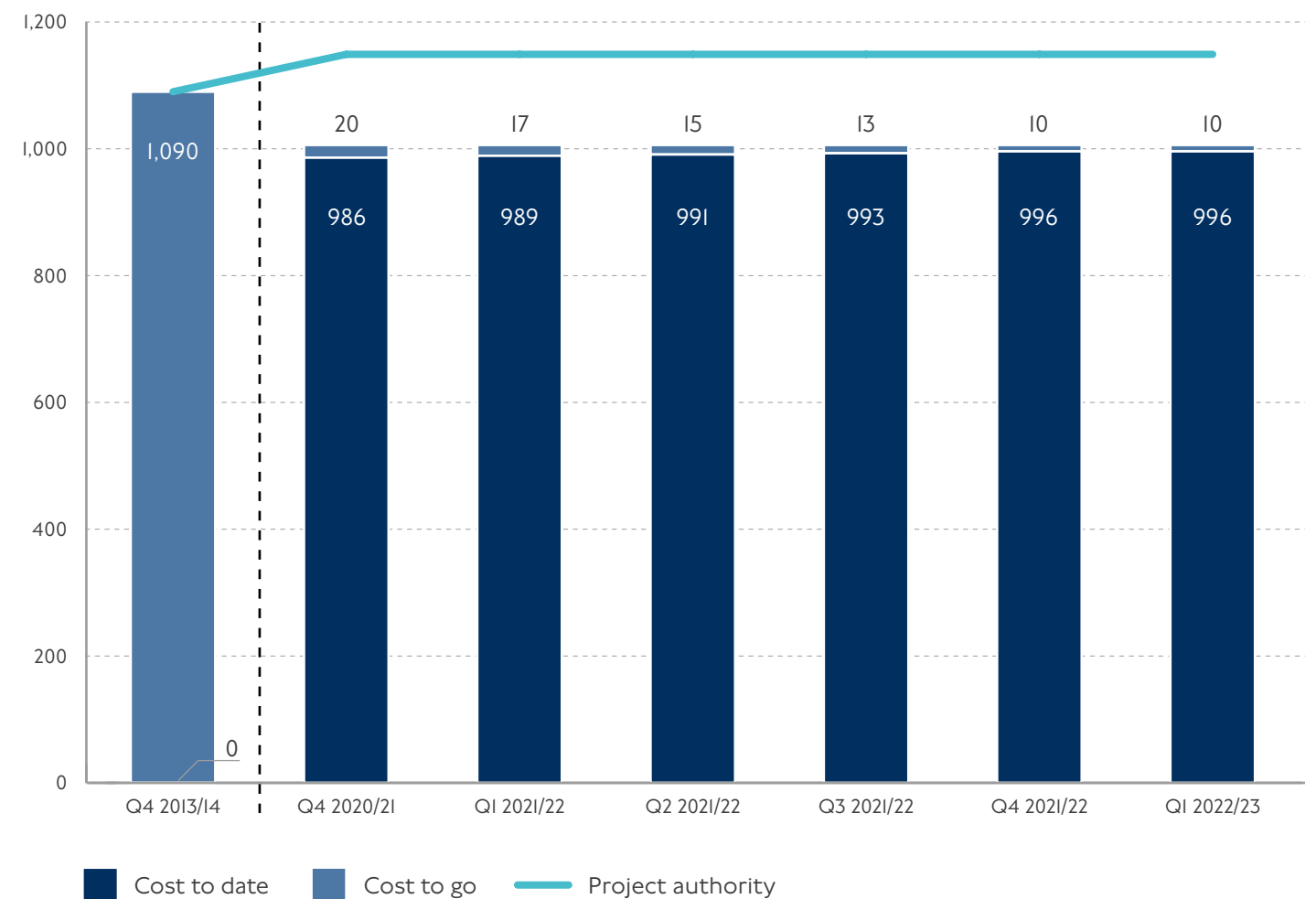
Passenger services between Reading and Paddington are operating with a combination of nine-car and seven-car Class 345 trains. The three remaining seven-car trains will continue to serve the shorter platforms at Paddington National Rail station until the start of through-running services into the Elizabeth line central section later in 2022, when they will be converted to nine-car trains.

Services to Heathrow, and between Liverpool Street and Shenfield, continue to be operated by nine-car trains. The line operates 12 nine-car trains an hour within the central section between Paddington and Abbey Wood, Monday to Saturday from 06:30 to 23:00.

We anticipate progressive incremental updates will continue to be made to the train and signalling systems, and we have provided for this in the rolling stock project through to 2025.

Estimated final cost performance over time (£m)

Forecast completion date



Challenges

Fleet reliability has improved, but not to the level that was previously anticipated. A new suite of reliability-focused software is being installed on the fleet by the manufacturer, Alstom, which is expected to deliver the required improvement.



Upgrades continue to trains and signalling on the Elizabeth line

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)
Spring 2023	15,678	285	15,963	15,789*	(174)
Change since last Investment programme report					
No change	69	(69)	No change	No change	

Financial commentary

The EFC and forecast end date remain unchanged. But there are still risks associated with implementing the additional functionality required to achieve the end-to-end railway, alongside achieving the required level of operational resilience.

Performance over time

The reported forecast end date represents operation of a full service from Reading and Heathrow through the central section to Shenfield and Abbey Wood, with a peak service of 24 trains per hour on the central section between Paddington and Whitechapel.

The original forecast end date was autumn 2019. However, the schedule at that time assumed that installation of critical systems, construction of stations, and testing and commissioning could all be completed in parallel towards the latter stages of the programme. This was ultimately not achievable and led to a delay in completion. In addition, the coronavirus pandemic had an impact on productivity in 2020, although this has been mitigated from a schedule and cost perspective.

Since setting Delivery Control Schedule 1.2 in August 2021, costs have remained largely stable due to active management of the EFC. The programme has been able to realise a number of opportunities and risk retirements over this period through focused cost reduction initiatives and delivering as close as possible to the forecast schedule. But increasing cost pressures in some areas have meant there has been no favourable movement overall in the EFC.

Estimated final cost performance over time (£m)

Forecast completion date



* Excludes on-network works carried out by Network Rail

Programme update

The reliability of the Elizabeth line has been very good since the opening of the central section on 24 May 2022. The Public Performance Measure between Paddington and Abbey Wood was 97.8 per cent over the first five days of service, with 100 per cent delivered for three of those five days.

During the first four weeks of operation as the Elizabeth line there have been some 10.25 million passenger journeys across the whole route. Of these, around five million are estimated to have been on the central section from Paddington to Abbey Wood, averaging more than 200,000 journeys per day.

Work continues during engineering hours and on Sundays to complete outstanding works: in particular, to update signalling software in preparation for more intensive services later this year.

Bond Street is now the only station site with substantial construction, testing and commissioning activity still underway. The station continues to make good progress and the team are working hard to open the station to customers later this year.



Some 10.25 million passenger journeys during first four weeks

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)
Winter 2025	5,170	299	5,469	5,520	51
Change since last Investment programme report					
1 quarter later	30	(19)	11	73	

Financial commentary

The EFC has increased by £11m since the last report. This is due to cost increases, schedule delay and inflation, which have been partially offset by cost reductions and descoping planned works (including Farringdon city sidings) from the 4LM programme.

The forecast delay to completion of the final Signal Migration Area I4 (SMAI4) from autumn 2024 in the last report to early 2025 has come principally from a revised assessment of the most likely timescales to develop, test and commission the software. There is also limited availability of the closures required to complete the remaining areas of signalling upgrade.

An extensive review of cost and time has been undertaken, which informed an increase in programme and project authority, which was approved at the July

Programme and Investment Committee (P&IC) meeting.

Performance over time

The forecast completion date shows when the final SMAI4, between Rayners Lane and Uxbridge, will be brought into service.

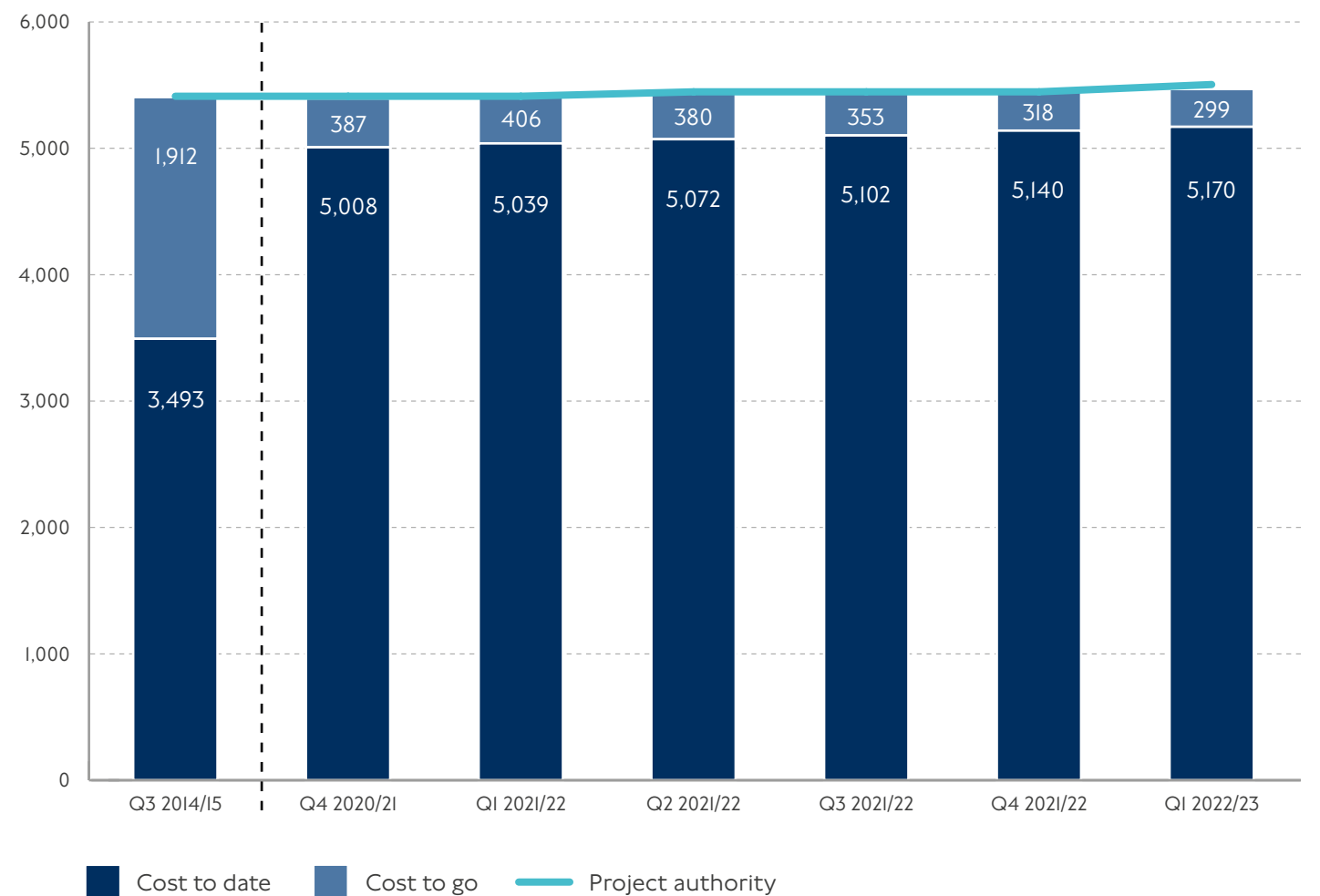
Since the award of the signalling contract in July 2015, our forecast completion date for SMAI4 has been delayed, and is now expected to be delivered in early 2025. The delays are principally due to challenges with complex software development, testing and commissioning, closure availability and the impact of the coronavirus pandemic.

Our estimated final cost has been updated to reflect the outputs from the detailed review of the remaining scope of work, particularly associated with the software programme, and associated risks that informed the request for increased Programme and Project Authority in July 2022. Risk of prolongation from early 2025 to autumn 2025 is not reflected in the EFC but is included in the Programme and Project Authority.

* Following the close of the reporting period (Periods 1-3), approval was given to increase programme and project authority at the 20 July 2022 P&IC meeting. Figures in this report have therefore been aligned to this submission

Estimated final cost performance over time (£m)

Forecast completion date





Programme update

Since commissioning SMA5 in March 2022, the underlying system performance has been good, but a specific software issue required fixing. To introduce further improvements to the existing sections in service, an additional software update will be implemented in November 2022 prior to the next SMA going live. Our schedule for future signal migration areas going live has been reviewed and we now expect SMA6 and SMA7 (the eastern end of the District line) to go live in the first quarter of 2023. The final section of signalling, SMA14 (Rayners Lane to Uxbridge), is expected to go live in early 2025.

Design and installation of trackside signalling assets continues on the Uxbridge and Amersham branches of the Metropolitan line beyond Preston Road. Installation is targeted to complete in March 2023.

The heavy maintenance facility works at Neasden depot have made good progress in the long shed, with works predominantly complete including track, installation of cable routes, new power supplies, new lighting, and the installation of raised maintenance platforms.

The procurement is in progress for the planned upgrades to the heavy lifting shed and the new staff accommodation block. When complete in 2024, this facility will enable planned overhaul of Metropolitan line trains.

Line upgrades

DLR rolling stock and systems integration

Forecast completion	Gross cost to date (£m)	Gross cost to go (£m)	Gross EFC (£m)	Programme and project authority (£m)	Variance: EFC versus authority (£m)
Summer 2026	201	638	839	863	24
Change since last Investment programme report					
No change	19	(7)	12	No change	

Financial commentary

Since the last report, the EFC has increased by approximately £12m, mainly due to inflationary pressure on material costs being greater than originally anticipated. However, we are continually reviewing opportunities and mitigations to minimise the impact of this increase.

Performance over time

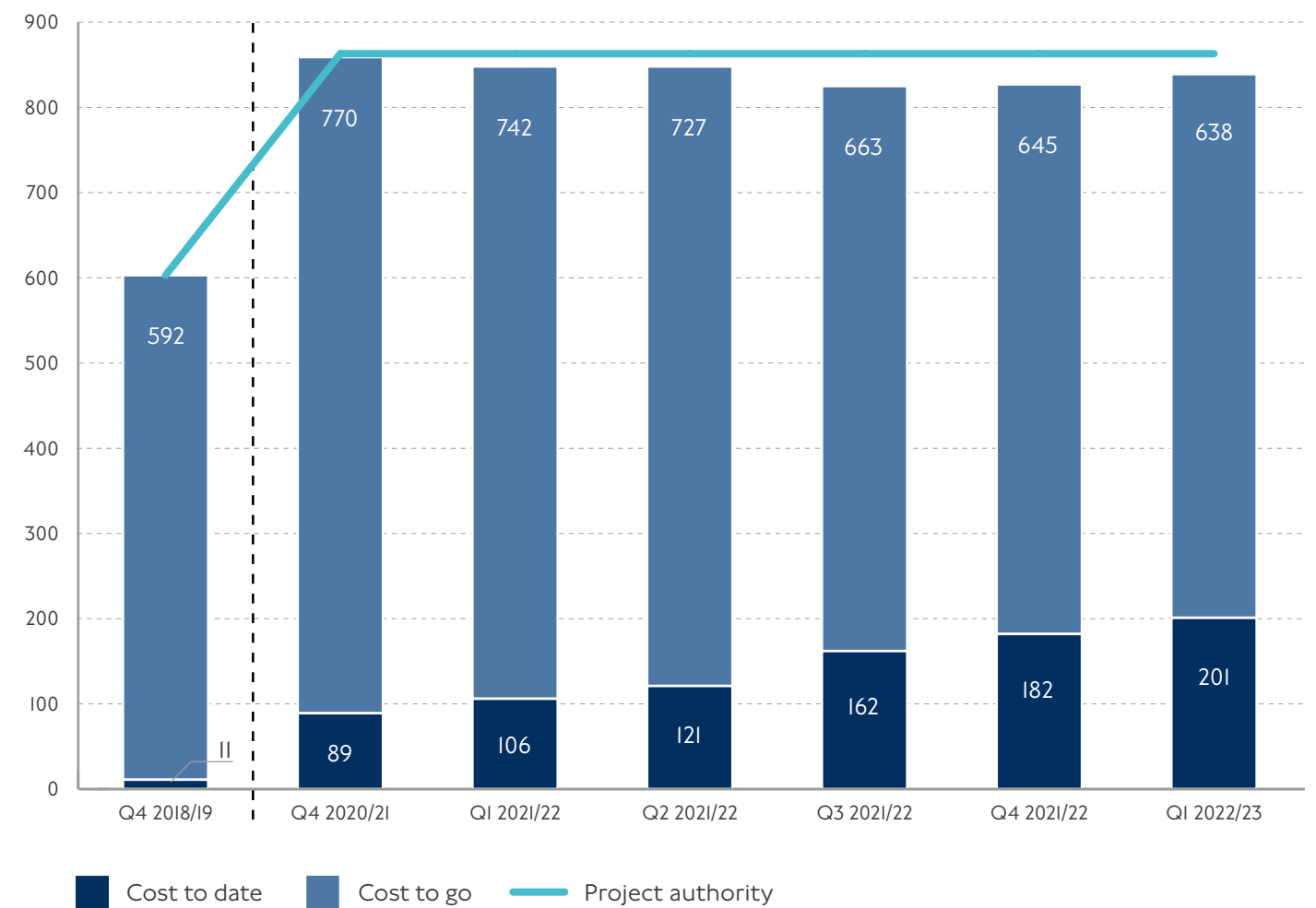
The forecast end date in the performance over time graph has not changed since the last report.

Since the original grant of Programme and Project Authority in 2019, we proposed to increase the scope subject to funding from the Department for Levelling Up Housing and Communities, taking the total number to 54 new trains.

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

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 three completed trains in the testing phase, one train awaiting delivery to the testing area and another in the final stages of manufacture, before delivery of the first two trains to Beckton in early 2023.

Beckton depot and network infrastructure

At Beckton depot, work on the northern sidings and sub-station continues. Pre-possession works are being progressed to deliver the end state northern sidings and power, which will be commissioned in late 2022.

Tenders for the maintenance facility building, temporary fit-out shed and additional southern sidings have been received, with the contract planned to be awarded by late 2022. Blackwall station secondary station access design and build contract invitations to tender were issued to prospective suppliers in July, with tender returns expected in late summer 2022.

Housing Infrastructure Funding (HIF)

Having previously completed the acquisition of land at Beckton next to the depot, the planning application for the new site south of the existing depot that will house the additional HIF trains has now been submitted. This will allow works on the land to begin later in the year.



New rolling stock for the Beckton line will arrive in 2023

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)
Winter 2027	476	2,389	2,865	2,994	129
Change since last Investment programme report					
No change	51	(11)	40	No change	

Financial commentary

Since the last report, our EFC has increased by approximately £40m, which is driven by inflation (a review of inflationary impact that overcomes other previous assumptions which reflects external market forces). These increases are partially offset by efficiencies delivered by the programme driven by active opportunities management.

Our risks and opportunities are being actively managed during each period, which may result in changes to the EFC. Our forecast completion remains the same as the last report, in early 2027.

Performance over time

The forecast end date represents the date on which the new Piccadilly line trains and all supporting infrastructure will be in use. Since authority was originally awarded in May 2018, our forecast end date has been delayed from 2026 to 2027. This was driven by a decision to defer the start of third-party spend by six months (where possible) to help mitigate funding challenges due to the pandemic. As a result of an in-depth review of the critical path activities and driving schedule efficiency, the forecast completion has been brought forward from Q1 27/28 to Q4 26/27. The new trains are now expected to begin entering service from summer 2025.

Despite the impact of the pandemic, we have reduced our overall EFC through the realisation of opportunities, an ongoing focus on value and efficiency, and reduced contract costs.

Estimated final cost performance over time (£m)

Forecast completion date





An essential substation upgrade will be made at Sudbury Hill

Programme update

Power

The high-voltage power framework was signed and first two call-off contracts awarded with our two suppliers, Balfour Beatty and UK Power Networks Services. This will enable us to start delivering crucial substation upgrades at Sudbury Hill, Northfields and Cockfosters, and complex upgrades at Cobourg Street and Manor House.

Delivery fleet introduction

We completed assembly of the first of nine cars for the first new Piccadilly line train, including applying the TfL livery. This was our first strategic milestone for the year, and was delivered early. Completion enables the car to move to the next stage of manufacture, which includes installation of internal equipment, and for the next cars to commence assembly.

Depots and stabling

We have successfully completed installation of track and signalling works for the first four roads at South Harrow sidings, as well as new driver walkways and driver access platforms. The bringing into use of stabling for four trains was achieved at South Harrow sidings on 6 July.

Cooling

We installed a new and innovative cooling panel prototype at a disused platform in Holborn station, intended to prove a cheaper and more reliable solution for cooling the Tube. This is one of the demonstrator innovation projects being delivered under the Transport Infrastructure Efficiency Strategy Living Lab programme, driving innovation and efficiency in real time.

Network extensions

Northern Line 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)
Autumn 2021	1,097	7	1,104	1,260	156
Change since last Investment programme report					
No change	(1)	(2)	(3)	No change	

Financial commentary

The EFC has remained stable and the variance on spend to date and cost to go reflects the costs that have been incurred since the last report.

Performance over time

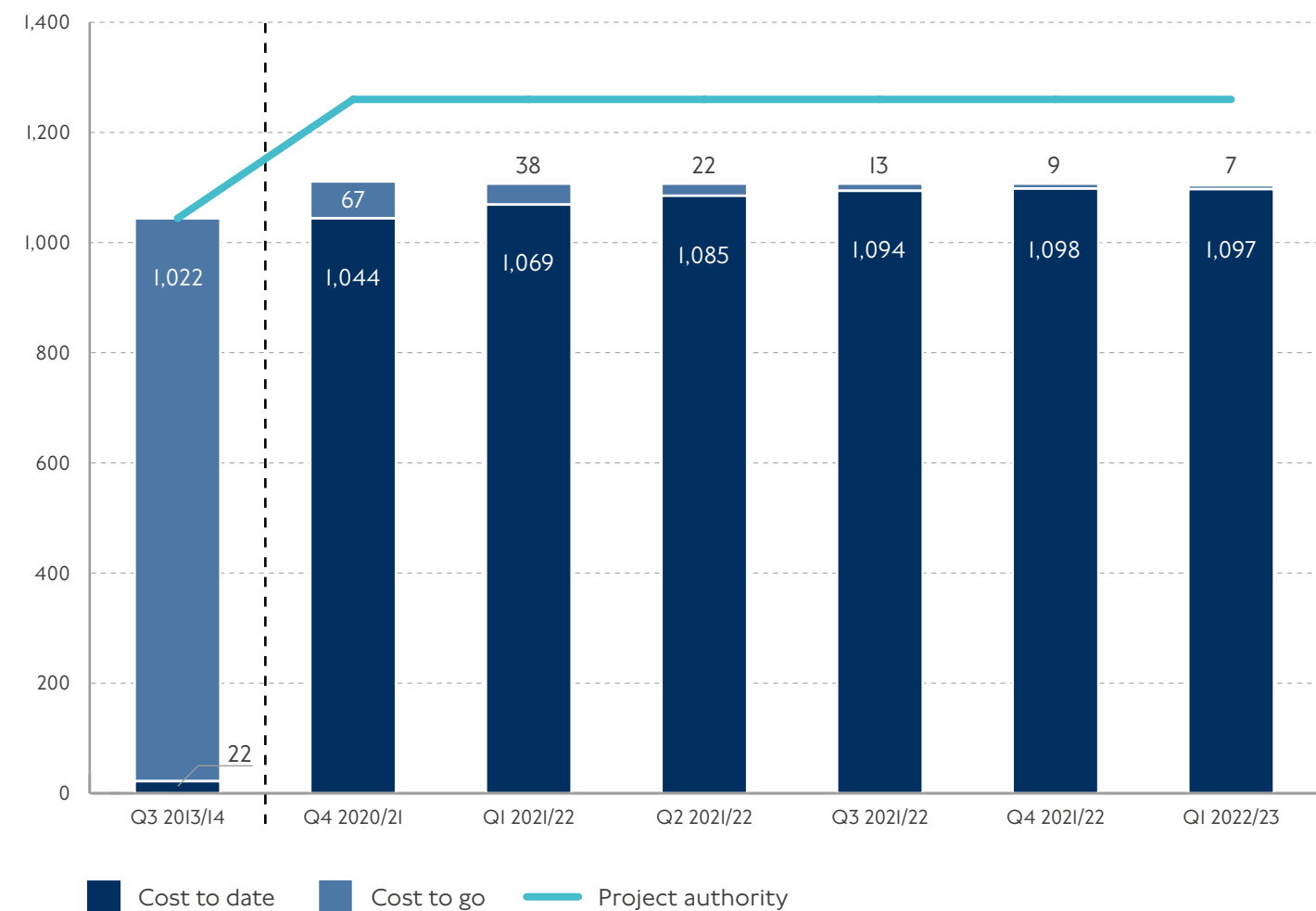
The project is expected to come in £153m under budget, bringing its EFC to £1.1bn, despite the cost pressures brought about by the pandemic.

Programme update

Contract completion was successfully awarded to Ferrovial Laing O'Rourke on 30 June 2022. This was the culmination of the review and acceptance of 25,000 articles of assurance and the close-out of 19,000 snags. Additionally, on 30 June the project achieved acceptance of the TfL Pathway Completion and Handback Certificate. There are a small number of defects remaining (16), which will be completed promptly within the defects period.

Estimated final cost performance over time (£m)

Forecast completion date



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)
Spring 2025	72	111	183	173	(10)
Change since last Investment programme report					
No change	3	-	3	No change	

Financial commentary

The EFC is currently £10m over the delegated programme and project authority of £173m. The main change in EFC since the last report is due to greater than previously forecast inflationary pressure around land purchases. The project team continues to seek opportunities, such as scope optimisation for Lower Lea Crossing and Seibert Road Noise Barrier, to bring this back in line with authority.

Performance over time

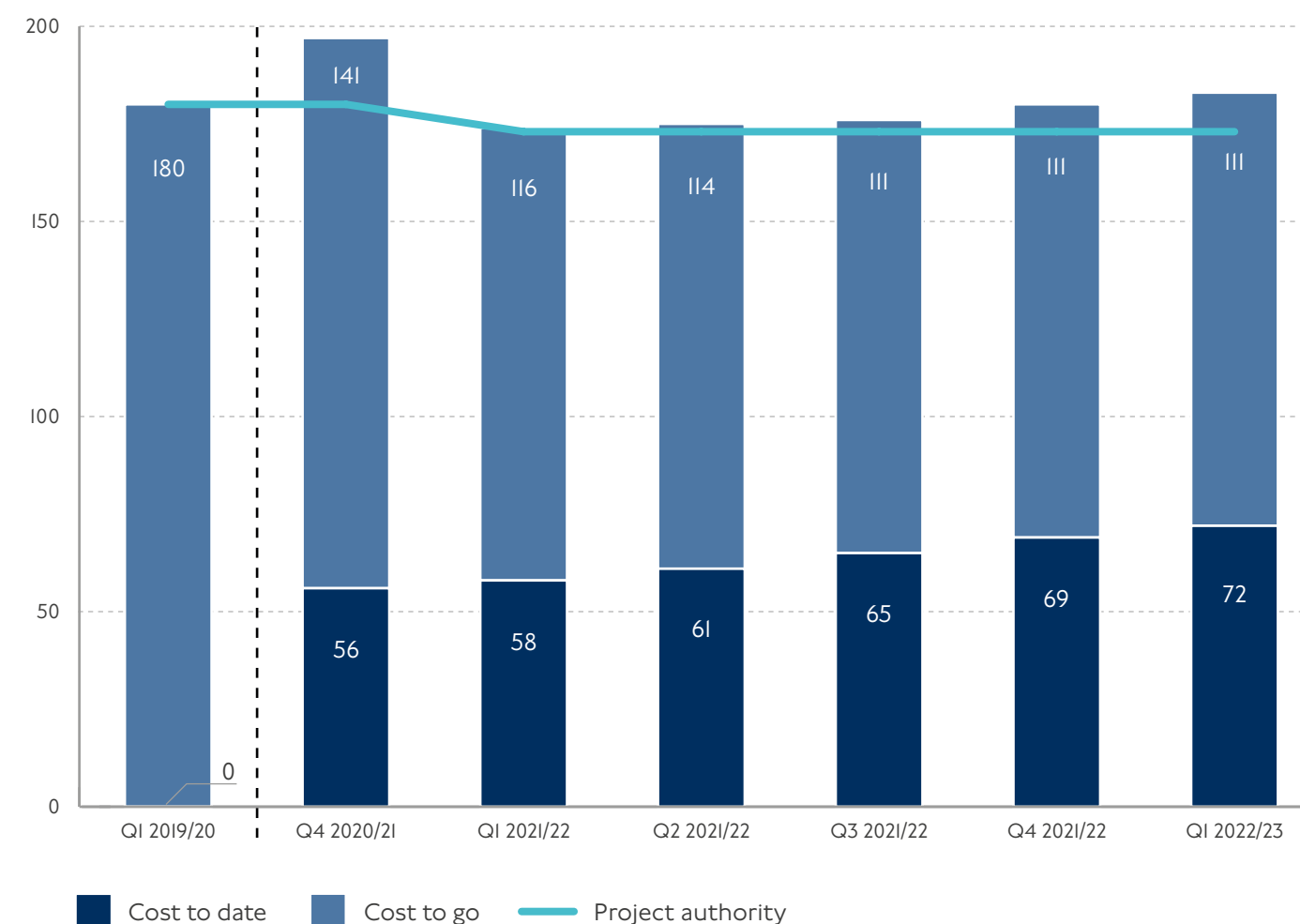
The forecast end date is when we obtain the permit from an independent assessor to use the new Silvertown Tunnel.

Our forecast end date has been relatively stable since the programme and project authority was approved in May 2019. Since the last report, however, we have seen a movement of 14 days in the permit to use date, moving from early April to mid-April 2025.

In financial year 2020/21, our EFC increased to include additional costs for implementation of the Road User Charging infrastructure. It was reduced in Quarter 1 2021/22 after this scope and budget was transferred to the Road User Charging portfolio within surface programme and project delivery, to achieve synergies with our other Road User Charging schemes.

Estimated final cost performance over time (£m)

Forecast completion date



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

Programme update

We have now taken temporary possession of much of the required land from existing tenants to enable handover of 59 out of 71 sites to our contractor, Riverlinx. Good progress continues on the issuing of notices for permanent land acquisition, with the first taking place in July.

Progress continued on the tunnel boring machine launch chamber, and the first of the tunnel boring machine components have been lowered into position ready to commence tunnelling in September 2022. Excavation works continued on the rotation chamber (where the machine will be turned) and on the retrieval chamber (where it will be extracted) following the completion of tunnelling.

Our contracts for further transport and traffic, as well as socio-economic and environmental monitoring are progressing well, with significant further modelling and analysis work now underway. This will support us in setting the initial user charges at Silvertown and Blackwall tunnels, developing the new cross-river bus services, and allow a refreshed assessment of the scheme's environmental effects in advance of opening in 2025.

The start of tunnelling, which began at the end of August, is a significant milestone and a huge step forward for this project. The tunnel boring machine will now progress under the river and, once the first tunnel is completed, it will then be turned around to head back to Newham to complete the second tunnel.



The start of tunnelling is a significant project milestone

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)
Summer 2022	325	2	327	329	2
Change since last Investment programme report					
No change	7	(6)	1	No change	

Financial commentary

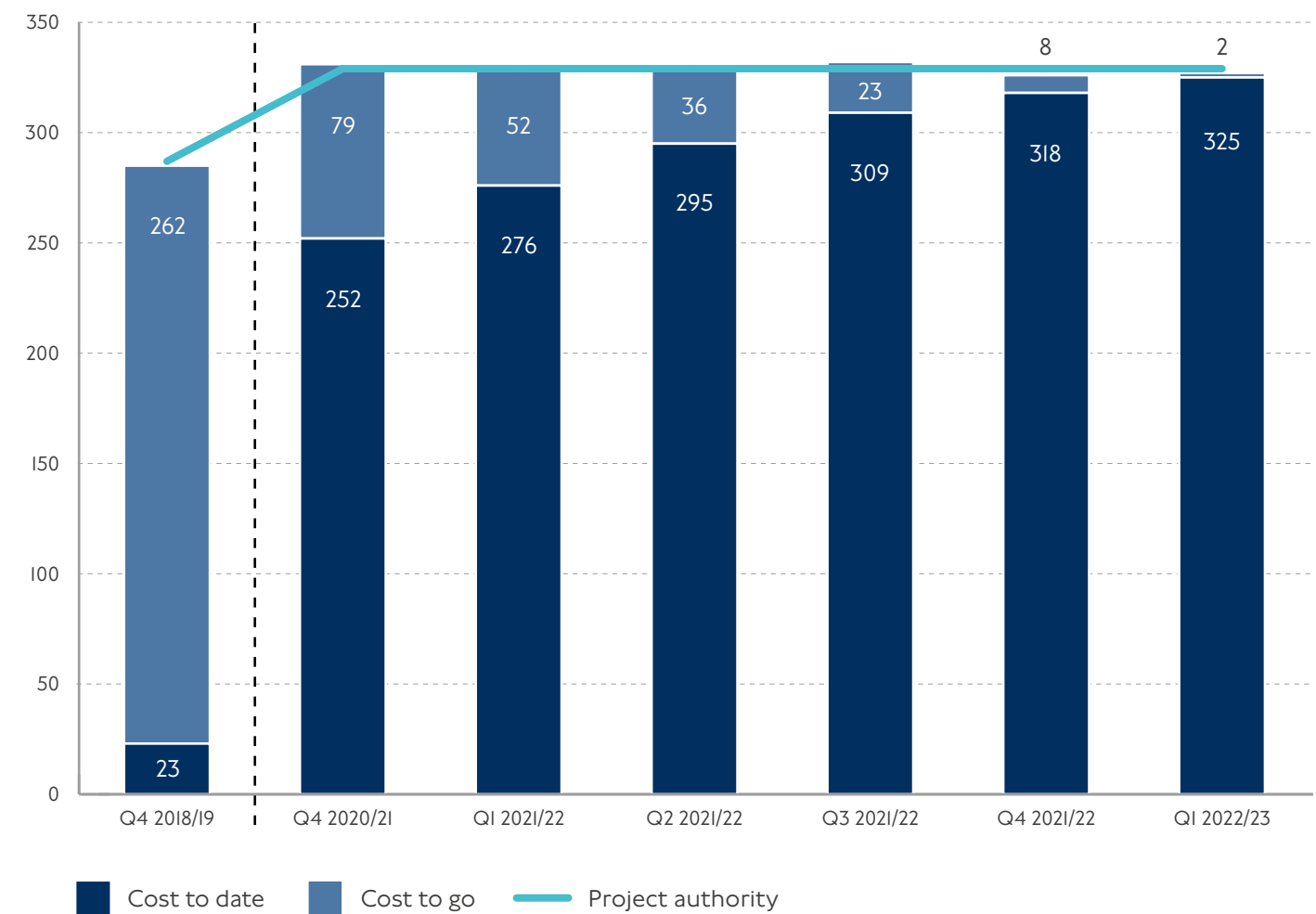
The EFC has increased by approximately £1m since the last report, due to additional work to resolve signal sighting issues and main works contract completion prolongation.

Performance over time

Our forecast end date for when services will run between Gospel Oak and Barking Riverside has been delayed since programme and project authority was approved in 2018, following the discovery of uncharted utilities and the Safe Stop because of the pandemic. The Safe Stop has resulted in rail systems works being re-planned and Network Rail possessions re-booked, with only two opportunities a year for a four-day possession. These events have also increased our EFC.

Estimated final cost performance over time (£m)

Forecast completion date





Passenger services have now been extended to Barking Riverside

Programme update

On Monday 18 July, the first passenger train ran on the new extension between Gospel Oak and Barking Riverside. We have been able to open Barking Riverside station ahead of the previously scheduled autumn completion date due to good progress in driver training, support from Network Rail, and by applying finishing touches to the station.

The extension is an intrinsic part of the Barking Riverside development, which is being delivered by Barking Riverside Limited, a joint venture between L&Q and the Mayor of London. The Barking Riverside Extension will support construction of more than 10,000 new homes alongside a range of community, commercial and retail spaces, and provide better access to employment opportunities in Barking and central London.

Throughout construction, the project supply chain has supported businesses of all sizes, with skills and job creation across the whole country. This includes steelwork from Scotland and the east of England, precast concrete from the North West and Northern Ireland, and innovative slab track from the East Midlands.

We have agreed a permanent solution of a banner repeater signal with Network Rail to resolve the signal sighting issue. A network change application has been approved by Network Rail, and all the required possessions are booked to allow us to install the foundations, erect the structure and commission the signal. All signalling works are planned to be completed within the six-month condition of the network change application.

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)
Autumn 2022	657	45	702	702	0
Change since last Investment programme report					
No change	20	(20)	No change	No change	

Financial commentary

The EFC has remained stable since the last report and spend is in line with current forecasts.

Performance over time

The forecast end date represents the opening of the new ticket hall at Bank station. 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 pandemic.

Despite these challenges, our forecast end date has remained consistent.

Programme update

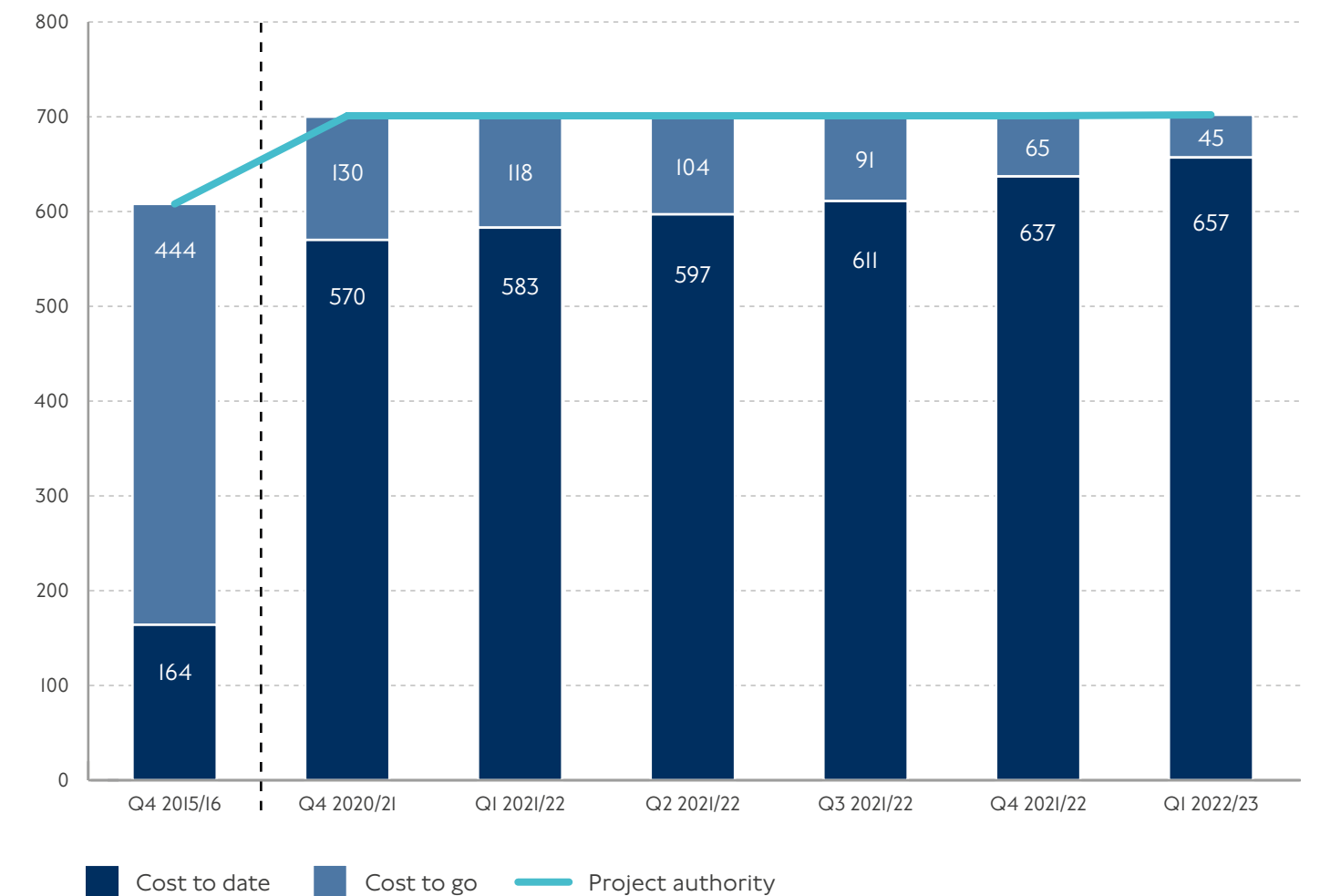
Following a 17-week planned closure, the Bank branch of the Northern line reopened on time on 16 May. During that closure, we constructed a new and wider southbound Northern line platform and spacious new customer concourse with three new passageways, which has made moving around the station quicker and easier for customers.

Bank station will see its capacity increase by 40 per cent when upgrade work finishes later this year, with more improvements still to come: step-free access to the Northern line, improved access to DLR platforms, two new moving walkways, 12 new escalators and two new lifts. There will also be more direct routes within the station and a new station entrance on Cannon Street.

Preparations have also commenced to demobilise from key worksites on the project, starting with the removal of the gantry crane on Arthur Street, which has served as the main logistics route for more than six years.

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)
Winter 2028	15	69	84	81	(3)
Change since last Investment programme report					
No change	6	(3)	3	No change	

Financial commentary

The forecast end date remains consistent, although in Q1 2022/23 the Stage I EFC increased by £3m due to revised inflation assumptions. The team vigorously interrogated the impact of the revised indices and applied an elemental approach; that is, only applying increases to those items likely to attract such uplift. For example, it was not applied to in-house resource costs but was applied to the externally procured main tunnelling contract estimates.

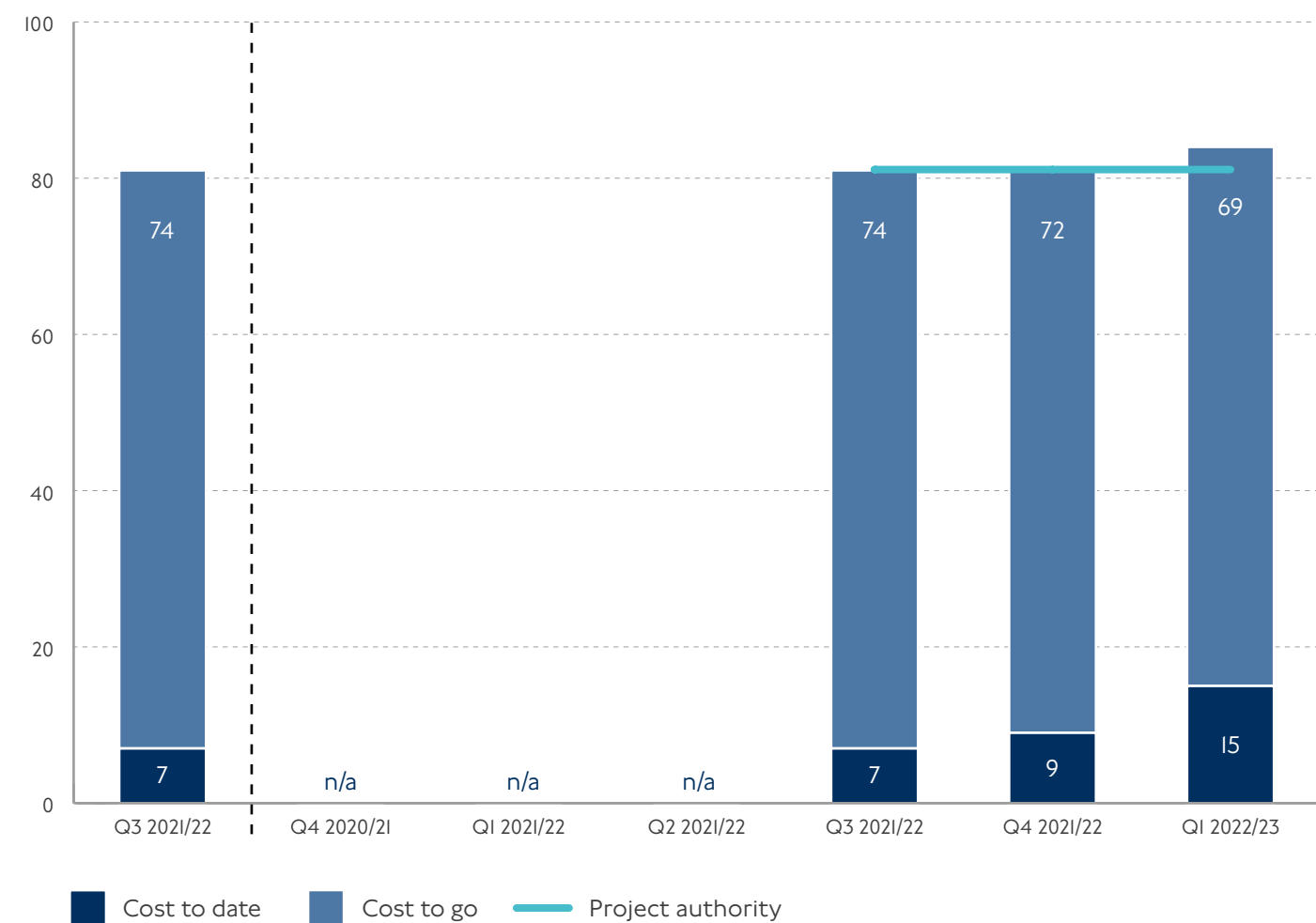
This increase in inflation has not been applied to the cost of the station box being constructed for TfL by the developer, as this is a fixed-price contract enshrined within the development agreement of December 2021. The team continues to work to develop its understanding of the project risks, and actively seeks to ensure risk provision is proactively managed and appropriate.

Performance over time

The project EFC has remained consistent through Q3 and Q4 2021/2, but is showing an uplift to Q1 2022/3 due to the impact of higher inflation. EFC will continue to be challenged, and opportunities have been reflected in the team's decision to engage the construction market much earlier than is the norm, allowing suppliers more time to identify opportunities in a competitive market.

Estimated final cost performance over time (£m)

Forecast completion date



Programme update

Since the issue of the sponsor's instruction to split the programme into Stage One and Stage Two and following the safe and successful completion of all early enabling works, the team has focussed on procurement of the further packages within Stage One. These packages have been captured in a procurement strategy and endorsed formally ahead of schedule.

The supplier responses to the Readiness and Information event (reported previously) further endorsed the approach taken within the procurement strategy, enabling our potential suppliers to start devising their win themes (and therefore most competitive prices) much earlier than is usually the case.

We are now moving ahead in our preparations to produce the requisite information to issue invitations to tender for the Stage One works. Both the ancillary works package, and the study to identify optimum minimum scope and price for Stage Two, are planned for issue to the market towards the end of 2022. Invitations to tender for the main civil tunnelling works will follow in early 2023.



The Elephant & Castle upgrade will support new homes and jobs

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)
Summer 2035	24	45	69	28	(41)
Change since last Investment programme report					
No change	1	5	6	No change	

Financial commentary

Programme and project authority is £41m lower than EFC, as it is granted on an annual basis for the following year's spend. All costs are fully reimbursable from the third-party High Speed 2 (HS2) project. EFC has increased due to additional scope instructed by HS2.

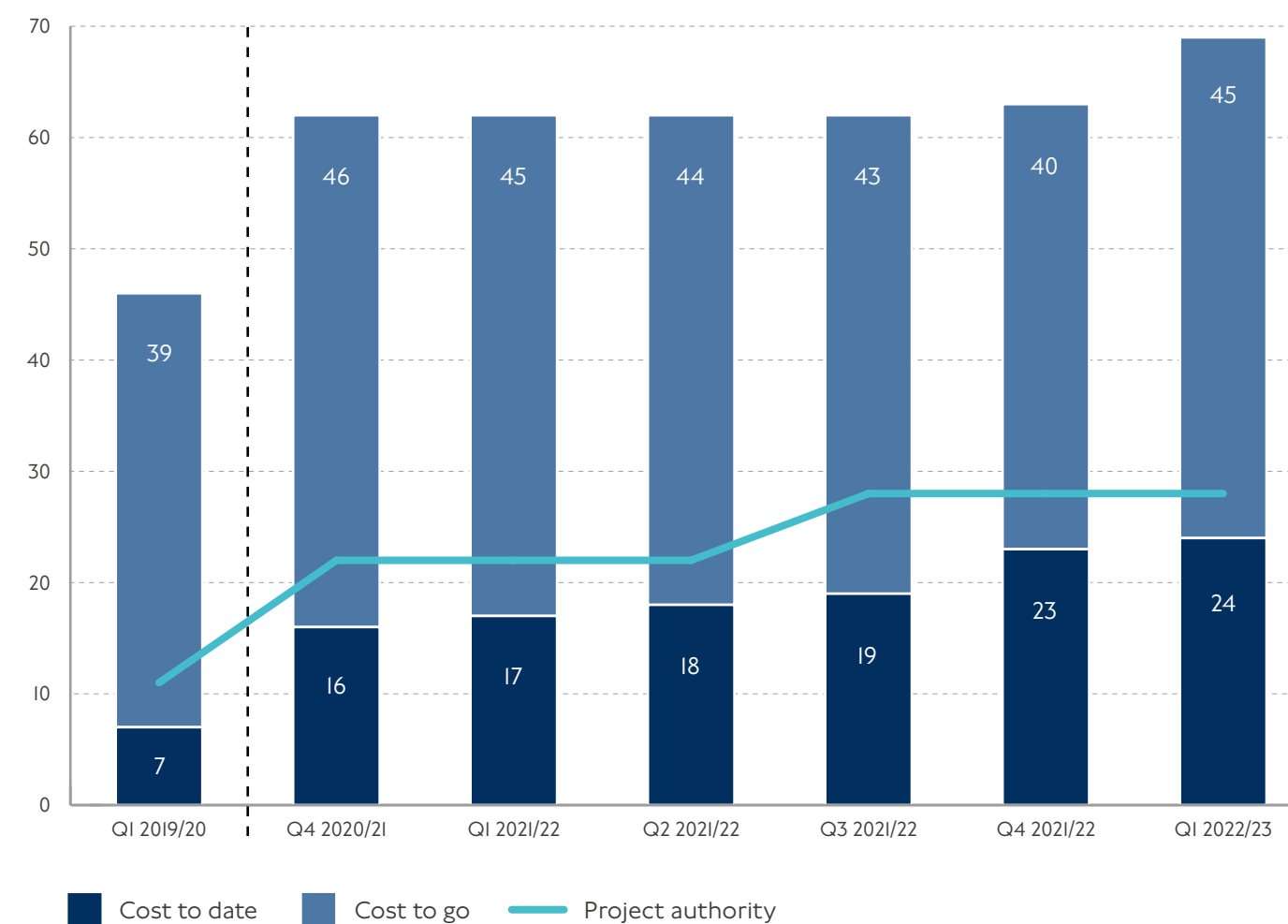
Performance over time

The reported forecast end date has been unchanged since the last report and reflects the completion of works at Euston. This programme comprises our new assets, infrastructure and operational facilities at Euston and Old Oak Common to interface with the new railway.

Since this programme was included in our Major Projects portfolio in 2019, forecast costs have increased due to increased scope instructed by HS2.

Estimated final cost performance over time (£m)

Forecast completion date



Programme update

Construction of the new Northern Line Traction substation and ventilation building by HS2 Ltd continues at Euston. The construction of the combined ventilation/cable tunnel is progressing well, with the secondary lining completed and tunnel centre wall works nearing completion.

Scheme design for the Tube station and interchange box at Euston is progressing, and we continue to attend workshops and design reviews to support the process. Detailed planning is underway for the major utility works on the Euston Road, which are expected to start early in 2023.

We continue to work closely with HS2 Ltd, the London Borough of Camden and its supply chain to manage and mitigate the impact of lane closures on the Euston Road, particularly on buses, walking and cycling.

The Department for Transport (DfT) has appointed Sir Doug Oakervee to consider the case and options for transporting excavated materials by rail, to help reduce the number of construction lorries at Euston. TfL officers met with Sir Doug on 25 May to share our views on this issue, and his report is expected to be submitted in August. Engagement with the Euston Partnership on the integrated development of the Euston Campus also continues, including the oversite development by Lendlease and the refurbishment of the existing Euston National Rail station.

At Old Oak Common, HS2 works continue at pace on the construction of the new station box that will serve HS2, the Elizabeth line and Great Western National Rail services. We also continue to work with HS2 in the design development of the new surface intermodal area, as well as working collaboratively with HS2 Ltd and its supply chain to meet its programme milestones and minimise impacts on our assets.



Our bus network covers all of London, including many famous landmarks

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	145	18	163	171	8
Change since last Investment programme report					
No change	2	(2)	No change	No change	

Financial commentary

The EFC has remained stable since the last report and spend is in line with current forecasts.

Performance over time

Our costs and authority both reduced in Quarter 4 2021/22 driven by the decision by the business to defer the enhanced signalling for the Jubilee line and fleet improvements, and to descope from this programme due to funding challenges in the wake of the pandemic.

Programme update

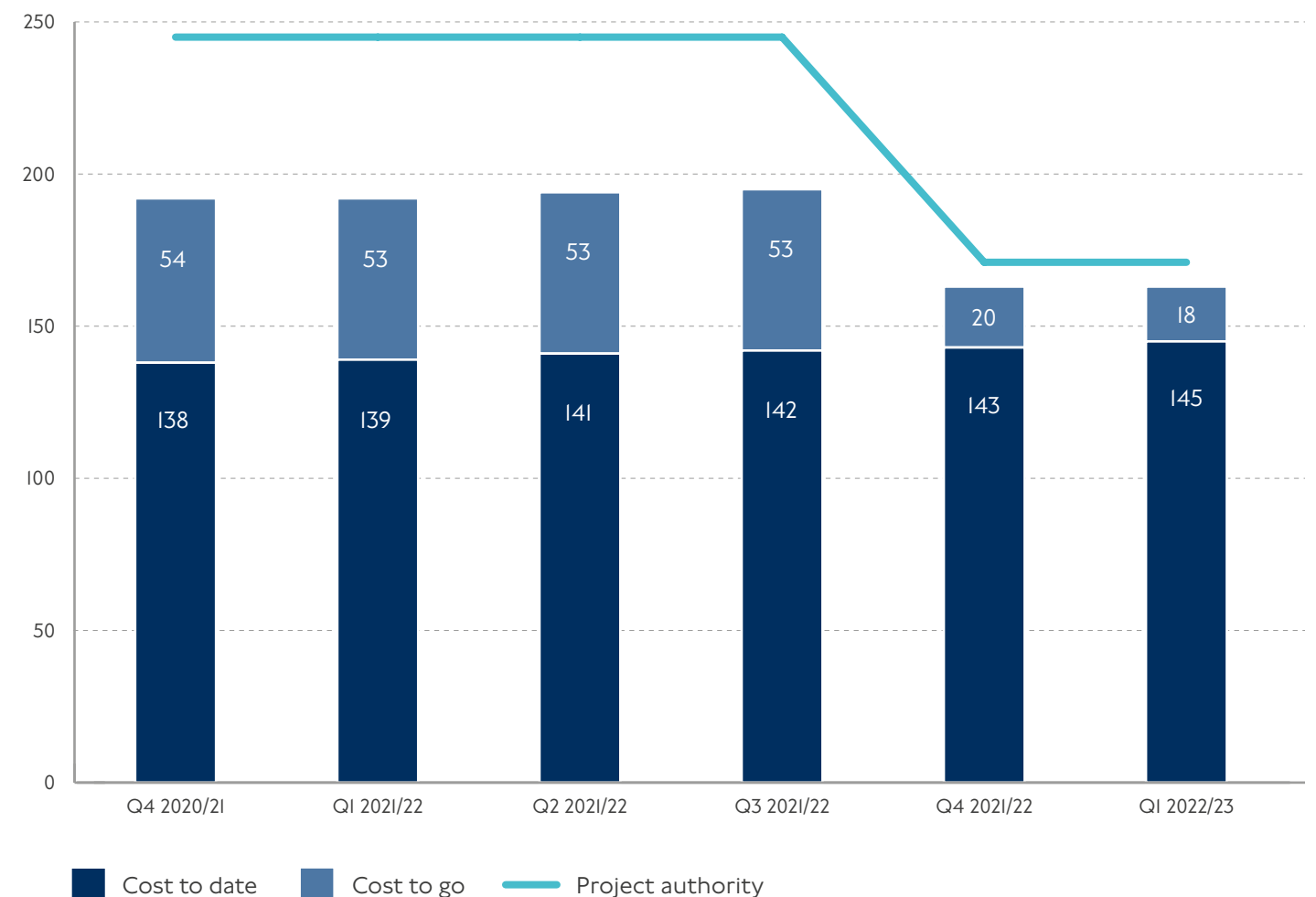
Delivery of the final scheduled Northern line signalling software updates continues, with the first release targeted for commissioning on the railway in late 2022 and the last in mid-2023. These software updates address residual issues and requirements following completion of the Northern Line Extension and the Bank station closure works.

The enhancement work for the Northern line power supply is coming to a close and is due to be completed in the third quarter 2022. This will provide 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 autumn 2022. These will support Metropolitan line service uplifts.

Following approval at the Programmes and Investment Committee, the Jubilee line enhanced signalling and fleet improvements, which will enable a peak service of 32 trains per hour, have been deferred by the business and descope from this programme. Delivery of further targeted signalling software updates on the Jubilee line are currently underway, with the first benefits due to be delivered onto the line in the fourth quarter of 2022.

Estimated final cost performance over time (£m)



London Underground

Our programmes ensure the safety and reliability of the existing network, including work on train systems, infrastructure and technology. We use both internal and third-party investment to deliver accessibility enhancements and station capacity improvements



Enhancements

Stations and depots

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	430	70	499	652	153
Change since last Investment programme report					
I+ 5 years rebaselined	14	(53)	(39)	No change	

Financial commentary

The enhancements programme is reporting the full costs of projects over their whole life.

The additional programme and project authority is due to the pause and stop decisions on uncommitted projects pending a future funding agreement.

This will be monitored throughout the year and directed to restart previously paused projects if funding is secured or released if not. The programme is due to report progress to the Programmes & Investment Committee in October 2022.

Performance over time

The enhancements programme has delivered to plan in the first quarter of the year, delivering £13m (gross) of scoped work, and we have confidence in meeting the full year deliverables to budget.

Programme update

The enhancements programme covers a range of improvement projects, mainly to stations and depots. We improve stations primarily through enhancing accessibility, relieving congestion and carrying out large-scale capacity upgrades. The current funding situation has led to a number of projects, including step-free access, being paused.

The programme has had a successful quarter delivering two strategic milestones: completing works at Borough during the Northern line blockade earlier in the year, and completing demolition of the temporary ticket hall at Whitechapel following the opening of the new entrance that serves London Underground (LU), Overground and the Elizabeth line.

The GLA is submitting a bid to the central Government Levelling Up Fund in relation to works at Colindale and Leyton. A successful bid would allow these projects to develop and complete.

Tottenham Hale

Following the completion of redevelopment works at Tottenham Hale in December 2021, the project has completed the reinstatement of the work site and is progressing minor snagging works, forecast to conclude in summer 2022.

Paddington

Fit-out works continue across the new ticket hall areas, in conjunction with the third-party developer, to prepare for the start of lift installation. The back of house area fit-out is also progressing. The project is on target for opening of the enhanced and step-free entrance in early 2023.

Colindale

The detailed design and early contractor involvement phase for an enlarged ticket hall at Colindale, with increased gateline capacity and step-free access, has been completed. This has provided greater confidence in costs, schedule, and construction readiness ahead of a future decision on financial and contractual commitment to progress into construction delivery. The project is paused pending availability of funding.

King's Cross St Pancras

Negotiations continue and hope to conclude later this year on a developer-funded scheme to upgrade the entrances on the south side of Euston Road, as part of a wider redevelopment of the area. The delivery timescales for the project are still to be confirmed.

Knightsbridge

The new Brompton Road entrance is on schedule to open later this summer, with the final fit-out works to back of house and new customer passageways underway. The lift contractor has begun the installation of lifts one and two in the new Hooper's Court entrance, which is still under construction. The project remains on target to open this new entrance and provide step-free access at the station in summer 2023.

Leyton

We continue to work closely with our key stakeholder, the London Borough of Waltham Forest, to develop a new ticket hall, with the aim of increasing capacity and providing step-free access. The GLA have committed £0.5m funding for this scheme, which will enable the completion of the concept design and value engineering exercise. Following this, further work on this project will be paused unless additional funding is forthcoming.

London Bridge

We are working with a third-party developer, who is proposing 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 next phase of the design will begin once the developer has secured planning consent. The timing of this is uncertain because the date of the expected planning inquiry has yet to be confirmed.

Notting Hill Gate

The new owner of Newcombe House has formally confirmed that they are progressing an alternative scheme that will have no impact on the station and therefore will not be providing step-free access. The project will consequently be closed.

South Kensington

In 2021, the Royal Borough of Kensington and Chelsea rejected our planning application to restore and enhance South Kensington station and its surrounding streets, and to provide step-free access to the Circle and District line platforms. Following a thorough review, we have, with our joint venture partner Native Land, submitted an appeal, which will be considered in autumn 2022.

West Ham

We are working with the developer Berkeley Homes on a new ticket hall to serve the Twelve Trees Park housing development at West Ham. The main construction works associated with the new entrance are progressing well, with the construction of the main abutment walls, which will support the bridge deck over the Jubilee line, now complete. The new footbridge just to the north of the station was lifted into place on 19 June 2022.

Waterloo

As part of a wider redevelopment at Waterloo that will see Elizabeth House demolished, we are developing a project to provide step-free access to the Northern line platforms. Discussions with the developer are ongoing and the programme is yet to be confirmed. The lift shaft would be constructed by the developer; however, the fit-out of the shaft would be subject to affordability and availability of funding in the future.

Stratford

A new south-western entrance is planned to open at Stratford regional station in early 2024. It is a collaborative venture between the London Legacy Development Corporation, London Borough of Newham and the GLA, who are fully funding the capital works. Preparation, including gaining endorsement for the start of detailed design, is now complete. The design and construction readiness phases of the project will continue until the end of 2022 in preparation for start of the construction phase soon after.

Acton train modification unit

The new state-of-the-art facility at Acton that enables the heavy overhaul and modernisation of trains as part of the Central Line Improvement Programme (CLIP) has been in operation since summer 2021 and is now fully supporting the CLIP production. The project has now completed and closed. This valued asset to our estate will support future fleet renewal programmes for many years to come.



Works progress well on a new ticket hall at West Ham station



Waste heat produced by the Tube will be reused via vent shafts

Acton warehouse

Works at the Acton warehouse are progressing well, with essential clearance works completed. It has been a complex and challenging operation to safely remove the existing warehouse contents, and then make the building safe to enable essential surveys to progress ahead of full demolition. Hazardous materials, such as asbestos, are in the process of being safely removed and disposed of.

Further detailed survey works associated with existing services and utilities will inform and facilitate extensive relocation and diversions, as part of the next phase of site decontamination and clearance.

Coordination is progressing well to ensure the project meets the strategy for the future use of the Acton depot, and the relocation of business activity from Lillie Bridge depot and Ruislip redevelopments.

Substation ventilation

A total of 16 substations have now been upgraded, with a further four at Earl's Court, Shepherd's Bush, Victoria and Notting Hill Gate currently progressing. Development of the final two sites continues, with the contract awarded for Bouverie Place on 30 June and Barons Court expected in autumn 2022.

Waste heat and private wire

Both the waste heat and solar private wire projects were paused at the end of the financial year due to continuing uncertainty over our funding position. During Q1, however, additional funding has been made available from Safety, Health and Environment priorities to progress with the development phase of both projects. The projects are in the process of re-mobilising and will continue the development phase throughout the remainder of the financial year, pending further business case reviews and investment decisions.

The successful delivery of the waste heat project will see the reuse of heat from vent shafts. The Tube produces 500 gigawatt hours of waste heat per year, of which 10 per cent is available for reuse. Six ventilation shafts are under consideration, with a view to serving thousands of residential and commercial premises and public buildings such as schools. The aim is to reduce the need for gas combustion and improve air quality by decreasing carbon emissions.

The solar private wire project focuses on direct connection to new-build solar photovoltaic generation. Based on a typical solar generation profile, the opportunity represents up to 64 megawatts of renewable generation, equivalent to five per cent of our annual energy load. Over a 15 to 25-year contract, by purchasing the energy and importing it onto the network, approximately 62,000 tonnes of carbon saving could be achieved.



More than a third of Underground stations are now step-free

Enhancements

Step-free access

Since 2018, we have introduced step-free access at Newbury Park, Buckhurst Hill, South Woodford, Mill Hill East, Cockfosters, Amersham, Debden, Ickenham, Wimbledon Park, Osterley, Sudbury Hill and, most recently, Harrow-on-the-Hill, which became the 91st step-free station. The lifts at Harrow-on-the-Hill were opened by the Mayor on 8 March. It was the 12th and final station to be delivered by the accessibility programme and means that 33.5 per cent of Tube stations are now step-free.

Without a long-term funding deal from Government, it is not possible for us to progress any further schemes under the step-free access programme. Only contractually committed and third-party schemes are still being taken forward currently.

From 2 November 2021 to 10 February 2022, we held an online public consultation about our future step-free access priorities and improvements. We are reviewing the results and plan to publish them later this year. In light of the results, we will then begin a process of considering the priority of different step-free work. Delivery of any of this work would be subject to funding becoming available.

Infrastructure renewals

Built environment and civils

Forecast completion	Cost to date (£m)	Cost to go (£m)	EFC (£m)	Programme and project authority (£m)	Variance: EFC versus authority (£m)
2022/23 to 2027/28	13	615	628	1,192	564
Change since last Investment programme report					
5 years +1 rebaselined	No change	No change	No change	No change	

Financial commentary

The programme has been realigned to a six-year view consisting of the current year 2022/23 plus a future five-year control period, commencing 2023/24.

All the reported numbers, including forecast and programme and project authority, refer to this period only. The basis of the forecast is the managed decline scenario with a capped level of renewals. This is dependent on business planning and prioritisation following the outcome of our funding discussions with Government and will be updated in later reports. However, the managed decline scenario will result in deferrals and reductions in scope to align to our available funding.

The remaining programme and project authority will be requested in future authority papers as the later years of scope develop. The authority was approved by Programmes and Investment Committee in July 2022.

Performance over time

The programme is £3.5m below budget due to the re-phasing of some work to later periods. This has been done to align built environment work on Rickmansworth cutting with an existing possession to reduce cost and disruption on site. The programme is expected to recover this shortfall across the year and has a strong delivery pipeline.

Programme update

The infrastructure programme delivers critical renewals to the assets that support the train system. The programme includes renewals work on built environment, civils and structures as well as all systems assets (mechanical, fire, communications, power and electrical). The work bank is prioritised to address asset condition concerns to maintain safety and reliability of the railway.

Key successes across the programme include the completion of complex escalator works at South Kensington, commissioning of 75 per cent of the backup power units and early milestone achievement for asset data surveys across 91 station sites.

Built environment and civils

We have 30,000 building and civil assets across the network, providing structural support, stability, and protection to the railway. The asset base includes more than 16,000 bridges and structures and 235km of embankments and cuttings, as well as tunnels, lighting masks and flood protection assets. We are assessing their condition to improve our understanding of our asset base, which will help us to plan future interventions.

Water ingress

Concept design at Liverpool Street and Charing Cross to address water ingress is progressing, and intrusive site surveys have begun. Feasibility surveys to develop options for water ingress remedial works completed at St Paul's and Chancery Lane.

Station safety and ambience

We completed the lighting renewal works at West Acton, improving ambience and LED lighting levels in the ticket hall. Platform re-surfacing works were also completed at Leytonstone, reducing the risk of slips, trips and falls to the public and staff.

Cuttings and embankments

Works to remediate an embankment between Rickmansworth and Chorleywood finished on site in March. The main works to remediate the cutting between Park Royal and Alperton (Piccadilly line) were completed during a possession in early July. Works continue to progress on-site to stabilise the cutting between Grange Hill and Chigwell on the Central line to ensure the continued safe running of the railway. The programme continues to progress feasibility work for future interventions to embankments and cuttings at priority locations.

Rail Vehicle Accessibility Regulations

A temporary platform hump is in place at Paddington Bakerloo line station and is in the process of being converted to permanent. Installation of manual boarding ramps is complete at all planned stations apart from Queen's Park, which is scheduled to be completed in Q2.

Welfare facility renewals

We are carrying out targeted renewals of staff welfare facilities at prioritised locations. The renewals will improve the condition of the facilities and the environment. We have awarded the main works contract, and LED lighting and deep clean works have completed on-site in the first group of locations. Physical works will start in the next quarter.

Building systems

Our building systems 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.

King's Cross St Pancras communications

We are progressing works to replace a range of obsolete communications equipment at King's Cross St Pancras, including station management systems, video, audio, and alarm systems.

Jubilee line communication systems

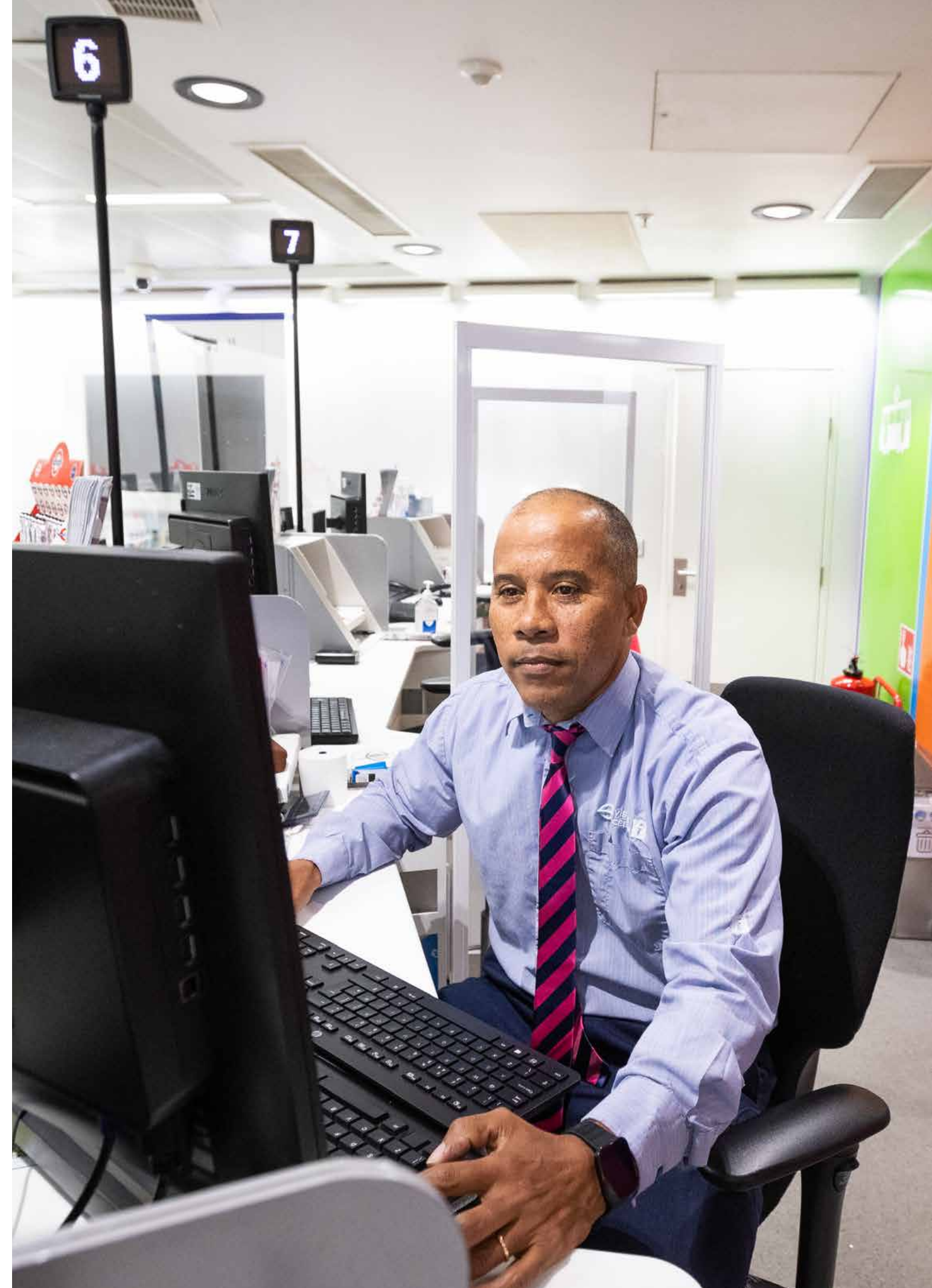
We have completed concept and detailed designs to replace station information management systems, public address and voice alarm systems, as well as the passenger Help Point systems, at eight stations on the extension section of the Jubilee line. Two stations have started on site (London Bridge and North Greenwich).

Jubilee line ventilation systems

Work continues to upgrade the obsolete tunnel ventilation control panels and to refurbish the fans of the staircase pressurisation system at all Jubilee line extension stations and intermediate shafts. We are also upgrading the obsolete hardware and software for the tunnel ventilation central control system located at Neasden Service Control Centre and Stratford Market depot. This will ensure that the tunnel ventilation system can continue to be used for cooling during normal operation and smoke extraction during emergencies.

Smoke and heat ventilation

We are replacing and refurbishing 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 will provide both fire strategy compliance and manage warm weather temperature control.



Targeted renewals will improve staff facilities and environment

Infrastructure renewals

Lifts and escalators

With the opening of the Elizabeth line and other major station projects, there are now 524 escalators, 311 lifts and four passenger conveyors on the London Underground network, which are essential to ensuring customers have safe, reliable and quick access to our services. This programme provides the rolling asset renewals work to keep these assets in operation.

Maintaining and improving lift and escalator availability requires ongoing refurbishment and renewal. Typically, escalators need replacing every 40 years and lifts every 20 to 40 years, depending on the type. This means we need to replace around 2.5 per cent of our escalator assets and four per cent of our lift assets each year to maintain them at the current level of good repair.

South Kensington

We completed works to replace the five life-expired escalators at the end of May, and Piccadilly line services started serving the station again on 1 June. As part of the work, we repainted and replaced tiling in the stairways and ticket hall, as well as restoring the heritage paving slabs in the arcade.

Marylebone

We have begun installation of one of the two original life-expired existing escalators. All works are due to complete in 2023.

Oxford Circus

Refurbishment to improve the condition and reliability of the escalators at Oxford Circus began in May 2021 and the sixth and final escalator was completed in July as planned.

Jubilee line

The rolling escalator refurbishment project has delivered two refurbishments in the financial year as planned. Works have begun on the next three refurbishments planned for 2022/23.

Borough

Fire hydrant works were completed and lift installation works were completed by 22 August as planned.

Power and electrical

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 the assets and the expected age, we deliver a rolling programme of renewals to maintain the integrity of power delivery to the railway.

Uninterruptable power supply

Work is nearing completion, with 16 of 22 life-expired units replaced and commissioned to ensure a continuous power supply to critical signalling assets on the railway. Six further units have been delivered for planned installation in the summer. Another four units have been commissioned over the summer, with the two remaining at depots to be installed pending possession availability.

Offline battery power inverters

The procurement of 20 emergency lighting battery systems was paused due to market responses and reassessment of the strategy. We have developed plans to resume procurement, to obtain a better value and quicker replacement programme of prioritised units.

Traction power

Detailed design work has been completed for the replacement of 11 traction isolation switches at Ruislip depot to address equipment non-compliances and remove operational restrictions. Works started on-site in June as planned, for completion by end of 2022/23.

A replacement high-voltage switchboard has been installed at Greenford substation and has undergone successful site acceptance testing ahead of commissioning due in Q2. A contract was awarded in May 2022 for the replacement of the DC traction switchboard at Holborn. These works will address existing operational restrictions and safety risks at this key Central line site.

Power control

We have completed the site acceptance testing of the replacement network-wide power control system. This comprises control centres linking to circuit breakers across the network, which enable train traction control. Operator and maintainer training is in progress with migration to the new system due in Q3 following user confidence testing. The second of the control system upgrades on the electricity generators at Greenwich Power Station is nearing completion after some delays due to age-related equipment faults.

LED lighting

We have continued the conversion of traditional fluorescent lights to low energy LED lighting, improving efficiency and reducing ongoing maintenance costs. The total number of conversions now sits at around 10 per cent of stations, including those carried out under this programme. We completed 26 stations and high-priority areas within three depots in 2021/22. Progression of these works has been temporarily paused due to the current funding constraints.

Train systems renewals

Track

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	54	1,714	1,768	1,791	23
Change since last Investment programme report					
5 years +1 rebaselined	No change	No change	No change	No change	

Financial commentary

The programme has been realigned to a six-year view consisting of the current year 2022/23 plus a future five-year control period, commencing 2023/24.

All the reported numbers, including forecast and programme and project authority, refer to this period only. The basis of the forecast is the managed decline scenario with a capped number of renewals. This depends upon business planning and prioritisation of spend following the outcome of our funding discussions with Government and will be updated in later reports. However, it is likely that the managed decline scenario will result in deferrals and reductions in scope to meet our available funding envelope.

The remaining programme and project authority will be requested in future authority papers as the later years of scope develop. The next authority paper is due in October 2022.

Performance over time

The programme has delivered strong performance in the first quarter of the year with an additional £2m of work over the planned level completed. This is in line with the strategy to initiate more work in the early periods of the year and actively manage the workbank in later periods when there is more certainty of the funding position.

Programme update

The train systems programme delivers critical renewals across multiple asset groups that function as an integrated train system. The programme includes work on track, passenger and engineering fleet, and signalling.

There have been a number of notable successes over the quarter, including a very successful Easter possession for track works, dynamic testing of the Central line renewals prototype train and use of our new engineering vehicle cranes on live project work. Significant progress has been made on supplier engagement for signalling works and continued overhauls on multiple fleet stocks.

Our track assets are an essential component of a safe and reliable railway. Track is continually degrading and needs rolling maintenance and renewals to maintain it. Each section of track may have a residual life of 40 to 60 years, meaning we must renew two to three per cent of our track every year, as well as making ongoing component replacements.

Where possible, we also aim to progressively install high-integrity, low-maintenance, flat-bottomed rail on concrete sleepers, replacing bullhead rail on timber sleepers, some of which has been in service since the early 1900s. This modern track is more stable and reliable.

Between April and June, we installed 142 metres of new ballasted track on the Piccadilly line. We also completed like-for-like bullhead renewal of points and crossings at Parsons Green on the District line.

Other track renewals continued during Q1, with 456 metres of new concreted track completed in the deep Tube areas, as well as replacing 1,135 metres of bullhead rail with the more modern flat-bottom form.

Over the Easter weekend, on the open sections of the sub-surface railway, we renewed 395 metres of channel drainage, installed two new drainage catchpits and removed three existing catchpits on the Piccadilly line between Boston Manor and Osterley.

Train systems renewals

Passenger fleet

Programme update

We have more than 600 tube trains operating across 11 lines, with the oldest trains having entered service in the 1970s. To better predict interventions, we have developed a 25-year 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.

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.

Victoria line (overhaul)

We continued to upgrade the pressurised ventilation fan systems, completing work on the 21st train, which will reduce maintenance. Delivery of the coupler' overhauls continued, with 14 now completed. The doors' overhaul started on 26 June.

Metropolitan line (overhaul)

The 11th Metropolitan line train completed its bogie overhaul, which ended the ramp-up period and moved the projects into the regular beat rate of overhauls.

Jubilee line (overhaul and component renewal)

The first phase of the overhaul programme continued to plan. Mobilisation for the bogie overhaul continues at Stratford Market depot, with further procurement, recruitment and development of sub-suppliers' plans. The project supported the mitigations needed to keep the trains in operation until heavy overhaul takes place.

As part of the Jubilee line renewals (reliability) project, we have completed the feasibility on a permanent fix to reduce the risk of fatigue cracking in the carriage underframe and drawgear modifications. The project has been preparing for the invitation to tender for this solution.

Piccadilly line (overhaul)

On the Piccadilly line life-extension works 89 per cent of the floor scope is now complete. Wheel and motor overhauls have continued to plan. We have completed 36 per cent of the second lift cycle to take the fleet to end of design life.

Central line (renewals)

The large-scale renewals programme (known as CLIP) continues to progress. The prototype train has completed installation and dynamic testing for all electrical systems, which include the passenger information system, CCTV, LED lighting, data transmission system and saloon design. This prototype train has successfully undertaken dynamic testing on all Central line stations, which has identified minor integration issues that the team are now working with our suppliers to fix through software updates.

After completing extensive off-site eight-car high-speed testing in Old Dalby, we continue to conduct multiple full London Underground mainline dynamic tests (all stations), for the traction prototype train. Maintenance demonstrations have started to introduce the new systems to staff and to seek their feedback. At the same time, we have procured all materials and are in the final stages of installation on a further train.

Bakerloo line (LED lighting)

The first Bakerloo line train with new LED lighting was returned into service in Q1. We have successfully completed ten four-car units, and five three-car units and put them into service with no issues. Residual works designs have been progressing well and staff welfare facilities are also procured to enable full production during the summer.

Bakerloo, Central and Waterloo & City lines (accessibility)

On the Bakerloo and Central line fleets we have a programme of works critical to improving accessibility. We modified the first Bakerloo line train by fitting in wheelchair bays, grab poles and flooring. Passenger information prototype system testing is progressing, as well as preparing materials at Stonebridge Park depot for next train installation. We finished installing priority bays and grab-poles on all Waterloo & City line trains on budget and ahead of target.

Adhesion train (overhaul)

Preparations have continued for our rail adhesion units for the Central line. These apply sandite to manage adhesion levels when leaves fall on the tracks. The first train has had this year's work completed at Acton and the second train's overhaul continues to plan.

Engineering vehicles (renewals)

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 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 encourage enhanced productivity and an improved safety culture.

We have secured final approvals for a vehicle that will change the way we replace track by mechanising concrete track renewal in the deep Tube. Made up of three wagons, a prototype vehicle has been fitted with track renewal equipment, handrails and steps. This will significantly reduce manual handling tasks on site and improve staff safety.

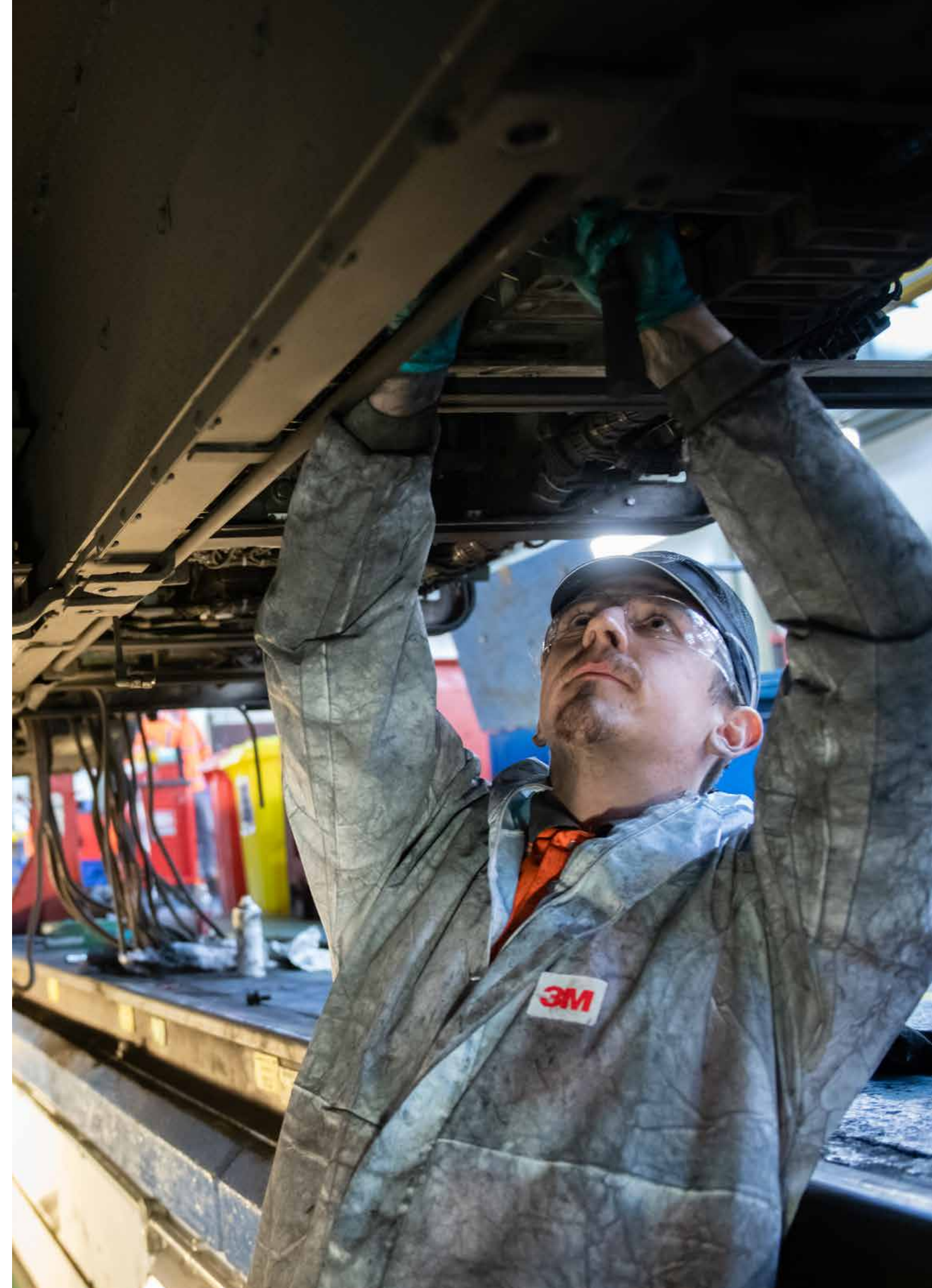
We are purchasing a new fleet of engineering wagons from the world's largest rolling stock manufacturer. The five wagons so far delivered to the UK have completed static testing with dynamic testing now underway. The wagons have successfully passed bogies frame testing and the manufacturer is preparing paperwork to support component production. Ruislip depot has also expanded sufficient stabling roads and track improvements to accommodate the new wagons in future.

We purchased two rail-mounted cranes and eight tilting wagons from Kirow in Germany for modular points and crossings renewals. After successfully operating within the Ruislip depot to support local track renewals works, and having undergone a tough assurance process, the cranes have received plant approval in London Underground open sections. The team is now working towards sub-surface and tunnel environment approvals.

The remote track-monitoring project (to replace the existing life-expired track recording vehicle) was awarded the contract for the design and build of two sets of new track geometry recording equipment and mobilisation is underway.

A new project (deep Tube tamper) has been initiated, with work underway to develop requirements and business case for critical track maintenance. This tamper will replace the existing London Underground single deep Tube tamper, which is in poor asset condition and approaching end of usable life.

The engineering vehicles' overhaul programme is making slow progress with the remaining 24 wagons due to supplier issues. Mitigations are being developed to bring back the wagons to Ruislip depot and resolve the snagging problems in-house Works on the second crane are near complete, and the team conducted a market analysis on other tamper overhauls with outcomes to go into procurement strategy in the next quarter.



Maintenance work underway on Bakerloo line train



Upgrades to signalling and control ensure safety is paramount

Train systems renewals

Signalling

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 is paramount and that the overall cost is spread across a closely monitored timeline.

Signalling renewals

Progress continues on the Central line life-extension projects, with design work continuing for the obsolete systems. This is critical to ensure that the systems continue to operate until the incremental signalling upgrade takes place on the Central line.

Northumberland Park depot re-signalling project has completed the operations and maintenance concepts, and requirement specifications are being refined with subject matter experts. This will inform the project direction over the next 12 months. The two obsolescence projects, the midlife overhaul of the platform edge doors on the Jubilee line and re-wiring the interlocking machine room at Acton Town, are now working through the feasibility and design stages.

Incremental signalling upgrade

The procurement strategy has been approved for the Bakerloo line control room fit-out works and the control system changes. In addition, we will be improving the Metropolitan line control room blast blinds. Contracts have also been awarded for the early stages of the Jubilee and Northern line incremental upgrades.

Work has begun at Queen's Park equipment room, with key signalling and control interface equipment installed. This has de-risked later stages of the programme and reduced the delivery timescales. In addition, value engineering has reduced the number of computers needed. The signalling supplier has been sent a scope consultation paper for the Central line signalling incremental project with the technical meeting held in early July.

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	5	338	343	226	(117)
Change since last Investment programme report					
1+5 years rebaselined	(98)	236	138	63	

Financial commentary

The reporting period has been aligned to one plus five years for this report. The EFC of the programme has increased by £138m to reflect updated investment plans to 2028. This EFC change was reported to the Programmes and Investment Committee on 18 May 2022, where additional programme and project authority of £62.9m was granted to support this critical renewal work.

Performance over time

The programme has been re-baselined to a one plus five-year control period.

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 deliver customer service. The fast-evolving IT market requires a programme to keep software in manufacturer support, as well as taking advantage of new technology to improve the way we deliver our services.

Networks and connectivity

We are continuing to work well with our suppliers to upgrade key components of our Connect radio system. Having completed critical software upgrades, we are now focusing on rolling out new radio hardware base-stations. We have replaced key hardware at more than 100 of the required 293 locations. This work will enable the Connect system to function into the 2030s.

We have also delivered Critical Incident Management (CIM) functionality at another eight stations, raising the total to 70 stations with CIM functionality. This enables us to remotely control and evacuate these stations in the event of a critical incident. We are continuing to roll out this important safety functionality, and plan to have completed all works by early 2025.

Assets and staff tools

To improve our approach to asset management and long-term planning, we are consolidating our asset management information systems into a single tool for London Underground and London Trams. We are currently migrating London Underground assets onto this new single platform and have successfully completed the migration of several significant asset classes. The full scope of works is anticipated to be delivered in early 2023.

Data, digital and revenue

We are continuing to deliver a range of measures to tackle fare evasion on the transport network, including the development of a fare evasion dashboard, enhancing our data sources, and developing more robust assessments of revenue loss. We are also launching several tools to assist with the deployment of Revenue Control Inspectors and are continuing to explore new approaches to tackle fare evasion using both Travelcards and pay as you go tickets.

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	287	73	360	319	(41)
Change since last Investment programme report					
No change	25	(13)	12	No change	

Financial commentary

The five-year forecast from 2020/21 to 2024/25 has increased by £12m since the last report.

The movement in spend primarily relates to Old Street Roundabout and the Green Fund. The cost pressures identified on the Old Street Roundabout project by the contractor include an increase in costs due to constrained availability of materials, unforeseen complexities with the temporary site works, and additional resources needed to complete the works by spring 2023.

Additionally, the forecast expenditure relating to the Green Fund grant received from the GLA, has been included under the Healthy Streets portfolio to deliver schemes on both the TfL and borough networks.

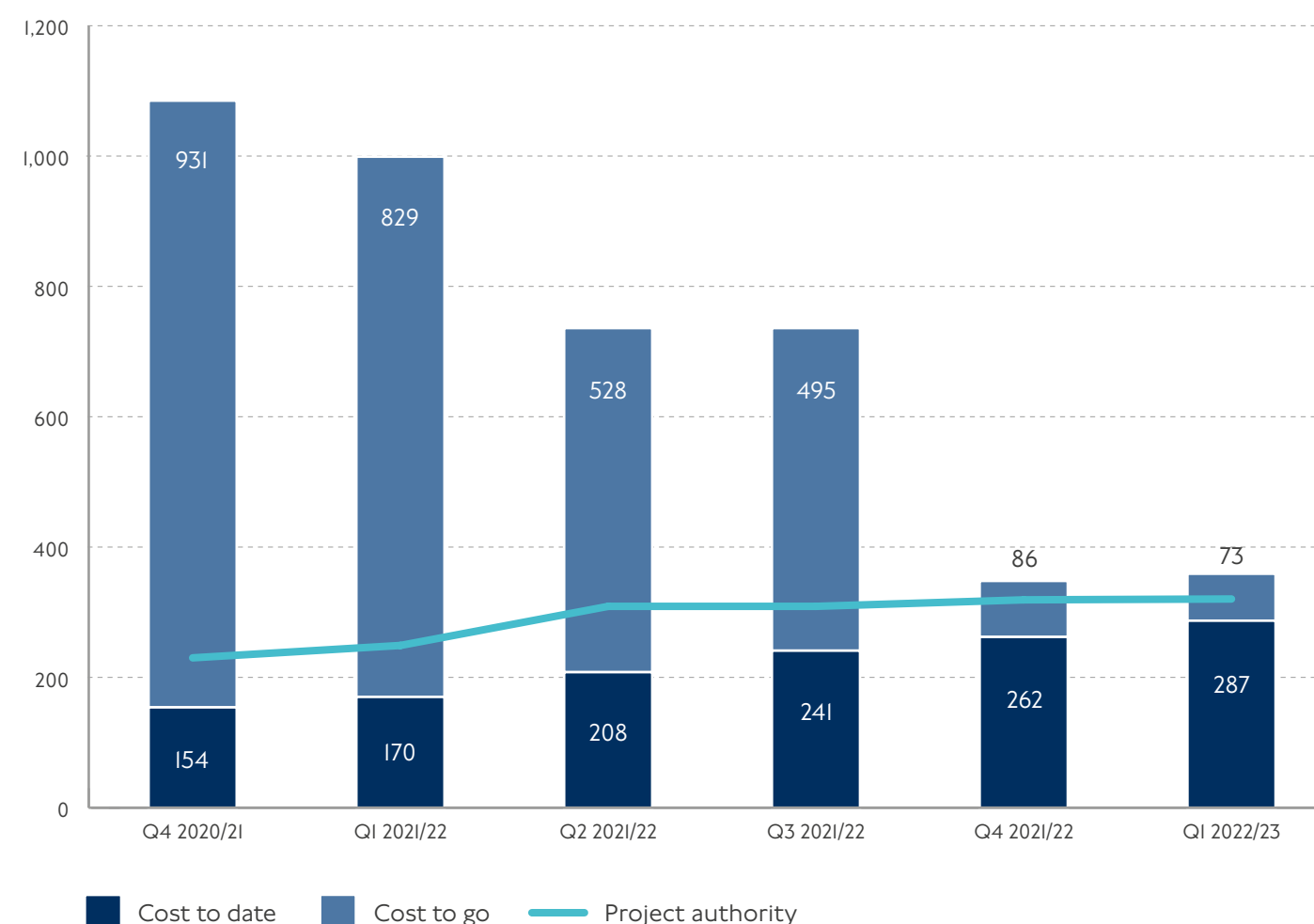
Continued investment in active travel will need to form part of a longer-term, sustainable capital funding deal with the Government. The cost forecasted to 2024/25 in this report reflects the managed decline scenario and is in line with our assumptions made in the recent TfL budget.

Performance over time

Our forecast cost over the last six financial quarters has reduced due to funding challenges driven by the recent pandemic. This has resulted in several projects being put on hold or not started as we moved to a managed decline scenario.

Our programme and project authority has remained in line with the Programmes and Investment Committee approval in March 2022 to cover active travel and safety-related projects across the network.

Estimated final cost performance over time (£m)



Programme update

Despite the very challenging funding situation, the Healthy Streets programme continues to reduce road danger in line with the Vision Zero action plan, and make it easier to walk, cycle and travel by bus across London. It will accelerate progress towards mode shift, decarbonisation, economic recovery and tackling health inequalities.

Healthy Streets complements our other initiatives such as Crossrail, the electrification of the bus fleet and future Road User Charging programmes, as well as helping to power London's wider recovery. Funding, albeit at reduced levels, is provided to London's boroughs to achieve these outcomes on their highway networks.

At the time of writing, no further funding was available for Healthy Streets projects beyond the Fourth Funding Period allocation from central Government, confirmed on 25 February 2022. As such, there is now a significant reduction in project development and delivery across both TfL and borough sub-programmes, as no new external commitments can be entered into until future capital funding is confirmed.

Old Street Roundabout

The Old Street Roundabout project remains on track for completion in spring 2023, with the highway works substantially completed at the end of this year. Construction continues on the paving and kerbing works on the four approach arms to the junction, including the infilling of Subway 1 northeast entrance to the station, which is now completed. The stairs for the southwest entrance to the station, Subway 3, were closed on 15 June following the successful implementation of a new traffic management phase during the weekend of 10–13 June.

Construction of the new concrete shafts for the passenger and goods lifts is complete in readiness for the installation of the new lift cars, which has begun. Construction of the new main station entrance is continuing, with the new entrance opening for public use on 28 July, while work continues on the above-roof structure and glazing. The Subway 3 ramp was closed on 28 July after the main station entrance opened. Refurbishment of the clerestory roof structure is continuing with installation of the external cladding and construction of the bin store.

Cycleway 4

Construction work along Evelyn Street is progressing well, with the focus of works now at New King Street in the London Borough of Lewisham. All remaining works are planned for completion in early autumn. The cycle track on the Creek Road section of the route opened on 29 June. Royal Borough of Greenwich works to Creek Road Bridge have been rescheduled for winter this year to follow on after the Cycleway 4 extension work is complete, so as not to cause too much disruption to the network.

We are assessing whether the works can be undertaken during later phases of the extension works, which are less impactful.

Cycleway 9

Work to transform Hammersmith Gyrotory was completed on 30 June and the cycle track is now open to our customers. Work along Chiswick High Road from Chiswick Lane to Goldhawk Road, which was delivered by the London Borough of Hounslow, was also completed on 8 July, and this section of the route is also open to customers. The next phase of works by the London Borough of Hounslow on Chiswick High Road, between Chiswick Lane and Heathfield Terrace, is due to start on-site in early October.

Responding to the coronavirus pandemic

Borough delivery continues, with more than 20km of cycling routes under construction, all of which should be completed by the end of the financial year. Funding only takes us to the end of September 2022, but at time of writing, everything is on track. The London Borough of Westminster has completed its section of Cycleway 27 between Great Portland Street and Talbot Road. The London Borough of Barking and Dagenham has now substantially completed Cycleway 42, a 4km cycle route between Barking Town Centre and Barking Riverside.

Work is ongoing with the Future of Temporary Schemes Programme, to determine the next steps for each scheme delivered through the Streetspace for London programme.

Works are now complete for the section of Cycleway 8 Upgrade between Chelsea Bridge and Lambeth Bridge, with the scheme having transitioned to an experimental scheme. The public consultation for the experiment was launched on 9 May 2022 and will run for six months. Works also completed for an experimental scheme at Mansell Street in April 2022, providing a connection between Cycleway 2 and Cycleway 3. The public consultation for this scheme also launched in early May 2022, and we will monitor it closely over the coming months to understand how it is operating. A further public consultation was also launched in May for the experimental scheme on the A21 from Lewisham to Catford. Work is also progressing to analyse the results of public consultation and monitoring to inform a decision on whether to retain the experimental cycle schemes on Tooley Street, Battersea Park Road and Kennington Park Road.

The London boroughs have also been reviewing their temporary schemes before the end of the relevant Traffic Regulation Orders and making decisions on whether they should be removed or retained, with or without amendments. Some examples include the London Borough of Hackney, which made 300 School Streets permanent in March 2022; the London Borough of Islington, which agreed to retain Cycleway 38 connecting Holloway Road and Pentonville Road; and Westminster City Council, which will retain 11 cycle lanes across the borough following positive public support.

London boroughs continue to work towards implementation of the new Low Traffic Neighbourhood (LTN) schemes delivered under the Active Travel Fund. Barking and Dagenham is in the final phase of delivery of its four LTN schemes (Barking Town Centre, Pondfields, Five Elms and Southwood) and Haringey is in the final phase of delivery of its three LTN schemes (Bruce Grove, Green Lanes and Bounds Green). They will be ready for operation by the end of September 2022.

The judicial review of the TfL-led A10 Bishopsgate scheme brought by taxi driver bodies and subsequently replaced by an ongoing experimental scheme, resulted in a finding in our favour at the Court of Appeal. The taxi bodies asked the Supreme Court for leave to appeal further, but the Supreme Court has now ruled that there is no legal matter for them to consider, and that costs should be paid to TfL after assessment. This means that the case is now closed.



Old Street roundabout will complete as planned in spring 2023



Lowering vehicle speeds is key to improving pedestrian safety

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. This programme is vital to the Mayor's Vision Zero ambition to eradicate fatal and serious injury collisions from London's roads by 2041.

The second phase of the programme is underway, and as detailed in the recently launched Vision Zero progress report, seeks to reduce speeds by 10mph on a further 140km of our roads.

Raised pedestrian crossings will shortly be introduced in eight locations to further reduce danger to pedestrians and increase compliance with the new speed limit, as well as introducing accessibility benefits for mobility-impaired customers.

Detailed design work is complete on proposals for a 30mph speed limit in Gants Hill town centre, and in progress for the introduction of a 40mph speed limit on the A4 Bath Road, and 20mph in Putney town centre. Concept design work is complete to introduce a new 20mph speed limit on a further 31km of our roads, which we had planned to deliver by the end of 2022 (subject to funding). This would see a consistent 20mph speed limit across most roads in the London boroughs of Camden, Islington, Hackney, Tower Hamlets and Haringey.

Concept design work has also started to lower speed limits on a further 73km of our roads, which comprise the third wave of delivery under Phase 2 of the programme.

Safer Junctions

In April 2017, the Safer Junctions programme highlighted 73 dangerous junctions on our road network with high vulnerable road user collision rates. Work to 43 of these junctions is now finished. Design work continues on the remaining 30 junctions, including detailed design of York Road roundabout and Holloway Road/Drayton Park, which are respectively delivering motorcycle and pedestrian safety measures.

Detailed design work has started on a new 20mph speed limit through the junction of A205 Upper Richmond Road with Putney Hill/Putney High Street, the first phase of a three-stage approach to improve road danger at this location.

In November 2021 a new pedestrian crossing was introduced over Battersea Bridge, where a pedestrian was tragically killed at the beginning of 2021. We are now engaging on proposals to further improve safety for pedestrians and cyclists at the Battersea Bridge junction with Cheyne Walk, which aim to introduce three new pedestrian crossings and better facilities for cyclists.

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	235	201	436	319	(117)
Change since last Investment programme report					
No change	13	23	35	No change	

Financial commentary

The five-year forecast cost from 2020/21 to 2024/25 has increased by £35m since the publication of the last report. This is primarily due to the requirement for a two-phase delivery approach for the in-house delivery of the Business Operations system for Road User Charging, resulting in an increase in the project cost estimate.

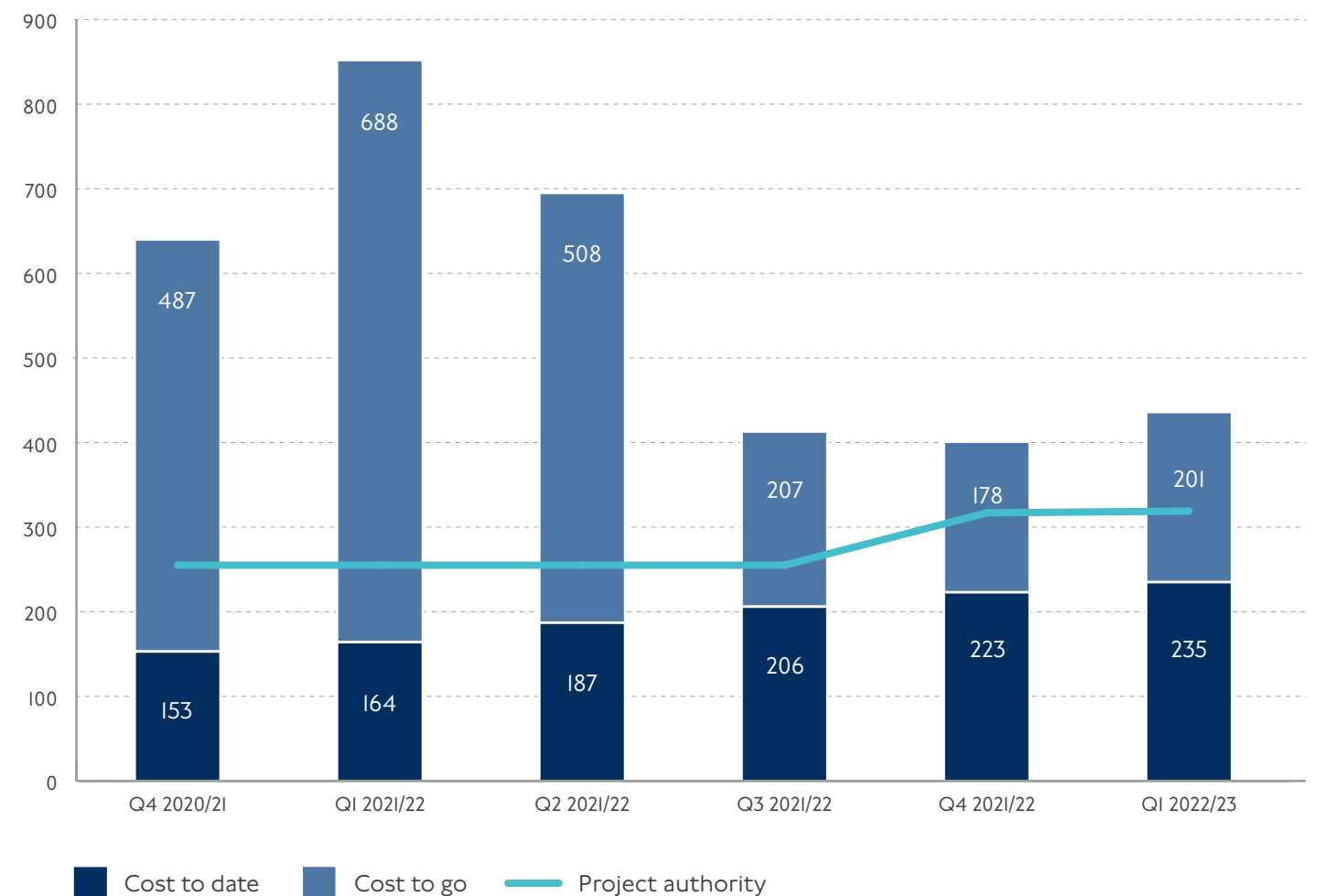
This delivery approach is necessary to ensure coordination and integration with other key Road User Charging schemes, including Tunnel User Charging and the re-let of contracts.

Performance over time

Over the last six financial quarters, our forecast cost has fluctuated, driven by funding challenges brought about by the pandemic, which has meant several projects have been put on hold as we move to a managed decline scenario. Pipeline programmes will remain under review, subject to available funding. The proposed ULEZ expansion for 2023 is not considered part of the air quality forecast while funding is reviewed.

Our programme and project authority has increased following Programmes and Investment Committee approval in March 2022 to cover the Road User Charging Programme Projects to either P8 2022/23 or PI3 2022/23, subject to project development and Mayoral decision.

Estimated final cost performance over time (£m)



Programme update

Electric Vehicle Infrastructure Delivery (EVID)

The number of electric vehicles in London continues to increase rapidly, with new data from the DfT indicating plug-in vehicles made up 20 per cent of all new vehicles registered in London in 2021. With the Government phase-out of petrol and diesel cars and vans by 2030, we must ensure infrastructure delivery keeps up with demand. Our London 2030 Electric Vehicle Infrastructure Strategy (EVIS) forecasts London could need around 40,000 to 60,000 charge points by 2030.

The EVID project is identified as the keystone commitment within EVIS, designed to use land of GLA member organisations to accommodate charge point infrastructure. Work continues at pace on the first tranche, which aims to deliver the initial 100 rapid charge bays.

Following some detailed market engagement, including interviews with key electric vehicle industry suppliers and charge point operators, we have identified a single preferred option for an initial delivery model. The model negates capital investment from TfL or GLA member organisations, while leasing out sites to charge point operators and negotiating a share of revenue. Work is underway to finalise relevant documentation to produce a procurement strategy by the autumn. We have also now assessed more than 1,000 potential charge point locations across the GLA estate, with approximately 70 per cent passing the initial stage of site evaluation.

The first batch of sites is on track to be tendered in the autumn, subject to approval of the procurement strategy.

Zero-emission bus fleet

In the coming years, air quality will be further improved by moving towards a zero-emission bus network no later than 2034, and we could bring this date forward with confirmed funding from the Government. More than 820 zero-emission buses are already in service on multiple bus routes across the capital, helping to tackle climate change and encouraging innovation in British manufacturing with less reliance on vehicles powered by fossil fuels such as diesel, and more electric and hydrogen bus types.

We continue to roll out zero-emission buses, with plans for up to 10 per cent of the fleet to be operated with zero-emission by spring 2023. Future zero-emission orders and full fleet conversion are still dependent on reaching a long-term funding settlement with Government. This would help to reduce carbon emissions in London and fulfil wider climate change goals for the whole of the UK.

Road User Charging

The Mayor's announcement of two significant Road User Charging (RUC) projects in January and March 2022 aimed to take further bold action to tackle London's toxic air pollution, the climate emergency and traffic congestion. The first of these was the proposal for a London-wide expansion of the Ultra Low Emission Zone (ULEZ), potentially in August 2023.

The second was for TfL to explore a smart Road User Charging scheme that could potentially replace existing charges such as the Congestion Charge, LEZ and ULEZ with a single charging scheme that uses more sophisticated technology to make it as simple and fair as possible for Londoners.

The proposed expansion of the ULEZ London-wide would have a significant effect on emissions relative to the cost to Londoners as a whole, as well as helping to tackle the climate emergency and traffic congestion. It is estimated that the number of cars not meeting ULEZ standards each day in outer London would fall from 160,000 to 46,000 and the number of vans from 42,000 to 26,000.

A public consultation on the proposals began on 20 May and ran until 29 July, with analysis of feedback being used to inform the scheme. Following this, the Mayor is expected to decide on the proposal later this calendar year. Also included in the consultation are high-level policy questions that seek the views of Londoners on the potential smart RUC scheme: their responses will be used to guide its early development.

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	244	393	637	494	(143)
Change since last Investment programme report					
No change	27	(182)	(155)	No change	

Financial commentary

The five-year cost forecast from 2020/21 to 2024/25 has reduced by £155m since the publication of the last report, as the portfolio moves into the managed decline scenario, during which we deferred activities under several larger schemes to ensure that an affordable programme can align with our critical asset priorities.

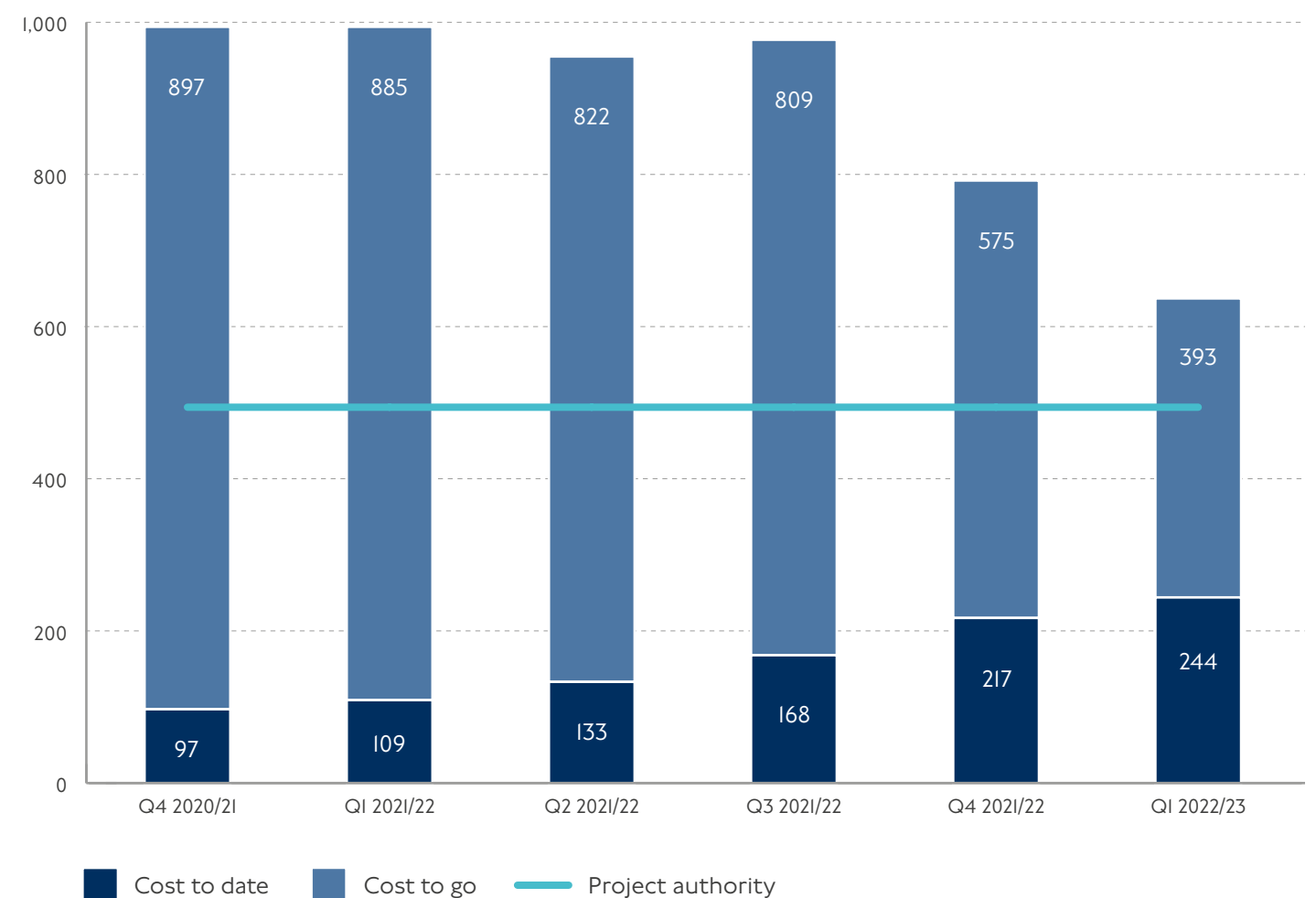
Also, the Asset investment portfolio has delivered more than £3m of cost reductions thus far this financial year: project teams found more efficient ways of working and gained increased value for money from suppliers. This represents an improvement on the savings found at this same stage of the previous financial year.

Performance over time

Over the last six financial quarters, our forecast cost has seen a general decreasing trend, driven by funding challenges following the recent pandemic. This has resulted in several projects being put on hold, as we moved to a managed decline scenario.

Due to the above, our programme and project authority was not required to be changed at the May 2022 Programmes and Investment Committee meeting. This includes all spend up to the end of 2023/24.

Estimated final cost performance over time (£m)





Programme update

Work is underway to ensure the safety and operability of our highest priority assets that need 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. The tender documents for the detailed design and build are being prepared and will be issued in September.

Gallows Corner

The Gallows Corner flyover is one of our highest-priority assets to renew 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. We have submitted a draft business case to the DfT seeking a funding contribution through the Major Road Network (MRN) programme.

We will update and submit a final version of the business case addressing any comments the DfT provide, and anticipate a decision from them by the autumn. Site investigation works have been initiated and the result of these are due by year end. These will feed into the separate concept design package that has been successfully tendered, with a contractor due to be appointed shortly.

A40 Westway

Work on the replacement of a major joint on the Westway, which enables the structure to expand and contract as designed, has been completed ahead of schedule using the weekend and lane closures. The road is now fully open, and no further closures are planned. Some access and drainage works on the underside of the joint have also been completed.

The remaining works on the Westway will be carried out as a separate work package (subject to funding). Concept design work for this package is underway and due to be completed by October 2022.

Westminster Bridge

Hostile vehicle mitigation works began on 15 November 2021. The installation of a new segregated cycle lane, secure bollards and carriageway resurfacing were completed on both sides of the bridge on 3 February 2022.

The remaining works to install footway bollards on three footway corners of the bridge began on 13 June and were completed by 20 July as planned. These works were delayed because of shallow utilities in the footways requiring bespoke design and engagement with their owners to agree the arrangements.

Rotherhithe Tunnel

We have completed the design work and preparation of tender documents for the detailed design and build procurement stages of the project. Owing to the current funding and financing challenges, however, the tendering process for the detailed design and build stage remains paused. A series of short-term capital interventions are being put in place to ensure the tunnel remains safe and operable until the main refurbishment project can be progressed. The procurement activity for some of the short-term capital interventions began in July, with contractor appointments planned for September.

Hammersmith Bridge

The stabilisation works, which involve replacing the seized bearings and repairing the fractures in the bridge pedestals, began on 22 March 2022 and are expected to be completed in November.

Carriageway renewal

Work to renew 130,00 square metres of carriageway continues at pace, with 13,900 metres delivered to date. Schemes have been delivered on the A3220 Cheyne Walk, A503 Camden Road and A4 Great West Road. In the next quarter we plan to deliver more schemes on the network, including A102 Homerton High Street, A41 Hendon Way and A24 Morden Road. Design work to facilitate future years' renewals is also progressing well. Prices and programmes for preliminary design work on all 27 new schemes within the programme have been received from all contractors.



New cycle lane and bollards installed across Westminster Bridge

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	142	327	469	249	(220)
Change since last Investment programme report					
No change	12	(16)	(4)	No change	

Financial commentary

The public transport portfolio is forecasting a decrease in gross expenditure of £4m this quarter.

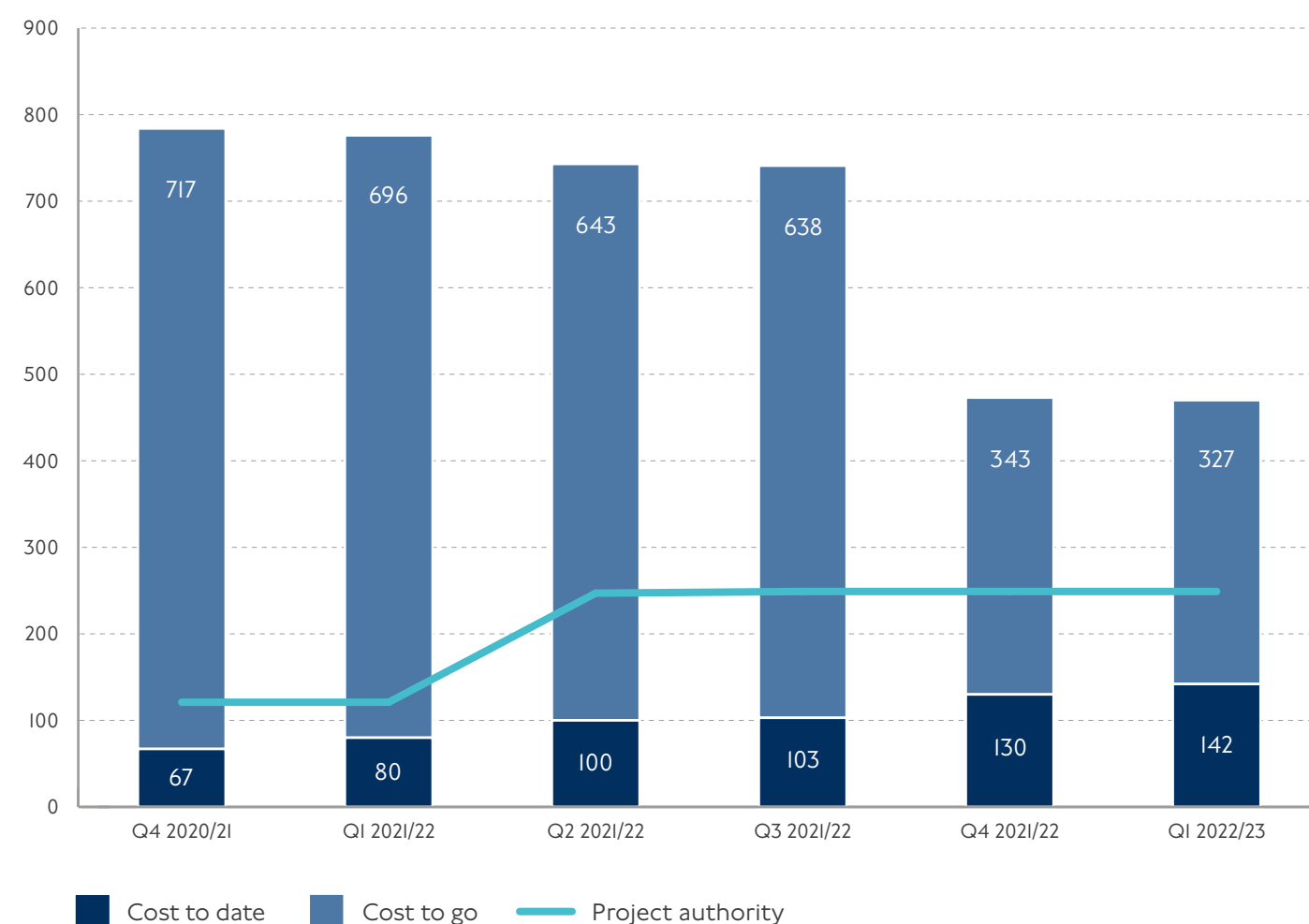
The latest forecast continues to reflect the prioritised renewals assets programme, following the impacts of moving to the managed decline scenario. The New Routemaster refurbishment project, which provides mid-life refurbishment for 1000 buses, forecasted the re-profile of delivery spread into later years (2026), leading to a reduction in expenditure of £2m across the five-year view.

This is in addition to lower spend across a number of renewals in rail, due to lower costs and slippage as the programmes continue to focus on essential investment to meet operational requirements within the funding constraints.

The Bus Customer Action Plan also reflects a reduction in spend, as workstreams have taken longer to mobilise. This reduction is offset by increased cost estimates for the East London Line Housing Infrastructure Fund (ELL HIF), which is funded by the Department for Levelling up, Housing and Communities. The ELL HIF programme now reflects the agreed two-phase approach, with focus initially on Surrey Quays, signalling and power, and bus upgrade. The programme is £6.2m higher in the reported period, due to the new concept design information and inflationary impacts on estimated delivery costs. In addition, acceleration of the delivery profile for tram replacement rolling stock into earlier years has also increased spend.

The five-year view also reflects increased funding required for completion and handover of London Overground projects to Network Rail and Trams project, Sandilands.

Estimated final cost performance over time (£m)





50 Class 710 trains are now running across London Overground

Performance over time

The five-year forecast cost reduced in Q4 2021/22 due to a number of pipeline enhancement projects having to be put on hold as we move to a managed decline scenario.

Our programme and project authority was increased at the July 2021 Programmes and Investment Committee meeting, which includes all spend up to the end of 2022/23.

Programme update

London Overground

We have continued with completion of the GRIP4 (Governance for Railway Investment Projects) design stage as part of our enhancements programme in east London for the ELL infrastructure projects. Phase One of the two-phased approach includes expansion of the existing Surrey Quays station, together with power and signal upgrades.

This is in support of proposed significant housing growth, with the infrastructure being funded through both the Housing Infrastructure Fund (HIF) and developer contributions. The GRIP4 design was signed off in July 2022 and we are awaiting the final revision of the Engineering Compliance certificate.

A paper was approved by the Programmes and Investment Committee on 20 July for endorsement to move forward to GRIP Detailed Design Stage 5 and then the construction phase of these works.

Class 710 trains

Fifty of the 54 Class 710 trains have been delivered by manufacturer Alstom and accepted into use by London Overground. The last four trains, two of which are being used by Alstom for further train software development, are expected to be delivered between Quarter 2 and Quarter 4 2022/23.

DLR

Procurement activities for the renewal portfolio continue, with priority given to critical and safety-related projects. The team, including our contractors, continue to assess the impact of price rises and the availability of materials such as steel and resources in the current volatile market.

The replacement bogie frame project for the B92 train type is progressing well, with 110 new frames ordered and 90 delivered.

High voltage projects have been impacted by the UKPN sub-station fire at Poplar in March 2022, which has required some key projects to be re-programmed so as not to impact services. Royal Mint Street first transformer has been installed successfully and the second is being planned for Q2.

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.

The lift system upgrade project continued to make good progress, with over 50 per cent of the lifts now completed and back into service.

Custom House escalators have been commissioned into service in time for the opening of the Elizabeth line, and works have also been completed at London City Airport. Renewals have now moved to Cutty Sark escalators.

Coper, platform edging stone, tactile and paving installation have been completed at London City Airport, and Bank and Shadwell stations. The life-expired stair treads have been replaced at the Prince Regent station access staircases. The third phase of works has begun at Limehouse Arches, and early engagement with the Canal & River Trust has meant we have secured our licence to work.

The GLA-funded Royal Docks stations' programme has seen tenders sent out for design and build for Royal Victoria and design feasibility for Pontoon Dock.

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. Market engagement began this period to give us an informed view of current tram technology and innovation, and to understand key considerations in light of current market volatility.

The market engagement, plus assessments of the current depot and infrastructure, will complete in the autumn ahead of starting the formal procurement exercise in Quarter 4.

Installation work for both the wayside and on-tram upgrades to tram communication equipment was paused in December 2021 so that the project team can investigate and rectify an increase in the number of communication faults, which are affecting the reliability of tram operations. The decision has now been made to restart wayside installation, which is a precursor to full deployment of a correct-side door enable system on the Bombardier CR4000 trams. The next milestone is to complete the wayside installation works, which is now expected in October 2022.

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 works 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 is scheduled for February 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. It is planned to deliver Church Street track renewal as the first package under this contract in October 2022.

Site works started on 11 April 2022 to replace the retaining wall and step-free access ramp at Birkbeck tram stop. Following completion of site investigations, however, the current plan is to postpone the works until September 2022 to allow existing shallow services to be lowered by utility companies, and for the contractor to adequately protect mature trees within the worksite.

Following detailed investigations and asset condition assessment, the recommendation to proceed with replacing the underframe of Tram 2547 (Bombardier-type tram) was accepted and Alstom instructed to proceed with the works to return the tram to service in April 2023.

A contract was awarded to start the planned works in May 2022 to replace fire doors at the London Trams depot and to ensure compliance with current fire safety standards. However, due to supplier delays, works are now expected to start in November 2022.

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

Santander Cycles

Our Santander Cycles scheme continues to go from strength to strength, with nine months of record usage. Each month between September 2021 and May 2022 saw an improvement on the previous record number of hires. March and April 2022 also saw more than one million hires, the first time this has been achieved so early in the year. There have been more than 12 million hires during the last 12 months – the first time this figure has been achieved during a rolling 12-month period.

The NHS promotional code, which allows NHS employees to access the scheme each day for free with a 24-hour access period, has been redeemed more than 150,000 times since its introduction in 2020.

We continue to progress upgrades and improvements to the scheme this year. We are working closely with Southwark Council to add new docking stations across the borough by the end of the calendar year.

We are also working to introduce 500 electric bikes into the scheme in September 2022, helping to break down the barriers that stop some people from cycling such as fitness, age and journey length. Upgrades to the mobile app will follow later in the year, with QR code bike release functionality and the ability to hire multiple bikes in one transaction.

Woolwich Ferry (London River Services)

The Woolwich Ferry resilience and renewals programme falls under London River Services as part of the Public Transport portfolio. The programme is made up of schemes across varied disciplines, which are currently at various stages of the project delivery life cycle.

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 will support the delivery of overall project objectives (in particular reducing cost), improving safety and making services more reliable.

The focus for the past few periods has been on establishing clear priorities across the work bank and understanding which schemes are able to progress in FY22/23. Over the next few periods these schemes will formally begin the feasibility stage and are expected to develop, with potential design work later in FY22/23.



London River Services seek to improve safety and reliability

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	57	176	233	158	(75)
Change since last Investment programme report					
No change	7	(15)	(8)	No change	

Financial commentary

The five-year forecast cost for 2020/21 to 2024/25 has reduced by £8m since the last report.

The movement primarily relates to iBus2, which is a result of re-phasing the forecast into later, and the Surface Tech Innovation Fund transferring costs out of the capital portfolio.

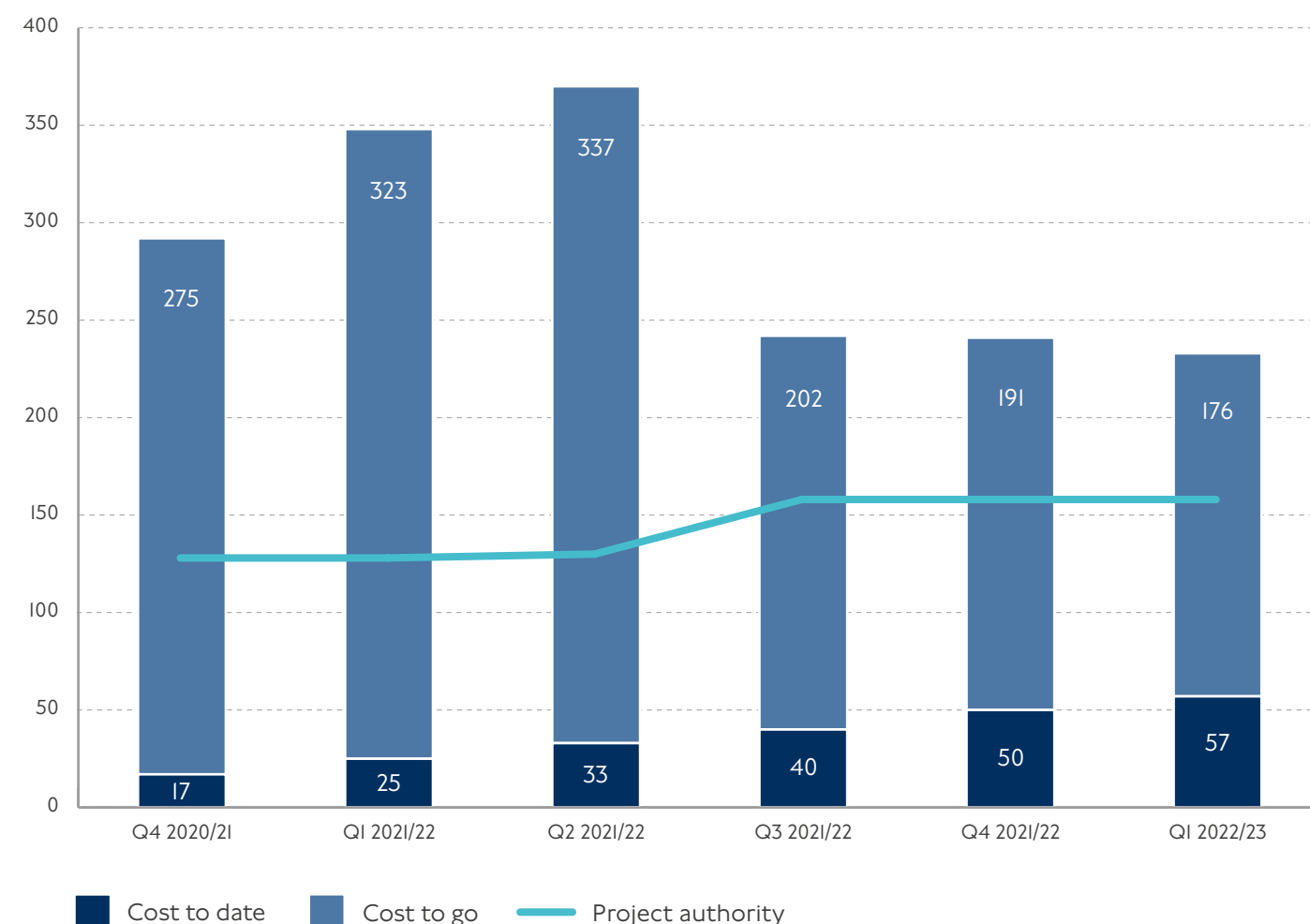
Performance over time

The managed decline scenario in which the programme is currently operating funds only the very few enhancements required to secure legal compliance or future financial sustainability. Any additional funding would significantly improve outcomes from enhancements projects that are currently paused, in key areas such as operational staff safety and reducing delay for road users, particularly people who want to walk or cycle.

The managed decline scenario accounts for a £96m reduction. The team have also delivered cost reductions of £17m and have re-phased the iBus2 project in line with expected supplier spend profiles.

The latest submission to the Programmes and Investment Committee was approved at the meeting on 20 July. The approved submission covers the requirements for 2022/23 and the future year's commitments.

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, which will play a vital part in helping us meet our Vision Zero goal. As of 30 June, all approved sites have had cameras installed on the network. Following successful installation, each location undergoes testing before being brought into live operations.

By the end of July, 40 sites (of 50) were live and fully operational. Early indications suggest that the cameras are having a positive impact: more than 10,000 contraventions have already been identified from the operational sites. These have resulted in more than 1,800 warning notices and over 8,200 PCNs issued.

Road technology

The Surface Intelligent Transport Systems (SITS) programme enables a multi-modal approach to more effectively managing the road network. All road users will benefit from the efficiencies gained by this programme, including those who are walking, cycling, travelling on a bus, in the freight industry or emergency services. The programme remains on track to deliver several vital systems.

Work is continuing on the 'predictive' element of the SITS programme, which aims to revolutionise our approach to managing small- to medium-impact incidents.

Predictive will enable us to respond to incidents more quickly, by using innovative modelling technology. This element alone could reduce the cost of delays to people travelling in London by up to £0.4bn over the next 15 years, representing about one third of the overall benefits of the SITS programme. The work has been paused until funding can be allocated.

The real-time optimiser will replace the legacy urban traffic control system and will optimise timings at almost 6,000 signal-controlled junctions in London, increasing capacity for priority users, which can make journeys quicker and easier for people walking, cycling or on public transport.

The Common Operational View Incident Management System will replace the legacy Traffic Incident Management System and will provide a real-time common view to operators in the Network Management Control Centre of how the road network is performing. The fifth release was deployed on 4 May and has successfully exited early life support.

This has added roadwork information across London and additional mapping layers, further increasing situational awareness for our control centre to better assess the impacts of an incident across different modes and deploy effective management strategies.

Public transport technology

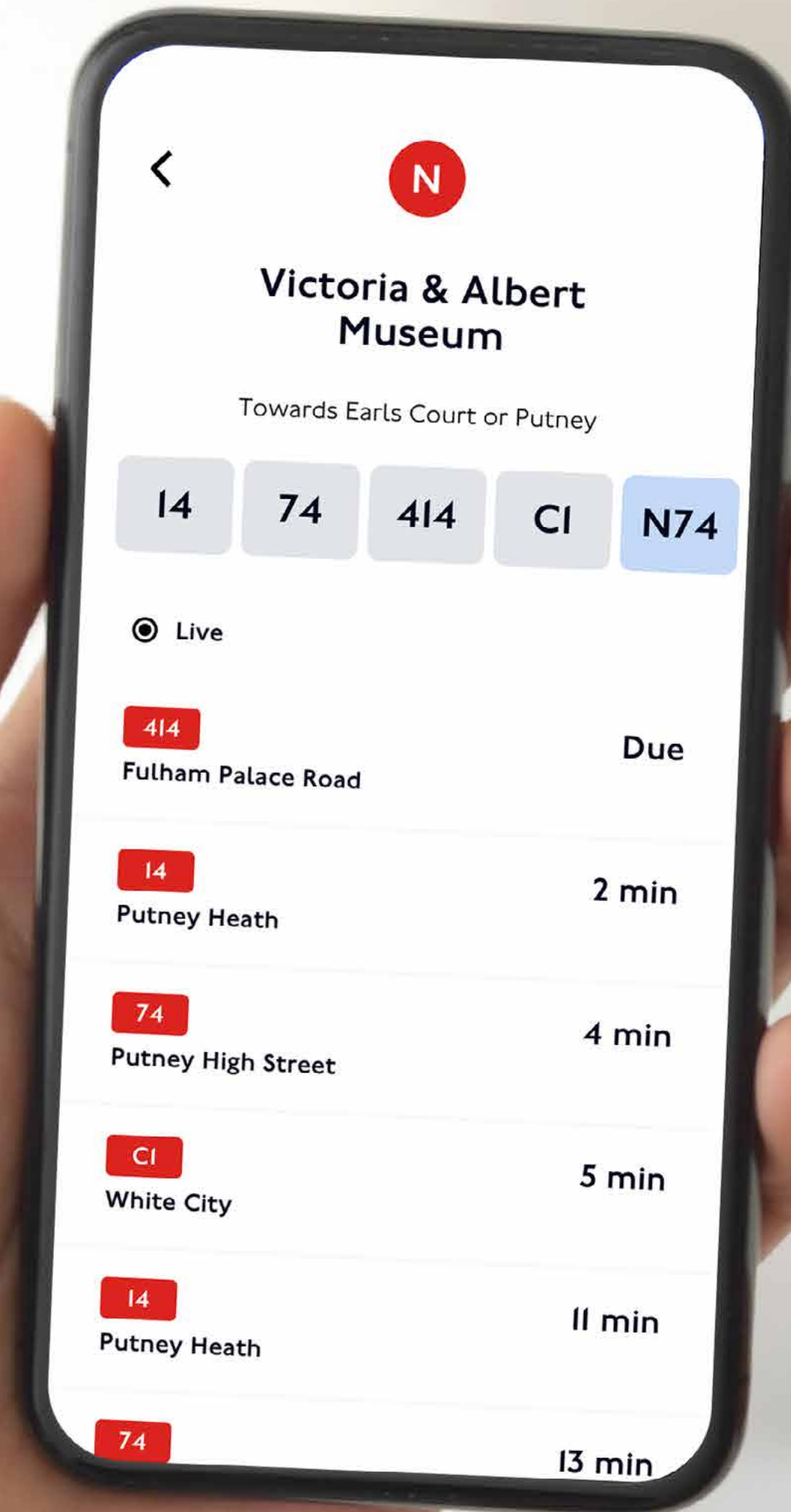
We are maintaining and developing technology to operate our public transport networks and improve customer experience. This includes upgrading the critical technology that underpins the bus network, such as the iBus system, which provides real-time information on bus locations. The tender process to select suppliers for the iBus2 project is progressing well.

Bidders who were successful in the earlier selection questionnaire phase have now submitted their proposals and the team have evaluated the responses. Shortlisting has been carried out, with preferred bidders progressing through to the competitive dialogue phase, which has now begun. This phase will enable the project team to clarify bidders' technical and commercial proposals with them, to ensure that any proposal submitted at final tender represents the best value for money.

Procurement is progressing 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. A further round of negotiation is underway to improve understanding of value for money. The shortlisted bidders submitted their final tenders; the project team is now evaluating them and will soon prepare their contract recommendations. Contracts are expected to be awarded in autumn 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)
2019/20 to 2022/23	224	73	297	327	30
Change since last Investment programme report					
No change	4	(35)	(21)	7	

Financial commentary

The programme and project authority and EFC shown are for financial years 2019/20 to 2022/23 and include additional authority approved by the Programmes and Investment Committee on 2 March 2022.

The values are for Technology and data-funded projects only and exclude the Emergency Services Network (ESN), the public cellular network, telecoms commercialisation projects and Project Oval.

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

Performance over time

Over the first three quarters, forecast spend increased due to income for telecoms being transferred out of this portfolio. Reductions in Q4 21/22 reflected savings and deferrals out of the time period. The movement in EFC since the last report is due to the outcome of capital prioritisation.

Progress update

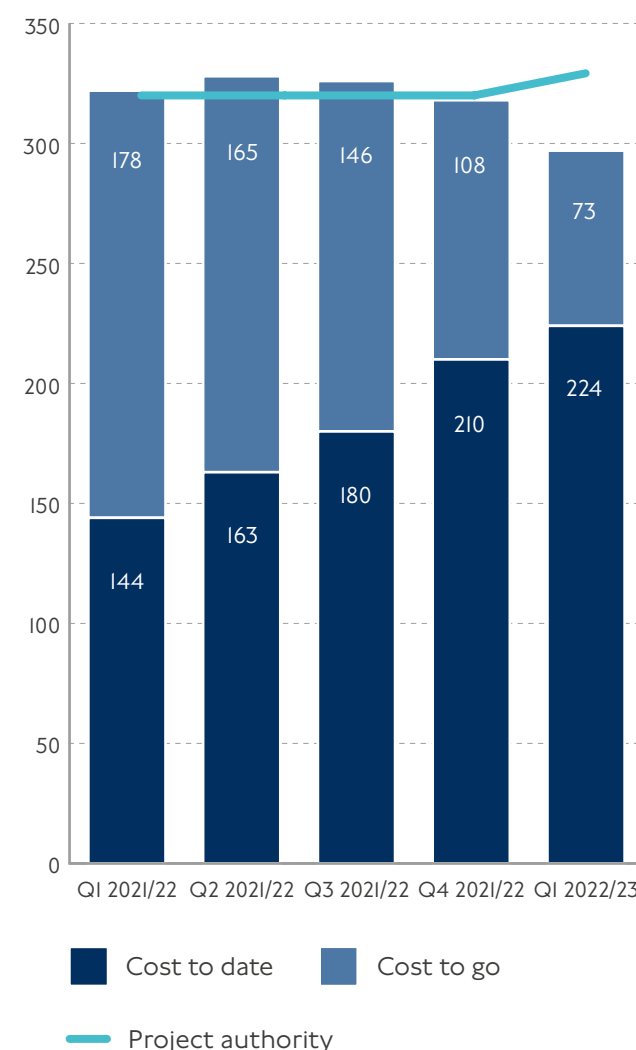
Payments

We are responsible for allocating revenue between TfL and the Train Operating Companies (TOCs). In readiness for the opening of the Elizabeth line, we have successfully updated our revenue allocation system and supported the Rail Delivery Group (RDG) in updating its systems to allocated revenue between the TOCs, which includes the Elizabeth line and London Overground.

The opening of the Elizabeth line creates a brand-new route for cross-London journeys and has required a wholesale rewrite of the basis on which revenue is allocated between the parties.

This is the single largest and most complex change to revenue allocation systems since they were introduced to support rail privatisation in the 1990s. Further changes of similar complexity will be required to support the next phases of the Elizabeth line opening in the autumn.

Estimated final cost performance over time (£m)



The Finance Committee has approved a proposal to extend the revenue collection contract by 12 months. We have since finalised the terms of the extension with Cubic, secured in a binding agreement, and entered this new contract extension, which runs from August 2025 to August 2026.

Each year we commission an external audit of our revenue allocation systems to provide assurance to the TOCs that processes are robust and working as expected. During the last year, the system has experienced significant change due to the introduction of weekly capping for Oyster. Nevertheless, the outcome of the audit was an unqualified report with no concerns or recommendations raised.

Digital workplace

In addition to consolidating all of our legacy versions of Microsoft SharePoint into SharePoint online (addressing significant security, compliance and obsolescence risks), we have also completed the upgrade of the technical elements of TfL Document Manager (TfL DM). The upgrade of TfL DM consisted of both the underlying infrastructure and the application itself, resolving security and obsolescence issues and providing enhanced functionality for approximately 7,000 colleagues across TfL. The upgraded TfL DM service went live on Sunday 17 July 2022.

We have successfully migrated our fixed-line telephony services from legacy ISDN technology to a new SIP-based solution. This work, which included the transfer of more than 30,000 telephone numbers, is a significant milestone in the ongoing upgrade of our core telephony systems and removes our reliance on legacy technology (ISDN) that will be obsolete in 2025.

The upgrade of the Avaya telephony system, which is primarily used in the TfL hub buildings (Palestra, Pier Walk and 5ES) and operational control centres, is ongoing. All mitigations and issues have been resolved and the upgrade planned for September 2022. Aligned with this programme is an initial identification of other operational telephony systems that are not currently under the remit of Technology and data but require updating/transforming. This information will be used to present options and recommendations for next steps.

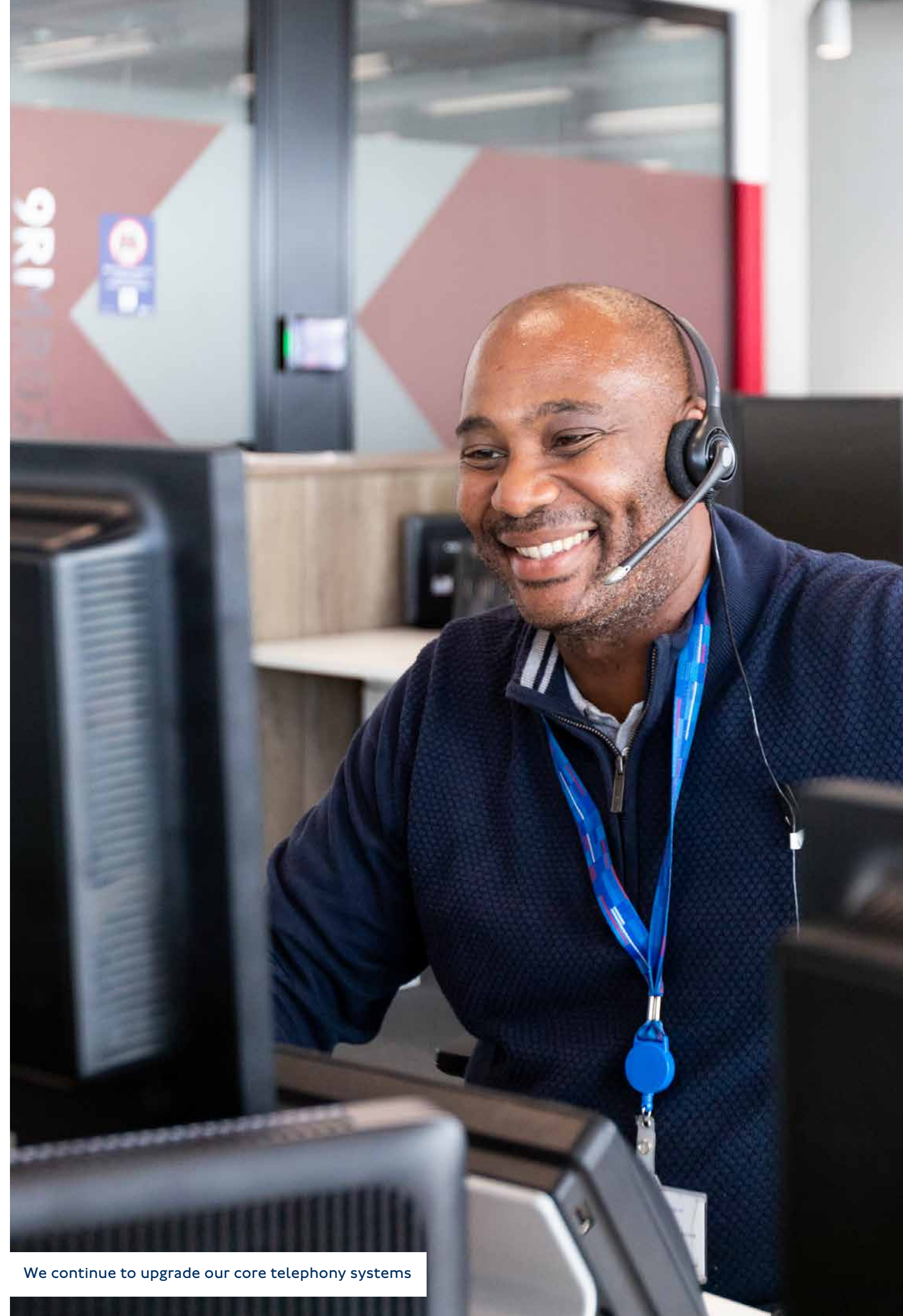
We have completed the third phase of our meeting rooms' upgrade project, which has provided 50 operational locations with Microsoft Teams video conferencing equipment. We have also agreed a project-managed model for continuing to deliver smart meeting rooms where there is business demand. This ongoing model will leverage already purchased equipment, ensuring we maximise use of our investment.

We have mobilised two key strategic projects, the Desktop experience project and the Compliance and retention project, and kick-off workshops have been completed:

1. Desktop experience: a multi-year, multi-workstream project that will ultimately deliver a new desktop to all colleagues within TfL, including both physical devices such as laptops and virtual desktops, essential to hybrid working. This has been partially driven by the retirement of Windows 10 in October 2025, and also changes required to meet the evolving needs of the organisation
2. Retention and compliance: a multi-year project that will address some of the challenges with TfL unstructured data e.g. documents stored in Office365 and network shared drives. This will establish a clear strategy for addressing the challenges, increase security, improve data protection and prioritise an action plan

Hosting

Our programme to refresh end-of-life infrastructure to ensure the ongoing availability and security of our systems continues to progress well. Ninety-one per cent of servers hosting business application services have now been re-hosted on a modern hardware platform. More than 50 per cent of our data (about 12,000,000 gigabytes) stored on end-of-life and legacy storage platforms has been migrated to new and more efficient platforms.



We continue to upgrade our core telephony systems

Seventy-eight out of 375 (20 per cent) mission- and business-critical application services that were operating on legacy end-of-life operating systems and database platforms have been re-platformed on to a modern supportable platform. A total of 788 servers and 1,742 database platforms (forming 73 application services) have also been decommissioned, leading to a cost avoidance of about £1m.

Networks

The service on the transferred Jubilee line public cellular network has operated without interruption and beyond the levels specified in the contract. It continues to operate with all four UK mobile network operators providing service to all UK mobiles. The service continues to enable all mobile network customers to continue to check the latest travel information, keep on top of their emails, catch up on social media and live-stream videos wherever they are on this section of the Jubilee line.

On the wider network roll-out, all four mobile network operators have signed up to the network-wide service (Three, EE, Vodafone and O2).

Looking ahead to the delivery of mobile services elsewhere on the Underground, Technology and data continue to work collaboratively with BAI and other internal TfL functions such as engineering, Safety, Health and Environment and Major Projects in the roll-out of station and tunnel infrastructure. A broad programme of installation is being delivered with more than 300 engineers on-site each night. Management focus has shifted to the

completion of work on the priority stations that form the initial roll-out. Assurance Plans are being finalised ready for submission.

Delivery of the initial stations will be followed closely by the roll-out to adjacent tunnels and stations supported by mobile network operators.

We continue to work closely with the Home Office in the delivery of the ESN, and we are ahead of their schedule to deliver service.

The Connect programme continues to replace London Underground's operational radio base stations. This two-year project has now replaced more than 130 of 293 (44 per cent) base stations. Our planned software updates to the 25 radio dispatcher servers were successfully completed in May 2022, bringing this operationally critical system in line with the currently supported software versions.

Our project to replace the end-of-life data network services that underpin virtually all surface services continues to progress according to plan. To date, we have migrated 2,213 of 4,496 (49 per cent) sites on to the new network delivered by Capita.

Technology Services operations

We have an increasing number of projects in progress to assess suitability of on-premise and Cloud infrastructure for the services they support, and where necessary to improve the network or hosting solution. These projects are to help maintain and protect our business-critical services and are all on schedule for completion within this financial year.

Other key projects relate to software licence and service management. For the initiative to optimise Java licence usage, final checks are being made to ensure we have implemented all technical changes required for this to continue in the long term. For the set-up of a software asset management provider service, planning has started on how we will secure the service we need.

The GLA IT Shared Service project will see TfL assume responsibility for agreed GLA, MOPAC and OPDC IT services over the next two years. Connectivity between the GLA and TfL IT networks has now been achieved, the first major step in a complex IT infrastructure and software application migration. The workstream for supporting GLA end users through the IT changes has also started.

Enterprise resource planning

We need to upgrade and replace our company procurement system as it is no longer supported by SAP, the software vendor. Doing so not only allows us to provide our people with a digital self-service platform, but also to systemise sourcing and contract management supply chain processes. This makes the end-to-end Source to Pay process joined up and more efficient. The new upgraded Cloud-based software is SAP Ariba. Testing for Ariba was completed in July and August, and Sourcing and Contract Management went live in the first week of September. The new purchasing solution will go live by the end of 2022. Communications, training and change management activities for our 3,000 users are ramping up now to promote this.

In 2021, we implemented MyJourney, an SAP SuccessFactors HR solution to manage our people's performance and development. In line with our People and ERP strategy, we are replacing our legacy HR SAP solution (for which support ends in 2027) by implementing further modules of SAP SuccessFactors. Phase 2 of MyJourney is now underway.

Early market engagement with suppliers was completed, business requirements and business case drafted. 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. Focus is now on selecting a supplier from the market.

Lastly, the ERP team has successfully upgraded our payments solution, which encrypts and enables all supplier and employee payroll payments. In February we identified that the existing system would not operate with Microsoft Edge (the new web browser replacing Internet Explorer retired by Microsoft in June 2022), alongside the supplier withdrawal of standard software support.

Working with our accounts payable team, we successfully replaced and upgraded the software, with go-live achieved in June while maintaining supplier and employee payments without interruption.

Contact Centre operations

Following the historic delivery of a successful outsourcing roadmap, reducing our cost to serve by more than £3m per annum, we are now replacing the outsourcing framework that facilitated this saving. The existing framework expired this year, and a replacement is required to continue to leverage the per annum saving and also to provide service continuity to the outsourced contracts currently live. Following market engagement last year, we have now received approval through internal governance and have received initial responses to our Standard Selection Questionnaire.

In addition to providing this critical continuity of service to customers, we are also replacing legacy technology in our Lost Property Office (LPO). We are replacing Sherlock, the LPO primary system, which catalogues items of lost property. This tool has been out of support for more than a decade, and functionality limitations prevent modernisation of LPO processes. Following last year's successful tender of the new tool, we worked closely with the supplier, Not Lost, and ensured they had a successful roll-out in August.

Data analytics

With the opening of the Elizabeth line we have developed a number of reports to support its running, as well as ensuring that new stations are factored into our Wi-Fi solution to allow our Customer and Strategy Directorate to use the data to sell our advertising assets across the network.

We have continued to support the Origin Destination Interchange (ODX) user community across payments and transport planning with the parallel Run and Data Assurance for the new ODX system in production, to ensure a smooth transition from the old to the new system. Alongside this, we have completed historic data migration activity, which means five years of historic data is now available within the modernised ODX platform. These activities are all in advance of the ODX Data Assurance window ending in the coming periods and the legacy ODX platform being decommissioned, at which point support benefits can be realised.

Work was completed to provide reporting on back office changes for POD Code 80 'Issuer Denied Exit' interactions, which will now be allowed onto readers and will be charged. We progressed with the successful development and deployment of a new report to monitor the impact of this change in terms of volume and revenue generated.

Mobilisation for the upcoming CLEO to the Cloud project is well underway, taking our on-premise Data Warehouse with all our customer journey and ticketing data and moving it to a new environment in the Cloud. Our Development team is making a start on early deliverables for Phase I, which will pave the way for our first migration from the outdated and unsupported on-premise hardware underpinning our CLEO Data Warehouse.

Work has continued to migrate a GDPR-uncompliant system to our new reporting solution. We have gone live with one of the final business areas PA&I and we are preparing to go live with our CCO reporting requirements.

Digital

More than 1.7 million customers have downloaded the TfL Go app since it was launched in 2020. We are now reaching more than 500k unique users each month. The app was recognised for its simple and inclusive design at the Drum Awards (Best Mobile/App Design and Chair's Awards) and the Design Week Awards (Best App Design).

We are now testing account, journey history and payment card functionality with a first phase beta release planned for later this quarter. The Elizabeth line was added to the app in May, while recent updates have focussed on improving the information we share with customers during industrial action.

Challenges

Global semi-conductor supply issues are resulting in long lead times. This is impacting our ability to procure and implement new IT infrastructure (delaying project milestones), and increasing project costs as infrastructure demand outstrips supply.

Growth Fund

Reporting period	Forecast £m
2020/21 to 2029/30	2
Change since last Investment programme report	
No change	No change

Programme update

The current budget classifies all future Growth Fund schemes as fully meeting the Mayoral objectives but contingent on additional funding. This means that, although all projects have already secured a strong commitment and a significant degree of third-party funding, a further commitment by Government or other third-party sources is needed to complete the funding packages. The Tolworth scheme remains in the budget as a commitment.

We continue to identify additional funding streams, while supporting all Growth Fund projects with contractual obligations and other urgent milestones by providing case-making and programme-level support.

Challenges

The main challenges continue to centre around ongoing funding uncertainty for Growth Fund projects, which are necessary to unlock new homes and jobs in areas of 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 fully committed to meeting all Mayoral objectives

About Transport for London (TfL)

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

We run most of London's public transport services, including 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 London 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 completed the Elizabeth line in time for Her Majesty the Queen'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.

