

Agenda

Meeting: Programmes and Investment Committee

Date: Wednesday 19 October 2022

Time: 10:00am

**Place: Conference Rooms 1 and 2,
Ground Floor, Palestra, 197
Blackfriars Road, London, SE1
8NJ**

Members

Ben Story (Chair)

Dr Nelson Ogunshakin OBE (Vice-Chair)

Seb Dance

Government Special Representative

Becky Wood

Heidi Alexander

Dr Lynn Sloman MBE

Peter Strachan

Copies of the papers and any attachments are available on [tfl.gov.uk How We Are Governed](https://tfl.gov.uk/How-We-Are-Governed).

This meeting will be open to the public and webcast live on [TfL YouTube channel](#), except for where exempt information is being discussed as noted on the agenda.

There is access for disabled people and induction loops are available. A guide for the press and public on attending and reporting meetings of local government bodies, including the use of film, photography, social media and other means is available on www.london.gov.uk/sites/default/files/Openness-in-Meetings.pdf.

Further Information

If you have questions, would like further information about the meeting or require special facilities please contact: Shamus Kenny, Head of Secretariat; Email: ShamusKenny@tfl.gov.uk.

For media enquiries please contact the TfL Press Office; telephone: 0343 222 4141; email: PressOffice@tfl.gov.uk

Howard Carter, General Counsel
Tuesday 11 October 2022

**Agenda
Programmes and Investment Committee
Wednesday 19 October 2022**

1 Apologies for Absence and Chair's Announcements

2 Declarations of Interests

General Counsel

Members are reminded that any interests in a matter under discussion must be declared at the start of the meeting, or at the commencement of the item of business.

Members must not take part in any discussion or decision on such a matter and, depending on the nature of the interest, may be asked to leave the room during the discussion.

3 Minutes of the Meeting of the Committee held on 20 July 2022

(Pages 1 - 12)

General Counsel

The Committee is asked to approve the minutes of the meeting of the Committee held on 20 July 2022 and authorise the Chair to sign them.

4 Matters Arising and Actions List (Pages 13 - 16)

General Counsel

The Committee is asked to note the updated actions list.

5 Use of Delegated Authority (Pages 17 - 20)

General Counsel

The Committee is asked to note the paper.

6 Investment Programme Report - Quarter 1 2022/23 (Pages 21 - 96)

Chief Capital Officer and Director of Investment Planning Delivery

The Committee is asked to note the paper and exempt supplementary information on Part 2 of the agenda.

7 Independent Investment Programme Advisory Group Quarterly Report (Pages 97 - 100)

General Counsel

The Committee is asked to note the Independent Investment Programme Advisory Group's quarterly report, the management response and the exempt supplementary information on Part 2 of the agenda.

8 TfL Project Assurance Update (Pages 101 - 102)

General Counsel

The Committee is asked to note the paper and the exempt supplementary information on Part 2 of the agenda.

9 Piccadilly Line Update Stage 1 Progress Update (Pages 103 - 118)

Director Investment Delivery Planning

The Committee is asked to note the paper and the exempt supplementary information on Part 2 of the agenda.

10 Elephant & Castle Station Capacity Upgrade (Pages 119 - 128)

Director Investment Delivery Planning

The Committee is asked to note the paper and the exempt supplemental information on Part 2 of the agenda and to approve additional Programme and Project Authority for the sum set out in the paper on Part 2 of the agenda for the Elephant & Castle Station Capacity Upgrade Programme and a corresponding increase in the Major Stations Programme.

11 London Underground Train Systems (Pages 129 - 154)

Director Investment Delivery Planning

The Committee is asked to note the paper and agree that the London Underground (LU) Track, Signalling and Control, Fleet Heavy Overhaul, Fleet Renewals, and Engineering Vehicle sub-programmes be consolidated into a LU Trains Systems programme with a total Programme and Project Authority of £1,791.0m.

12 Docklands Light Railway Rolling Stock Replacement Programme
(Pages 155 - 164)

Director Investment Delivery Planning

The Committee is asked to note the paper and the exempt supplementary information on Part 2 of the agenda and approve additional Programme and Project Authority.

13 Members' Suggestions for Future Discussion Items (Pages 165 - 168)

General Counsel

The Committee is asked to note the forward plan and is invited to raise any suggestions for future discussion items for the forward plan and for informal briefings.

14 Any Other Business the Chair Considers Urgent

The Chair will state the reason for urgency of any item taken.

15 Date of Next Meeting

Wednesday 14 December 2022, at 10am

16 Exclusion of the Press and Public

The Committee is recommended to agree to exclude the press and public from the meeting, in accordance with paragraph 3 of Schedule 12A to the Local Government Act 1972 (as amended), in order to consider the following items of business.

Agenda Part 2

17 Investment Programme Report - Quarter 1 2022/23 (Pages 169 - 188)

Exempt supplementary information relating to the item on Part 1 of the agenda.

18 Independent Investment Programme Advisory Group Quarterly Report (Pages 189 - 194)

Exempt supplementary information relating to the item on Part 1 of the agenda.

19 TfL Project Assurance Update (Pages 195 - 206)

Exempt supplementary information relating to the item on Part 1 of the agenda.

20 Piccadilly Line Update Stage 1 Progress Update (Pages 207 - 214)

Exempt supplementary information relating to the item on Part 1 of the agenda.

21 Elephant & Castle Station Capacity Upgrade (Pages 215 - 224)

Exempt supplementary information relating to the item on Part 1 of the agenda.

22 Docklands Light Railway Rolling Stock Replacement Programme
(Pages 225 - 232)

Exempt supplementary information relating to the item on Part 1 of the agenda.

[page left intentionally blank]

Transport for London

Minutes of the Programmes and Investment Committee

Conference Rooms 1 and 2, Ground Floor, Palestra,
197 Blackfriars Road, London, SE1 8NJ

10.00am, Wednesday 20 July 2022

Members of the Committee

Ben Story (Chair)
Julian Bell
Seb Dance
Peter Strachan (via Teams)

Government Special Representative

Becky Wood

Executive Committee

Andy Byford	Commissioner
Patrick Doig	Group Finance Director and statutory Chief Finance Officer
Stuart Harvey	Chief Capital Officer

Staff

Bruno Carr	Head of Investment Delivery Planning, London Underground and Elizabeth line
Dan Champion	Head of Investment Delivery Planning, Air Quality, Technology and Environment
Andrea Clarke	Director of Legal
Michael Cooper	Director, Project Management Office (via Teams)
Christian Fowler	Head of Investment Delivery Planning, Public Transport
Lorraine Humphrey	Director of Risk and Assurance (via Teams)
Shamus Kenny	Head of Secretariat
Rob Niven	Head of Investment Delivery Planning, Major Projects
James Norris	Interim Head of Project Assurance
Ed Preedy	Chief of Staff, Investment Delivery Planning
David Rowe	Director, Investment Delivery Planning
Rachel Sherry	Finance Director, Major Projects
Lucinda Turner	Director of Spatial Planning

Independent Investment Programme Advisory Group (IIPAG) Attendance

Simon Collins	IIPAG Member
---------------	--------------

31/07/22 Apologies for Absence and Chair's Announcements

Apologies for absence were received from Dr Nelson Ogunshakin OBE and Dr Lynn Sloman MBE. Howard Carter, General Counsel, was also unable to join the meeting and was being represented by Andrea Clarke. Peter Strachan was attending via Teams and was able to take part in the discussions but was not counted toward the quorum. The meeting was quorate.

The meeting was being broadcast live on TfL's YouTube channel to ensure the public and press could observe the proceedings and decision-making.

Financial Authority was currently provided through the two-year Budget for 2021/2022 and 2022/23, approved by the Board on 28 July 2021. As the current funding agreement with Government expired on 28 July 2022, any Authority granted at this meeting that related to both the current funding period and commitments that extended beyond the period of the Business Plan and Budget may need to be revised as part of future budgets to be considered by the Board. If additional funding was not available, a prioritisation of the TfL Investment Programme would be required and some programmes and projects would not be taken forward and revised authority would be sought as appropriate. All approvals given would be overseen in accordance with TfL business controls in respect of draw down.

The Chair reminded those present that safety was paramount at TfL and encouraged Members to raise any safety issues during discussions on a relevant item or with TfL staff after the meeting. No matters were raised.

32/07/22 Declarations of Interests

Members confirmed that their declarations of interests, as published on tfl.gov.uk, were up to date and there were no interests to declare that related specifically to items on the agenda.

33/07/22 Minutes of the Meeting of the Committee held on 18 May 2022

The minutes of the meeting of the Committee held on 18 May 2022 were approved as a correct record and signed by the Chair.

34/07/22 Matters Arising and Actions List

Andrea Clarke introduced the paper, which set out progress against actions agreed at previous meetings of the Committee.

The Committee noted the actions list.

35/07/22 Use of Delegated Authority

Andrea Clarke introduced the item, which provided an update on the use of delegated authority by the Committee, through the use of Chair's Action or of Procurement Authority and Programme and Project Authority, in respect of matters within the Committee's remit, granted by the Commissioner and the Chief Finance Officer.

After the publication of papers for this meeting, one decision had been taken through Chair's Action, relating to the London Underground Four Lines Modernisation

Programme. Following consultation with the Committee, on 13 July 2022, the Chair approved additional Procurement Authority for the Automatic Train Control contract. The reason for urgency was due to the timing of contractual payments. A separate paper on the Four Lines Modernisation Programme appeared elsewhere on the agenda for this meeting (see Minute 40/07/22).

Since the meeting on 18 May 2022, there had been no approval of Procurement Authority nor Programme and Project Authority by the Commissioner or the Chief Finance Officer. There had also been no Mayoral Directions to TfL within the Committee's remit.

The Committee noted the paper.

36/07/22 Investment Programme Report - Periods 11-13, 2021/22

Stuart Harvey and David Rowe presented the Investment Programme Report for Periods 11-13, 2021/22 (9 January to 31 March 2022). Funding uncertainty continued to impact the Investment Programme with many schemes paused. Once a long-term funding settlement is agreed the Programme would be reviewed and refreshed.

During the quarter, TfL continued to implement measures to improve safety, health and environmental performance and focussed on back to basics safety leadership where progress had plateaued.

During the year, TfL had delivered 17 out of 22 strategic milestones for major projects on time or early. Those that had slipped included the Four Lines Modernisation Programme (see Minute 40/07/22) and the Piccadilly Line Upgrade, where inflation challenges were expected to increase the estimated final cost, although good progress was made on the manufacture of the innovative new rolling stock. The estimated final cost for the Silvertown Tunnel remained stable with considerable work underway to remain within its authority level.

Members cited the opening of the London Overground Barking Riverside Extension for revenue service ahead of schedule and below its authority level as a good example of TfL working with the private sector to unlock homes and provide a public transport alternative to car use. The Bank Station Capacity Upgrade Programme remained on time and to cost with the Northern line southbound platform now open. A lot of work had also been undertaken to de-risk the Elephant and Castle project, with the development agreement now signed.

Members noted the progress on London Underground projects, many of which were station enhancements and included further step-free access work, though funding uncertainty meant future step-free access work would require third-party funding. Lifts and escalators work had been completed at South Kensington station, which had made a significant improvement to the station, though Members were disappointed that TfL's planning application for a development on land around the station had been refused and TfL was considering its options.

On Surface programmes, Members noted the progress on the Healthy Streets and Air Quality Programmes, including initiatives to increase the number of electric vehicles charging points. Good progress was being made on Cycleway 4, which was due to complete in summer 2022 and Cycleway 9 had completed, transforming Hammersmith Gyration for vulnerable road users. TfL had recently published its Vision Zero progress report and was progressing initiatives to lower the speed of vehicles, to reduce the likelihood of a collision occurring and the severity of the outcome. Safety critical joints had also been replaced on the Westway. The funding situation meant that the focus on roads was on keeping assets in a safe state of repair but once funding had been secured, safer junctions initiatives could be progressed. The business planning discussions would look at the cost benefit analysis of critical safety works and how they were prioritised against passive renewals in other parts of TfL.

The Chair welcomed the detail included in the high-quality report but requested that consideration be given to consistently referring to quarters, rather than seasons and that the difference between net and gross estimated final costs be explained.

While data had been provided on the original costs of some programmes, this had proved difficult for complex programmes such as the Four Lines Modernisation due to its age and very distinct stages of rolling stock, infrastructure and signalling. Similarly, the Silvertown Tunnel programme's delivery date had changed but the estimated final cost had not due to the funding model. Further explanation would be provided when exceptions to the reporting format occurred and where project were on target due to a reduction in scope or change of circumstances.

The Committee noted the report and the exempt supplementary information on Part 2 of the agenda.

37/07/22 Independent Investment Programme Advisory Group Quarterly Report

James Norris and Simon Collins introduced the report, which provided an update on the Independent Investment Programme Advisory Group (IIPAG) work undertaken between May and June 2022.

IIPAG had undertaken several reviews, including some for programmes on the agenda for this meeting. The report included the findings of the second part of its cross-cutting review of Asset Information. Bringing asset teams across TfL under a single leadership team was showing benefits, including TfL's response to the recent hot weather conditions. It was recognised that the quality of asset data varied across the teams and would benefit from asset modelling and lessons were being learned from the asset data and management of the Elizabeth line. Management had accepted the recommendations and were working to implement them.

IIPAG had made one new strategic recommendation that a set of Key Performance Indicators be developed for renewals programmes.

Members noted the cost pressure in relation to the Old Street project and that the team was working hard and closely with the contractor to manage this.

A new member had been appointed to the IIPAG team, Enrique Fernandez-Pino, who had extensive technology and data experience.

The Committee noted the Independent Investment Programme Advisory Group's quarterly report, the management response and the exempt supplementary information on Part 2 of the agenda.

38/07/22 TfL Project Assurance Update

James Norris introduced the paper, which provided an update on the project assurance work undertaken during Quarter 1 of 2022/23 (1 April to 25 June 2022).

Four programme reviews were undertaken, with the Independent Investment Programme Advisory Group (IIPAG) involved in three of them. In the same timeframe 12 project assurance reviews were undertaken, with IIPAG involved in four of these. These reviews gave rise to a total of 63 recommendations, of which two were defined as critical issues that should be addressed before projects proceed to the next stage. All programmes and project teams had been receptive to the reviews and were addressing the actions.

The response to recommendations was tracked and the number of overdue actions were reducing. It was anticipated that actions currently overdue would be addressed before the next meeting of the Committee.

The Committee noted the paper and the exempt supplementary information on Part 2 of the agenda.

39/07/22 Review of Progress on Value for Money

David Rowe and Ed Preedy introduced the item, which provided an update on the progress to date in developing a comprehensive Value for Money (VfM) programme, designed to complement the extensive cost-saving efforts of the business to achieve financial sustainability by 2023/24. Work had commenced in December 2020 and, in response to advice from the Independent Investment Programme Advisory Group (IIPAG) in September 2021, all VfM initiatives were focussed on addressing economy, efficiency, effectiveness and equity.

The focus of this update was on the improvements in effectiveness (spending wisely) and equity (spending fairly). To address effectiveness, the quality and presentation of business cases had been reviewed as they are key components of decision-making. This included the use of dashboards, improved offline preparation for project gates to allow meetings to focus on key maturity issues and a renewed focus and measurement to ensure the right outcomes were being achieved, including if anticipated benefits were realised. IIPAG and the Project Assurance team would review the changes to pathway and realisation benefits later in the year. The recent strategic recommendation on asset modelling would also improve business cases.

On equity, a lot of work had been undertaken on improving Equality Impact Assessments through engagement with third-party disability organisations and it was recommended that HM Treasury work on measuring social value be considered.

Members welcomed the progress made and the importance of learning lessons from previous projects in terms of benefit realisation and improving business cases. They looked forward to the VfM improvements being reflected in due course in papers to the Committee.

The Committee noted the paper.

40/07/22 London Underground Four Lines Modernisation Programme

Stuart Harvey and David Rowe introduced the item, which provided an update on the delivery of the highly complex Programme.

As reported to the Committee in July 2021, while the infrastructure works had made good progress a combination of factors (linked to software development, installation and subsequent impact of the coronavirus pandemic) had delayed the signalling. An extensive review of cost and time had been undertaken and informed the requested change in Programme and Project Authority. A further update would be provided to the Committee when high risk development of software on the interoperable sections of the Metropolitan line has been progressed.

Signal Migration Area 5 (SMA5) was commissioned in March 2022, with good underlying system performance, although a specific software issue required fixing. To introduce further improvements to the existing sections in service, an additional software update was to be implemented in November 2022 prior to the next SMA going live. Therefore, the schedule for future SMAs going live had been reviewed, with SMA6 and SMA7 (both covering the eastern end of the District line) expected to go live in the first quarter of 2023. The final section of signalling, SMA14 (Rayners Lane to Uxbridge), was expected to go live between spring and autumn 2025. The commissioning of SMA5 would allow for a new timetable to be introduced in September 2022, which would make further improvements to journey times over a wider area. At that time, the entire Circle line would benefit from the improved journey times.

Members discussed the challenges with the software and noted the good collaboration with the supplier. Members welcomed the assurance provided against the review of the Programme. The critical assurance recommendation would be addressed as soon as possible.

The Committee noted the paper and the exempt supplementary information on Part 2 of the agenda and:

- 1 approved additional unbudgeted Programme and Project Authority for the sum set out in the paper on Part 2 of the agenda; and**

- 2 noted that the matters for which Authority was sought above extended beyond the period of the 2022/23 Budget and provision would, therefore, need to be made for them in future Budgets.**

41/07/22 Northern Line Extension

Stuart Harvey and David Rowe introduced the item, which provided an update on the final stages of the delivery and closeout of the Programme, following the successful launch of the Northern Line Extension on 20 September 2021, which had unlocked a huge development area in London.

The paper highlighted some of the early benefits of the project realised to date, including for TfL's supply chain across the UK. While the wider economic benefits were below the original business case baseline, due to the impact of the coronavirus pandemic and the economy on transport demand, the extension had delivered a step-change in public transport accessibility in the area, which was previously poorly served by public transport despite its relatively central location.

TfL was undertaking a comprehensive benefits realisation project to better inform the business cases and funding models for the Bakerloo line extension and Crossrail 2 projects. The Programme had benefitted from a strong focus on value engineering.

Members congratulated all staff involved in the successful delivery of the Programme.

The Committee is asked to note the paper and the exempt supplementary information on Part 2 of the agenda.

42/07/22 London Underground Infrastructure Renewals Programme

David Rowe and Bruno Carr introduced the paper, which provided an update on the progress of the Programme. The Programme included the sub-programmes: Built Environment and Civils, Systems (Power, Electrical, Fire, Mechanical and Communications, Lifts and Escalators), and Safe Track Access. The Programme maintained the safety, operability, and reliability of London Underground (LU) assets through a prioritised programme of renewals.

The paper noted the achievements from the previous updates to the Committee in March 2021 for the LU Renewals Programme, and December 2021 for Lifts and Escalators and the rationale for consolidating these into a single LU Infrastructure Renewals Programme. TfL's current funding situation meant the Programme's budget was based on a managed decline scenario, which meant the condition of assets would decline, therefore the asset strategy team was working hard to prioritise resource allocation supported by addressing the recommendations of the Project Assurance team and the Independent Investment Programme Advisory Group. The focus of the consolidated programme would be on safety and reliability and be data led, learning from the Northern Line Extension and Four Lines Modernisation Programmes.

The Committee noted the paper and:

- 1 agreed that the London Underground Renewals and Lifts & Escalators Programmes be consolidated into a London Underground Infrastructure Renewals Programme with a total Programme and Project Authority of £1,192.2m; and**
- 2 agreed that the London Underground Fleet, Track and Signals Programmes be consolidated into a London Underground Train Systems Programme with a total Programme and Project Authority of £1,790.3m.**

43/07/22 East London Line Housing Infrastructure Programme

David Rowe introduced the paper, which sought additional Financial Authority and Programme and Project Authority to continue the East London Line Housing Infrastructure Fund (HIF) Programme. These works were primarily funded by the HIF and comprised infrastructure upgrades to the London Overground and London Bus networks.

Following approval in June 2020, TfL had authority to enter into the HIF agreement with the Greater London Authority and the Department for Levelling Up, Housing and Communities (the Ministry of Housing, Communities and Local Government as was) (DLUHC) and to progress the initial design stages of the Programme.

Members noted an overview of the progress made by the Programme to date and that a phased approach had now been adopted: Phase 1 would cover Canada Water bus station, Surrey Quays station upgrade, traction power upgrade and signalling upgrade; and Phase 2 would cover Surrey Canal new station and train stabling, with requisite changes to the HIF Grant Determination Agreement. An updated business case was presented for the Programme based on the phased approach along with the financial implications and key risks for TfL from committing to the detailed design and implementation of Phase 1. Phase 2 was being considered as part of a wider programme with the DLUHC.

The Phase 1 work would deliver the most homes and considerable wider benefits to London including environmental benefits and more travel choices and represented value for money for TfL. Phase 1 benefits were not reliant on Phase 2. Lessons were being learnt from the Major Projects Directorate on contractor engagement.

Members discussed the lessons learnt from similar programmes and the process to receive funding and the related conditions for that funding.

The Committee noted the paper and the exempt supplementary information on Part 2 of the agenda and:

- 1 approved additional unbudgeted Financial Authority of £92.65m for the receipt of funds and expenditure on infrastructure upgrades to the London Overground and London Bus networks within Phase 1 of the East London Line Housing Infrastructure Fund Programme;**

- 2 approved additional Programme and Project Authority of £82.09m for the design and construction of infrastructure upgrades to the London Overground and London Bus networks within Phase 1 of the East London Line Housing Infrastructure Fund Programme and further design activities for infrastructure upgrades to the London Overground within Phase 2 of that Programme; and**
- 3 noted that Procurement Authority for the design of infrastructure upgrades to the London Overground and London Bus networks would be sought at officer level in accordance with Standing Orders.**

44/07/22 Public Transport Programme

David Rowe introduced the item which requested additional Programme and Project Authority for the continuation of the Programme until the end of 2024/25. The Programme maintained the safety, operability and reliability of the surface public transport network through the delivery of a prioritised programme of planned and reactive renewals.

Members noted an update on the progress of the Programme and the financial allocations by mode for 2022/23 and 2023/24, demonstrating how the spend aligned with the asset strategy for each Public Transport mode. The request for Programme and Project Authority for the East London Line Housing Infrastructure Fund programme had been considered earlier in the meeting (see Minute 43/07/22).

TfL's current funding situation meant the Programme's budget was based on a managed decline scenario, which meant the focus was on safety and reliability using State of Good Repair metrics and obsolescence across a wide range of assets, which were supported by the assurance reviews. The assurance reviews had identified some areas for improvement including on asset data. The Programme was well governed but was diverse and so consideration would be given to reviewing what was in the scope of the Programme.

The Committee noted the paper and:

- 1 approved additional budgeted Programme and Project Authority of £54.9m for the continuation of the Public Transport Programme through to the end of 2023/24; and**
- 2 noted that the matters for which Programme and Project Authority was sought included commitments that extended beyond the period of the current Budget and appropriate provision would, therefore, need to be made for those commitments in future Business Plans and Budgets.**

45/07/22 Surface Technology Programme 2022/23

David Rowe introduced the paper, which set out the progress of the Programme and requested additional Programme and Project Authority to cover delivery in 2022/23 and commitments in future years.

The Programme consisted of renewals projects required to ensure operations within Surface Transport retained the technology capabilities to operate safely and efficiently. It also contained a small number of enhancements projects that supported this aim within the managed decline scenario. Projects were within three key focus areas: Roads Technology; Compliance, Enforcement and Safety Technology; and Public Transport Technology.

Members noted Programme activity and the proposed transfer of scope into and out of the Programme, and an overview of planned investment in 2022/23. Attracting and retaining technology specialists remained a challenge. A larger bank of projects than would be delivered were listed to provide flexibility to progress projects if others slipped, to avoid a repeat of the underspend in 2021/22. The assurance reviews supported the Programme, recognising the risk to delivery from resource constraints and the need to improve project forecasting. As TfL moves to its new operating model, consideration will be given to merging the Programme with the London Underground Technology Programme.

The Committee noted the paper and exempt supplementary information on Part 2 of the agenda and:

- 1 approved £15.2m Programme and Project Authority for the Surface Technology Programme, taking cumulative authority to £154.1m;**
- 2 approved transfer of the Innovation Fund out of the Programme into operating expenditure, which had no impact on the Programme's Programme and Project Authority;**
- 3 noted that the matters for which Authorities were sought above included commitments that extended beyond the period of the 2022/23 Budget and provision would, therefore, need to be made for those commitments in future Budgets; and**
- 4 noted that Procurement Authority for the various initiatives would be sought at officer level in accordance with Standing Orders.**

46/07/22 Road User Charging

David Rowe introduced the item, which summarised the key developments in road user charging (RUC) since the update to the Committee in March 2022, as part of the wider Air Quality and Environment Programme annual submission. The paper focused on the progress of the three newest proposed RUC projects, London-wide Ultra Low Emission Zone (ULEZ), Scrappage Scheme and Future RUC along with an assessment of the likely requirement for additional Programme and Project Authority to the end of 2022/23, totalling £53.7m, which would be requested once TfL's current funding position was clearer.

The six-month update on the impact of the ULEZ showed good progress in reducing toxins in the air as the rate of compliant vehicles was higher than originally forecast. Members noted the interdependencies in the schemes and the authorities would be

sought once TfL's current funding position was clearer through Chair's Action. The assurance reviews supported the projects and recommended a clear strategy, in addition to the business cases, to help improve the governance and management of the projects as a single Programme.

The Committee noted the report and the exempt supplementary information on Part 2 of the agenda.

47/07/22 Members' Suggestions for Future Discussion Items

Andrea Clarke introduced the current forward plan for the Committee. The requests for further papers would be added to the plan.

The Committee noted the forward plan.

48/07/22 Any Other Business the Chair Considers Urgent

There was no urgent business.

49/07/22 Date of Next Meeting

The next scheduled meeting of the Committee would be held on Wednesday 19 October 2022 at 10.00am.

50/07/22 Exclusion of the Press and Public

The Committee agreed to exclude the press and public from the meeting, in accordance with paragraph 3 of Schedule 12A to the Local Government Act 1972 (as amended), when it considered the exempt information in relation to the items on: Investment Programme Report, Periods 11-13, 2021/22; Independent Investment Programme Advisory Group Quarterly Report; TfL Project Assurance Update; London Underground Four Lines Modernisation Programme; Northern Line Extension; East London Line Housing Infrastructure Programme; Surface Technology Programme 2022/23; and Road User Charging.

The meeting closed at 13.00pm.

Chair: _____

Date: _____

[page left intentionally blank]

Programmes and Investment Committee



Date: 19 October 2022

Item: Matters Arising and Actions List

This paper will be considered in public

1 Summary

1.1 This paper informs the Committee of progress against actions agreed at previous meetings.

2 Recommendation

2.1 **The Committee is asked to note the Actions List.**

List of appendices to this report:

Appendix 1: Actions List

List of Background Papers:

Minutes of previous meetings of the Programmes and Investment Committee.

Contact Officer: Howard Carter, General Counsel
Email: HowardCarter@tfl.gov.uk

[page left intentionally blank]

Programmes and Investment Committee Action List (reported to the meeting on 19 October 2022)

Actions from previous meetings of the Committee

Minute No.	Description	Action By	Target Date	Status note
72/12/21 (1)	<p>Investment Programme Report – Quarter 3, 2021/22: Value for money and Benefit-Cost Ratios</p> <p>The Committee asked that, where available, the value for money (VfM) calculations be included in future reports and, in instances where a project has been descoped, it be shown how that increased the VfM and how the Benefit Cost Ratio has changed.</p>	Stuart Harvey / David Rowe	Ongoing	Work is ongoing; the IPR report will continue to be refined as and when data is available.
72/12/21 (2)	<p>Investment Programme Report – Quarter 3, 2021/22: Tottenham Hale station</p> <p>A background note on Tottenham Hale station would be circulated to Members to set out how the project was delivered against the original estimated final cost and delivery date.</p>	David Rowe	October 2022	A note will be provided.
24/05/22	<p>London Underground Technology Programme – portfolio prioritisation</p> <p>Members would receive an update on work done on the business planning process and prioritisation to determine allocations for portfolios in the second half of 2022.</p>	David Rowe	September - December 2022	This is being addressed in business planning discussions for Members.
27/05/22	<p>Members' Suggestions for Future Discussion Items</p> <p>Members asked to visit the Old Street project.</p>	Secretariat	November 2022	Dates will be canvassed for November 2022.

[page left intentionally blank]

Programmes and Investment Committee



Date: 19 October 2022

Title: Use of Delegated Authority

This paper will be considered in public

1 Summary

- 1.1 This is a standing item on the agenda to inform the Committee of any use of delegated authority by the Committee, through Chair's Action, or of Procurement Authority and Programme and Project Authority (in respect of matters within the Committee's remit) granted by the Commissioner and the Chief Finance Officer in accordance with delegated authorities under TfL's Standing Orders since the last meeting of the Committee. The paper also provides information on Mayoral Directions to TfL within the Committee's remit.
- 1.2 Since the last meeting of the Committee, on 20 July 2022, there have been:
- (a) no uses of specific authority delegated by the Board;
 - (b) two uses of Chair's Action, in relation to road user charging and Heathy Streets: Active Travel and Bus Priority Programmes;
 - (c) no approvals of Programme and Project Authority or Procurement Authority by the Commissioner nor by the Chief Finance Officer; and
 - (d) no Mayoral Directions within the Committee's remit.
- 1.3 A similar report is submitted to the Finance Committee and the Land and Property Committee in respect of the use of Chair's Action and of Authorities granted by the Commissioner and the Chief Finance Officer and of relevant Mayoral Directions that fall within the remit of those Committees.

2 Recommendation

- 2.1 **The Committee is asked to note the paper.**

3 Use of authority delegated by the Board

- 3.1 There have been no uses of authority delegated by the Board since the last meeting of the Committee.

4 Use of Chair's Action

- 4.1 Under Standing Order 113, in situations of urgency, the Board delegates to each of the Chair and the Chairs of any Committee or Panel the exercise of any functions of TfL on its behalf, including the appointment of Members to

Committees and Panels. Any use of Chair's Action is reported to the next ordinary meeting.

- 4.2 There have been two uses of Chair's Action since the last meeting of the Committee:

Road User Charging

- 4.3 On 12 September 2022, Members received a follow-up paper to that considered at the previous meeting on 20 July 2022. The paper summarised the key developments in road user charging (RUC) as part of the wider Air Quality and Environment Programme annual submission. Specifically, progress of the three newest proposed RUC projects (potential London-wide Ultra Low Emission Zone (London-wide ULEZ), potential Scrappage Scheme and Future RUC), along with requests for additional Programme and Project Authority for these and the Business Operations in-house project, totalling £177.2m.
- 4.4 On 14 September 2022, the Chair, in consultation with available Members, noted the paper and the exempt supplementary appendix and: approved additional Programme and Project Authority of £177.2m to support the continued development of the following proposed RUC projects: London-wide ULEZ, Scrappage Scheme, Future RUC and Business Operations in-house giving a total Programme and Project Authority of £523.2m for RUC; and approved additional Procurement Authority in the sums requested in the exempt supplementary appendix to extend the contracts with Capita Business Services Limited and Siemens Mobility to continue activities in support of the proposed London-wide ULEZ, Scrappage, Business Operations in-house, Tunnel User Charging and Future RUC projects.
- 4.5 The use of Chair's Action was considered appropriate to enable the Committee to make an informed decision following the Government funding agreement of 30 August 2022, discussions for which were still underway when the previous paper was presented to Committee for noting on 20 July 2022.
- 4.6 The paper has been published on the [TfL website](#) but the appendix remains exempt from publication.

Heathy Streets: Active Travel and Bus Priority Programmes

- 4.7 On 4 October 2022, Members received a paper requesting additional authority for the continuation of the Healthy Streets Programme in the remaining periods of 2022/23 and 2023/24, following confirmation of allocated funding for Active Travel and Local Implementation Plans in the 30 August 2022 Government funding agreement.
- 4.8 On 6 October 2022, the Chair, in consultation with available Members, noted the paper and: approved additional unbudgeted Financial Authority and Programme and Project Authority of £215m to support delivery of the Healthy Streets Programme, bringing the total Healthy Streets Programme and Project Authority to £530.6m; and approved additional unbudgeted Financial Authority of £24.8m and Programme and Project Authority of £25m to support delivery of Other Active Travel as described in the paper, including Borough Cycle Training, Customer

Marketing and Communications, Asset Renewals, Direct Vision Standard Phase 2, e-bikes and e-scooter trial.

- 4.9 The use of Chair's Action was considered appropriate as additional Programme and Project Authority was needed to enable delivery to commence in the current financial year in line with the funding and parameters set out in the Government funding agreement of 30 August 2022.
- 4.10 The paper has been published on the [TfL website](#).

5 Programme and Project Authority Approvals

- 5.1 To enable an appropriate level of governance, processes are in place for the authorisation, control and reporting of projects.
- 5.2 Programme and Project Authority will normally be granted by the Committee for all programmes and projects as part of the defined Programmes within the overall Investment Programme. Where individual programmes or projects have a value in excess of £50m and have not already received full approval as part of a Programme, requests will be submitted to the Committee for consideration. Those programmes and projects with an estimated final cost of £50m or below, which have been approved by the Commissioner or the Chief Finance Officer, will be reported to subsequent meetings of the Committee.
- 5.3 Where the main contract has not yet been awarded, the Financial Authority and Estimated Final Cost may not be stated because they are commercially confidential.

Approvals by the Commissioner and Chief Finance Officer

- 5.4 Since the last meeting of the Committee, neither the Commissioner nor the Chief Finance Officer has approved any Programme and Project Authority requests within the Committee's remit.

6 Procurement Approvals

Approvals by the Commissioner and Chief Finance Officer

- 6.1 Since the last meeting of the Committee, neither the Commissioner nor the Chief Finance Officer has approved any Procurement Authority requests within the Committee's remit.

7 Mayoral Directions to TfL

- 7.1 The Greater London Authority Act 1999 (as amended) permits the Mayor to issue to TfL general directions as to the manner in which TfL is to exercise its functions or specific directions as to the exercise of its functions (or not to exercise a power specified in the direction). Directions are also often made in relation to the implementation of matters in respect of which the Mayor delegates statutory powers to TfL.
- 7.2 The Mayor makes Mayoral Directions through Mayoral Decisions. Papers for Mayoral Directions set out the financial and other implications. If those

implications change over time, that will be reported to the Greater London Authority (GLA).

- 7.3 All Mayoral Decisions are issued in writing, with the information that is not exempt from publication included on the GLA's Decisions Database on its website: <https://www.london.gov.uk/about-us/governance-and-spending/good-governance/decisions?order=DESC>.
- 7.4 Mayoral Directions fall into three broad categories: those addressing technical issues relating to statutory powers; those related to commercial development activities; and those related to projects and programmes. Mayoral Directions relating to TfL are reported to the Board's Committees for discussion as soon as possible after they are received by TfL or published. Regular reports will list the relevant Directions for as long as they are applicable.
- 7.5 Annually the Audit and Assurance Committee considers the list as part of its consideration of the annual audit plan to ensure that appropriate audit resource is applied to assurance on TfL's work in implementing Mayoral Directions. This will also be kept under review at each quarterly meeting of that Committee.
- 7.6 A summary of current Mayoral Directions to TfL is maintained on the [How we are governed](#) page on our website, with links to the relevant Mayoral Decisions. That page will be updated as and when further Directions are made.
- 7.7 Mayoral Directions to TfL related to projects and programmes are reported to this Committee. There have been no Mayoral Directions to TfL within the Committee's remit since the last meeting.

List of appendices to this report:

None

List of Background Papers:

None

Contact Officer: Howard Carter, General Counsel
Email: HowardCarter@TfL.gov.uk

Programmes and Investment Committee



Date: 19 October 2022

Item: Investment Programme Report Quarter 1 2022/23

This paper will be considered in public

1 Summary

- 1.1 The Investment Programme Report describes the progress and performance in Quarter 1, 2022/23 of a range of projects that will deliver world-class transport services to London.
- 1.2 A paper is included on Part 2 of the agenda which contains exempt supplementary information. The information is exempt by virtue of paragraph 3 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the business affairs of TfL. Any discussion of that exempt information must take place after the press and public have been excluded from this meeting.

2 Recommendation

- 2.1 **The Committee is asked to note the report and the exempt supplementary information on Part 2 of the agenda.**

List of appendices to this report:

Appendix 1: Investment Programme Report Quarter 1 2022/23

Exempt supplemental information is contained in a paper on Part 2 of the agenda

List of Background Papers:

None

Contact Officers: Alex Williams, Interim Chief Customer and Strategy Officer
Email: GarethPowell@tfl.gov.uk

Contact Officers: Andy Lord, Chief Operating Officer
Email: AndyLord@tfl.gov.uk

Contact Officers: Stuart Harvey, Chief Capital Officer
Email: StuartHarvey@tfl.gov.uk

[page left intentionally blank]

Investment programme report

1 April 2022 – 25 June 2022

Appendix I

Contents

3 Introduction

- 4 Purpose and scope
 - 5 Investment programme delivery structure
-

6 Our performance

- 7 Safety performance
 - 11 Schedule performance
 - 12 Strategic milestones
-

15 Major projects

- 16 Rolling stock
 - 18 Crossrail
 - 20 Four Lines Modernisation
 - 22 DLR rolling stock and systems integration
 - 24 Piccadilly line upgrade
 - 26 Northern Line Extension
 - 27 Silvertown Tunnel
 - 29 Barking Riverside Extension
 - 31 Bank station capacity upgrade
 - 32 Elephant & Castle
 - 34 High Speed 2
 - 36 Railway systems enhancements
-

37 London Underground

- 38 Stations and depots
 - 41 Step-free access
 - 42 Built environment and civils
 - 44 Lifts and escalators
 - 45 Track
 - 46 Passenger fleet
 - 48 Signalling
 - 49 Technology
-

50 Surface transport

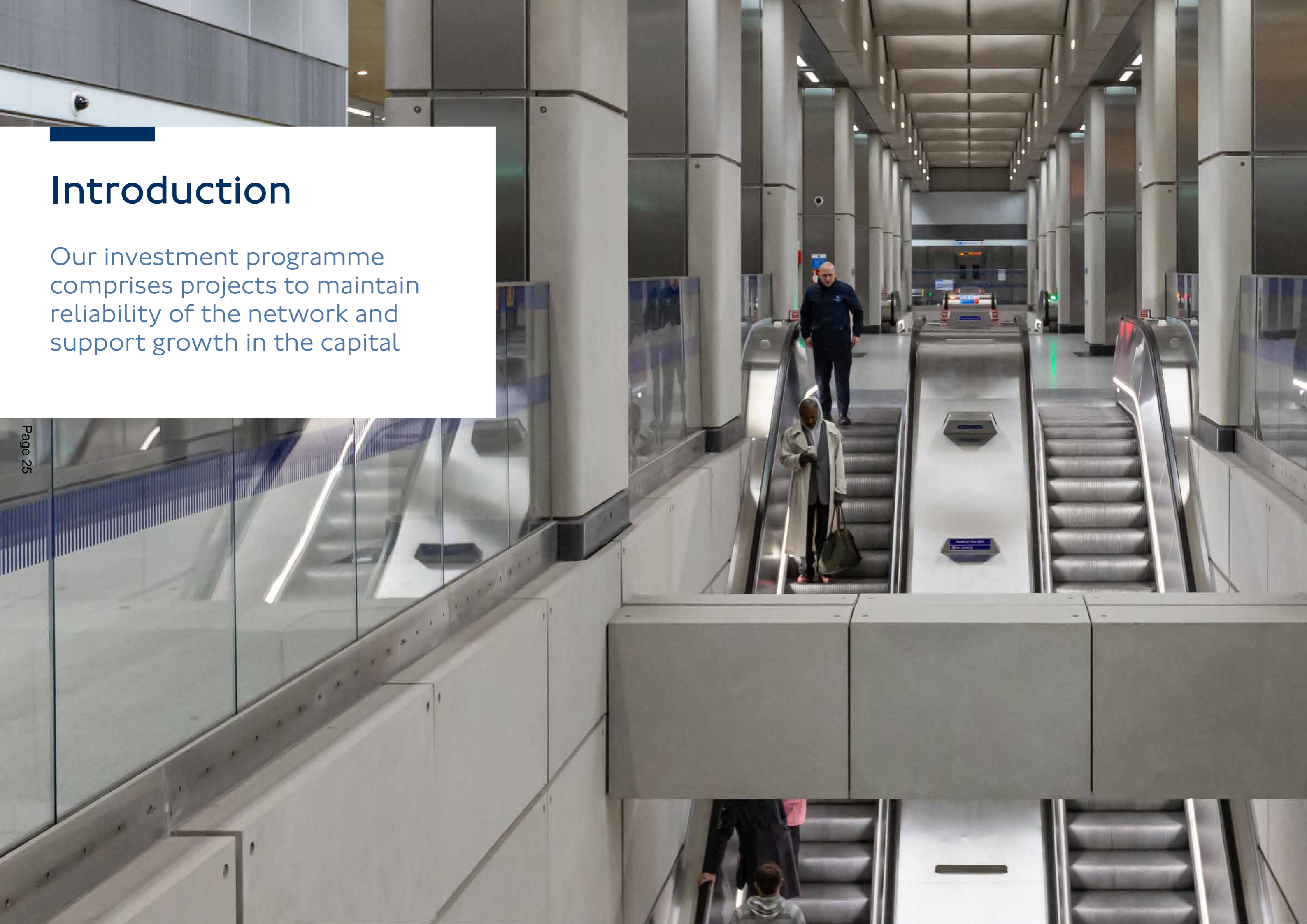
- 51 Healthy Streets
 - 55 Air quality
 - 57 Asset investment
 - 60 Public transport
 - 64 Technology
-

66 Professional services

- 67 Technology and data
 - 71 Growth Fund
-

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.

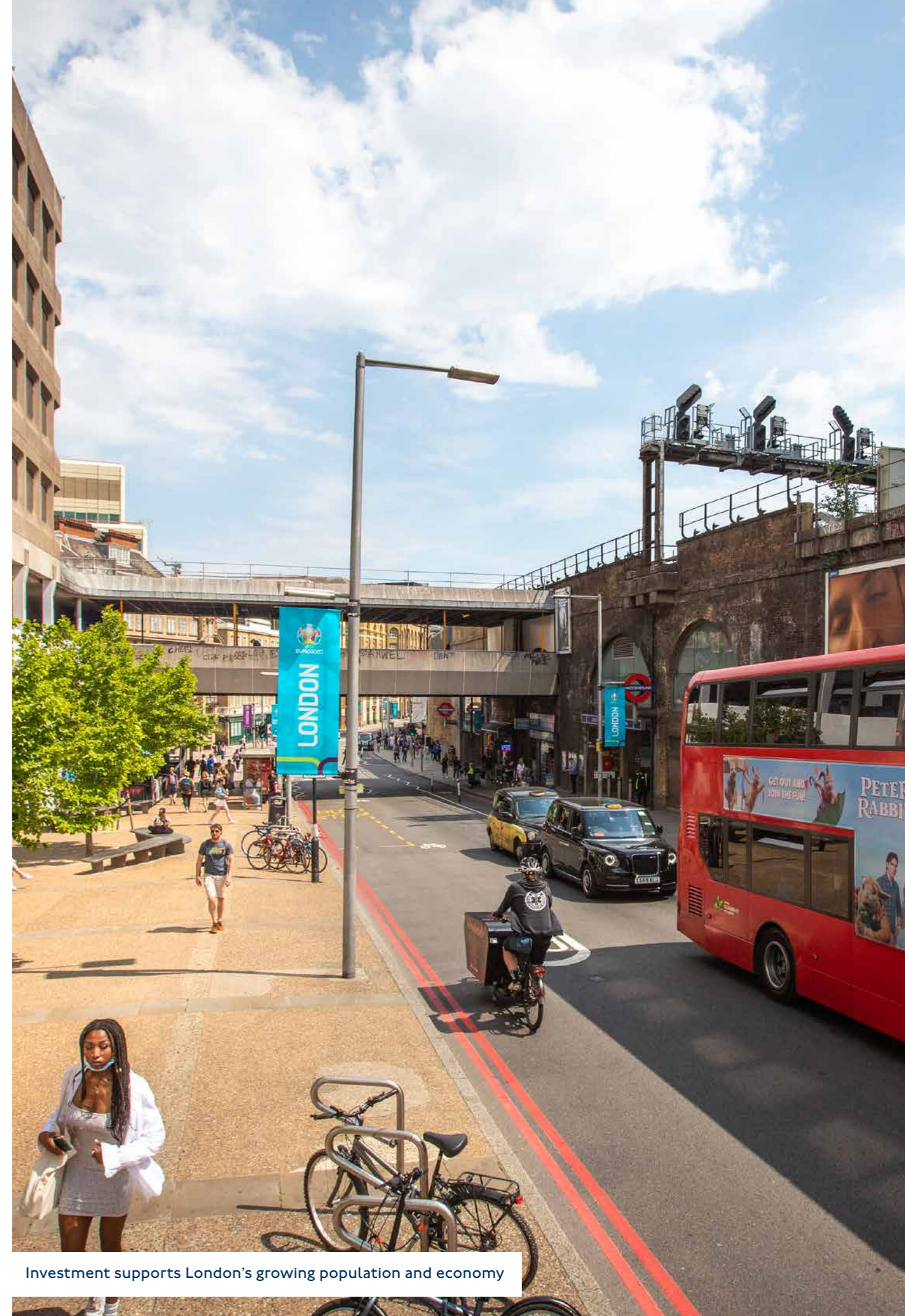
The data displayed differs depending on whether the programme or portfolio has a finite scope to deliver:

- 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



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



09/28

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.

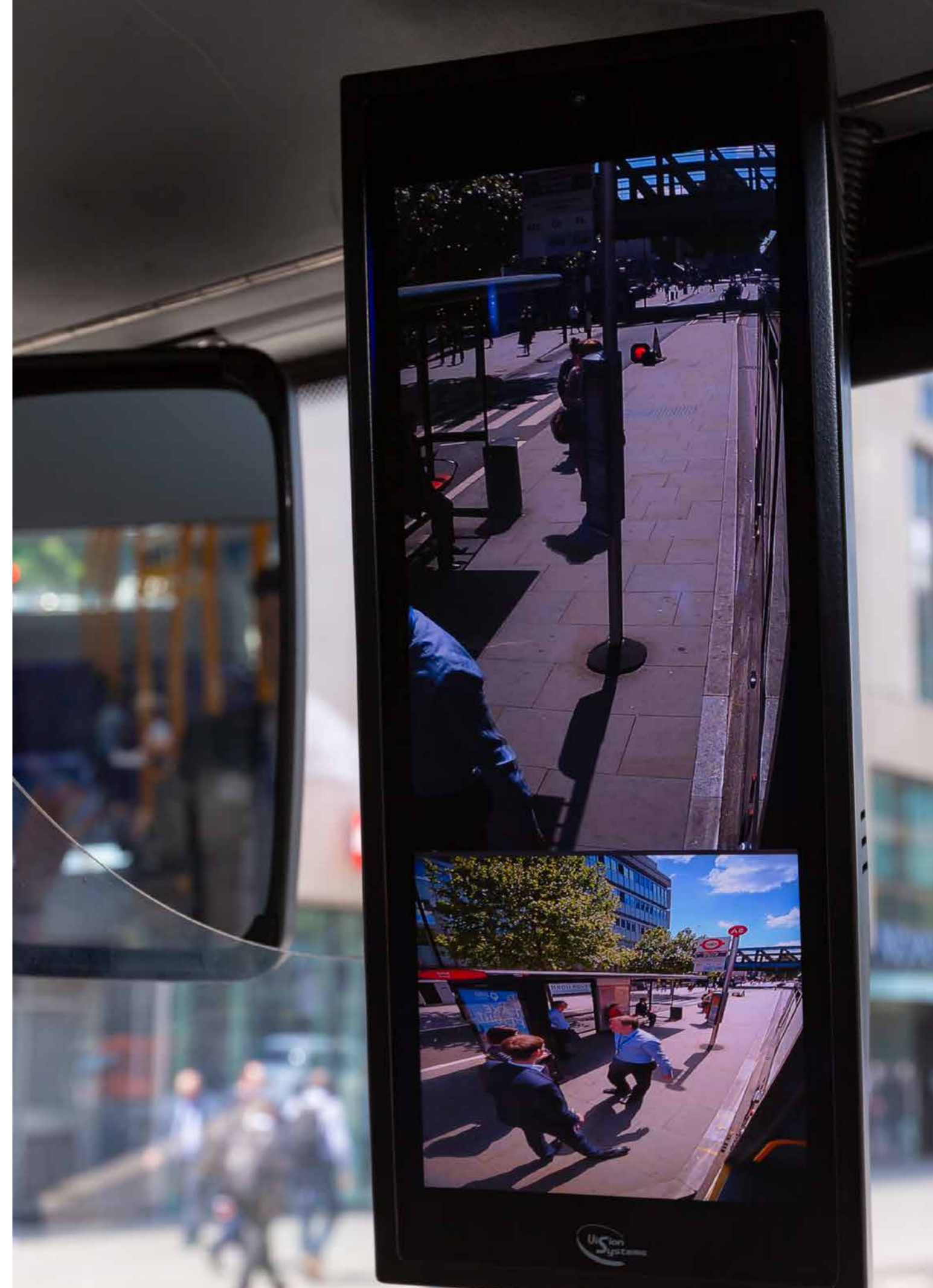
Coronavirus remained the top cause of short-term staff absence, but significantly decreased as a proportion of staff absence: from 59 per cent in Quarter 4 to 30 per cent in Quarter 1. Mental health and musculoskeletal-related health remained the top two causes of long-term absence, which is in line 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

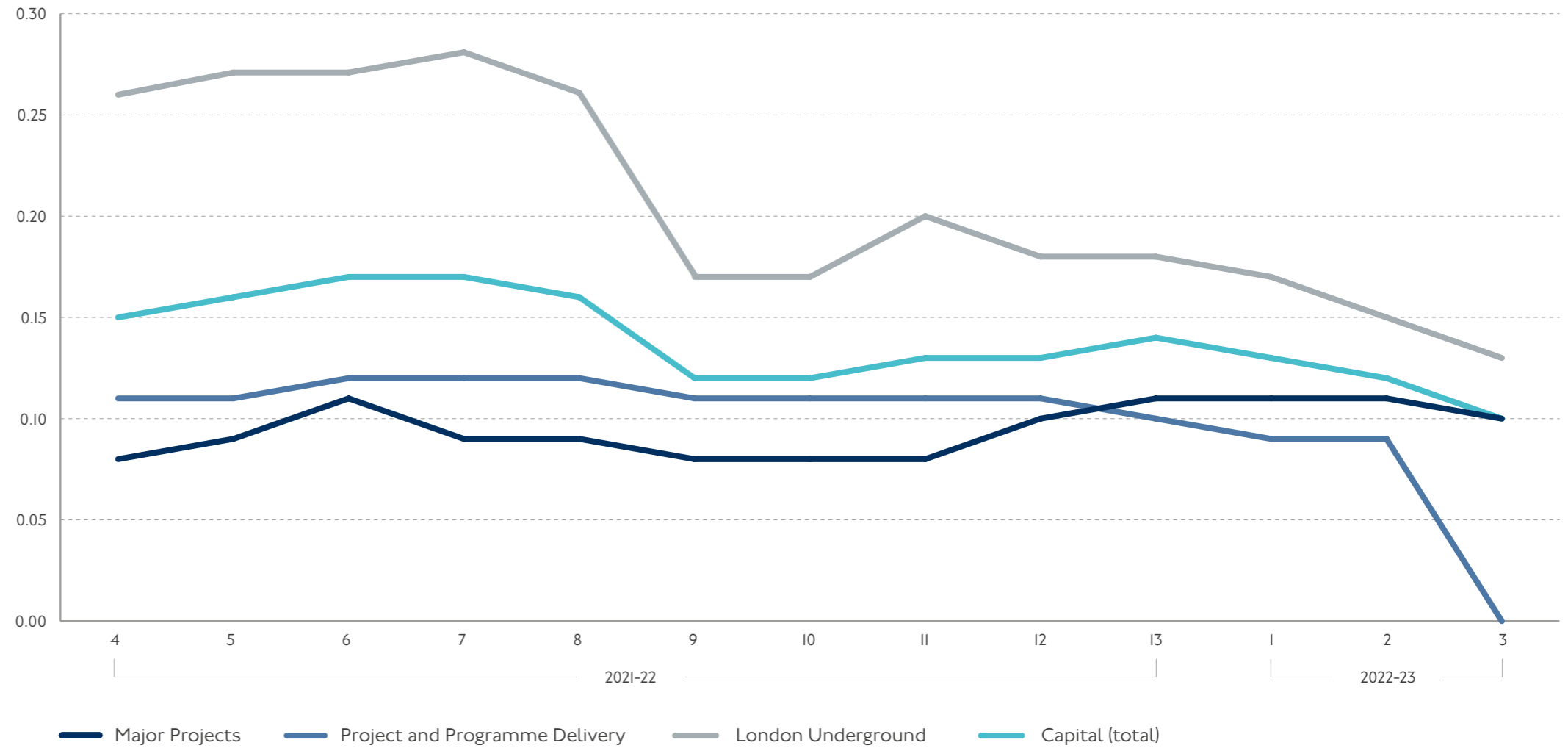
To enable accurate analysis of data, some of our key measurables are quoted as a frequency rate per 100,000 hours worked. Frequency rates are calculated using a moving annual average based on performance over the previous 13 periods.



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)

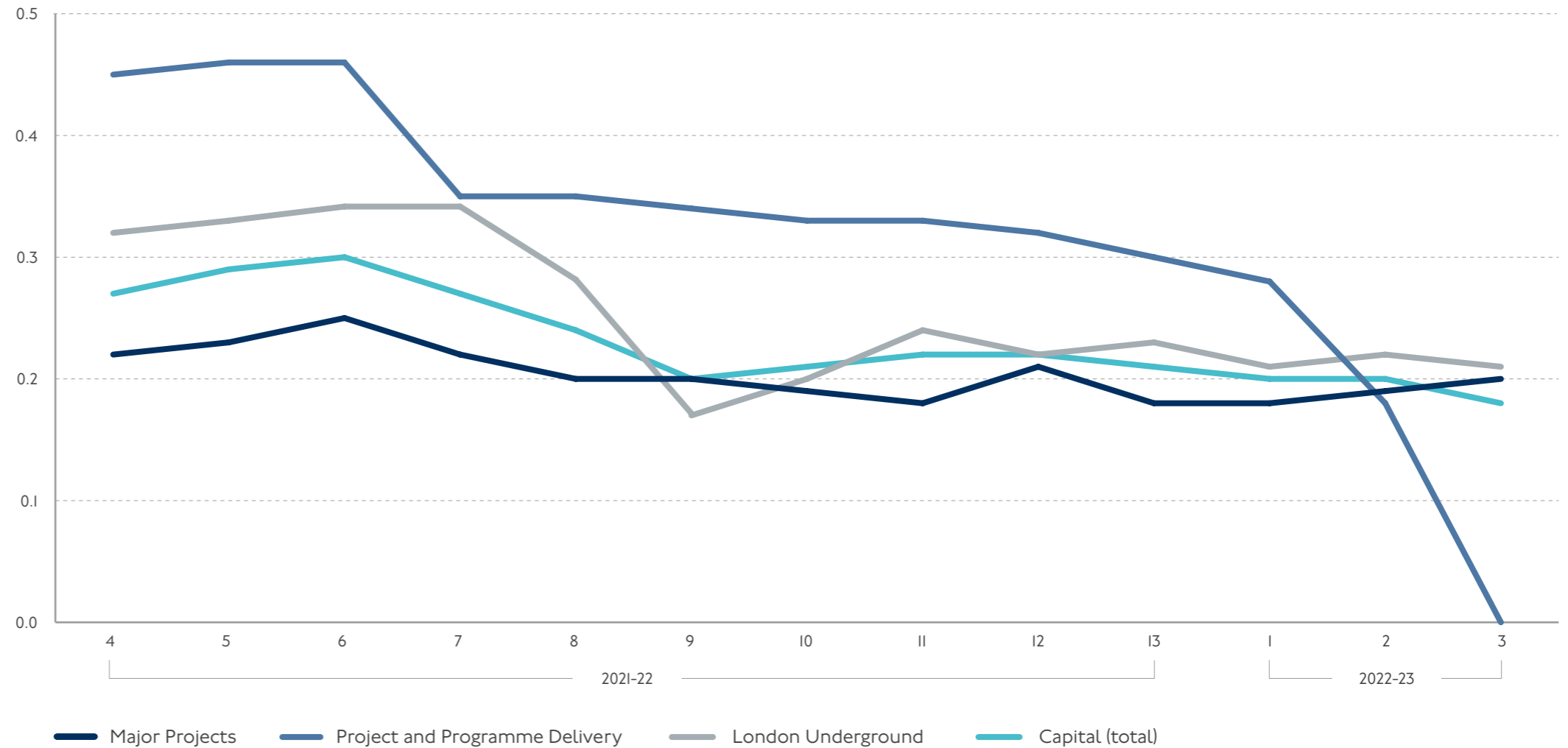


Lost time injuries (LTIs) are injuries that cause an employee to be absent for one or more shifts. There were three LTIs reported in our capital teams during Quarter I, a decrease of four on Quarter 4 2021/22. Consequently, the lost time injury frequency rate for the capital area, and all teams within 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.

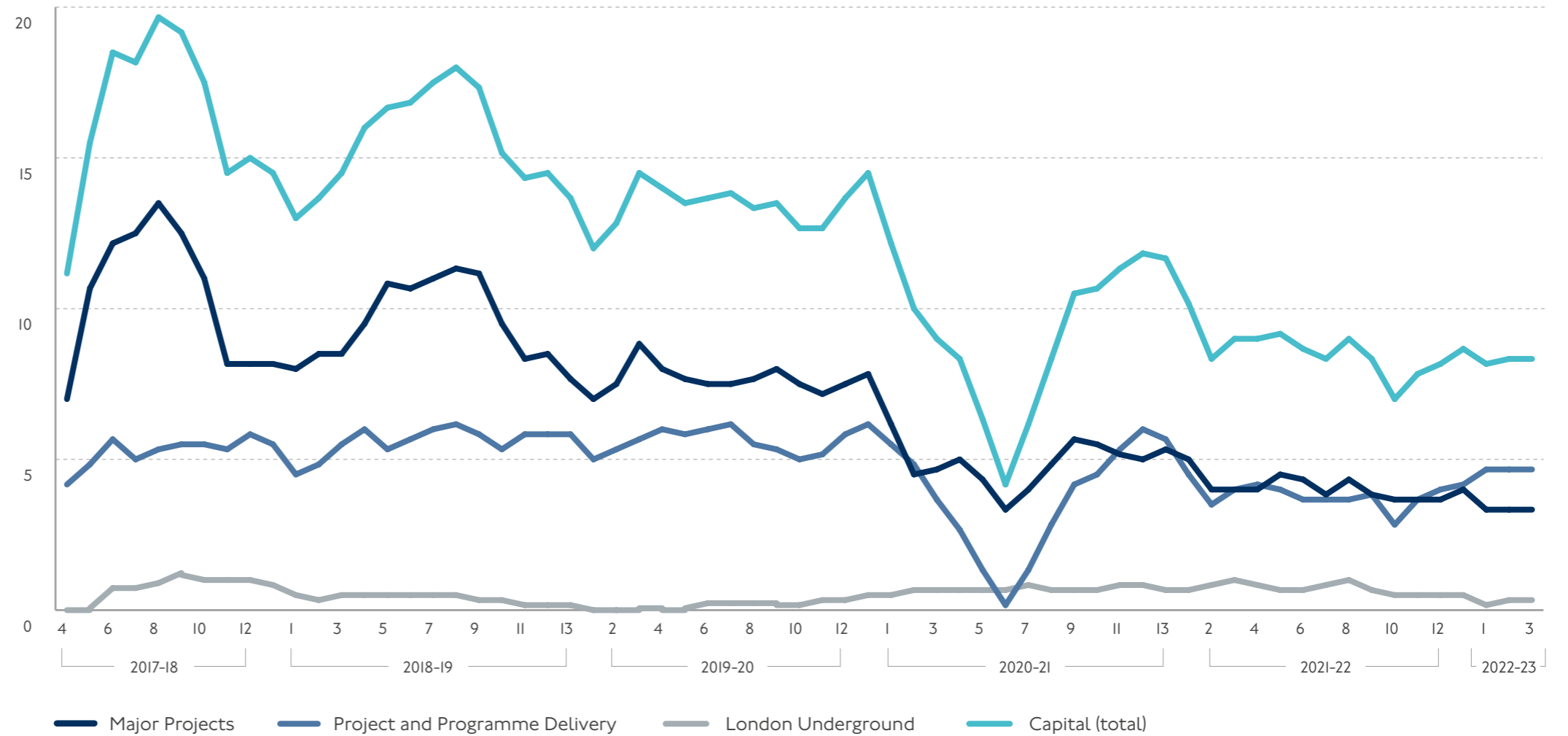
Lost time injury frequency rate
(per 100,000 hours worked)



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)



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

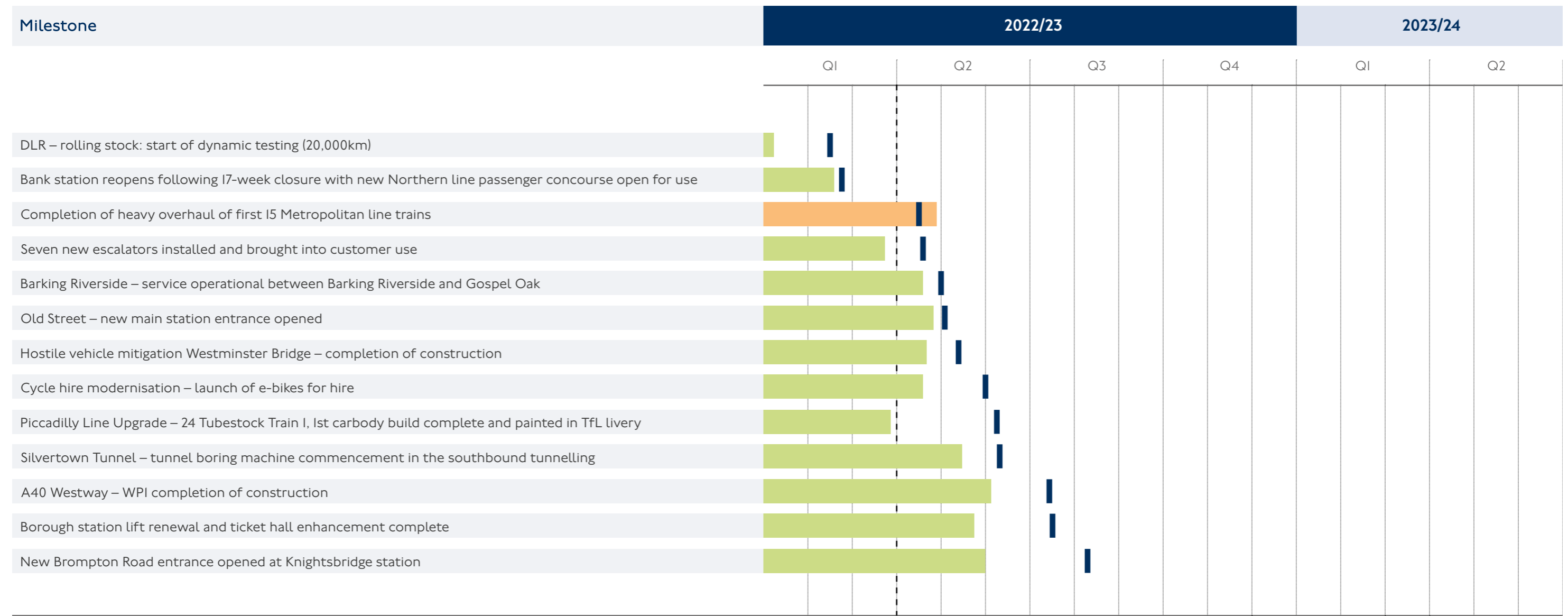
In April 2022, dynamic testing (20,000km) started on the new DLR rolling stock.



Strategic milestones

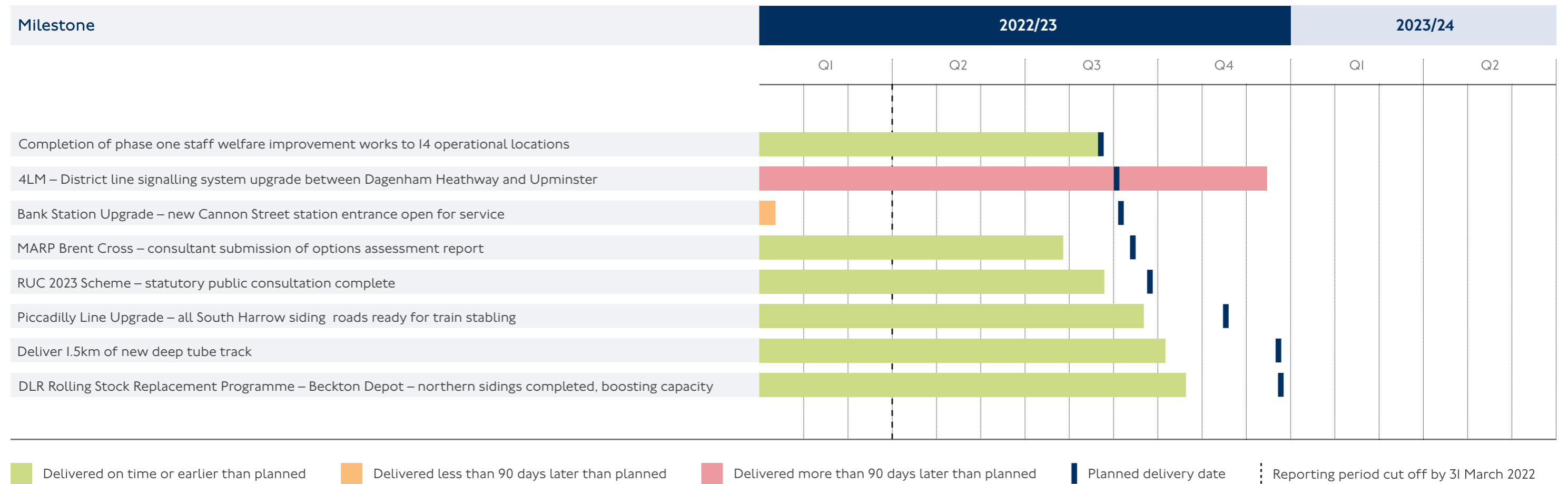
We have delivered 4 out of 21 strategic milestones either on time or early this year

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

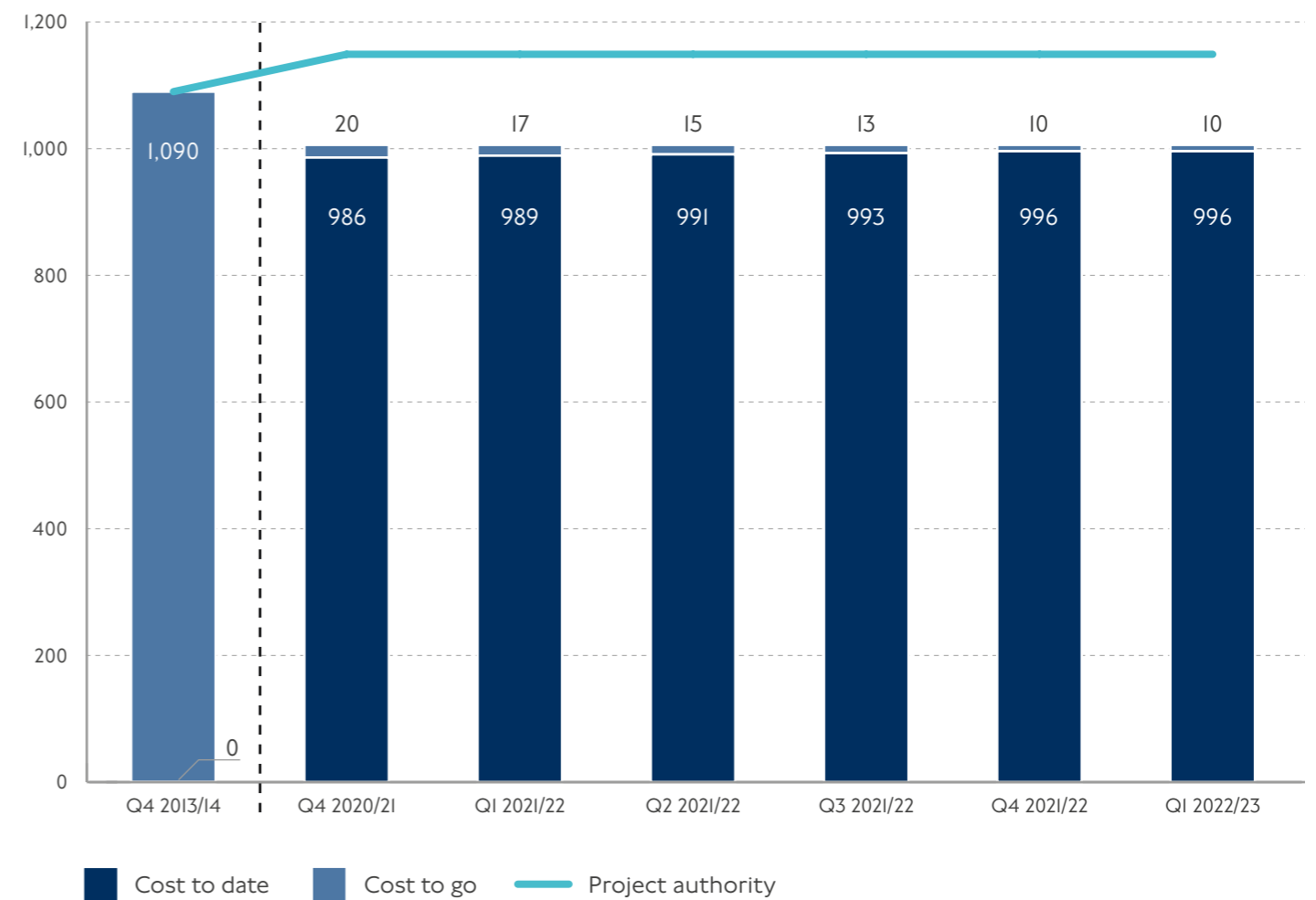
Passenger services between Reading and Paddington are operating with a combination of nine-car and seven-car Class 345 trains. The three remaining seven-car trains will continue to serve the shorter platforms at Paddington National Rail station until the start of through-running services into the Elizabeth 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

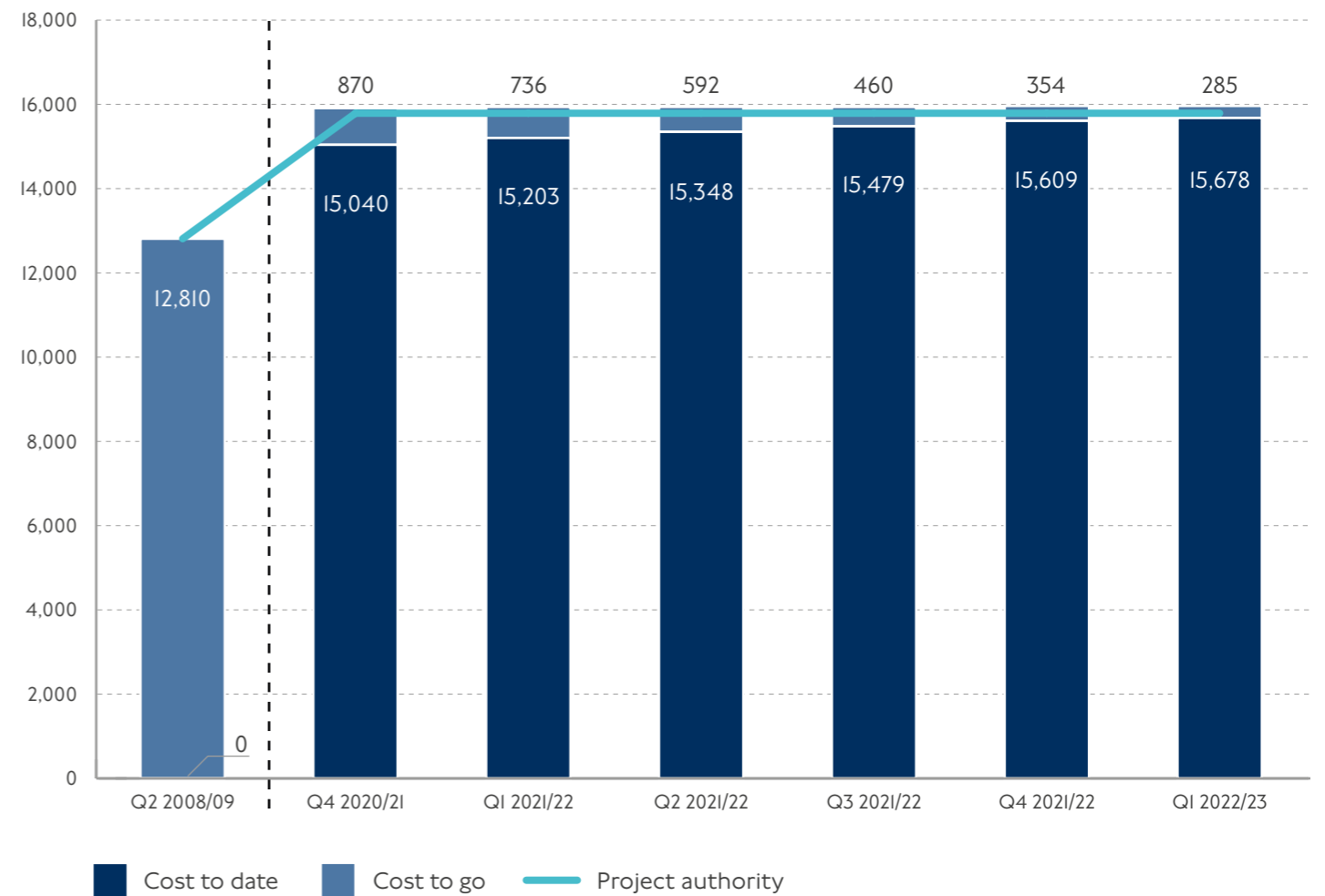
The reported forecast end date represents operation of a full service from Reading and Heathrow through the central section to Shenfield and Abbey Wood, with a peak service of 24 trains per hour on the central section between Paddington and Whitechapel.

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.

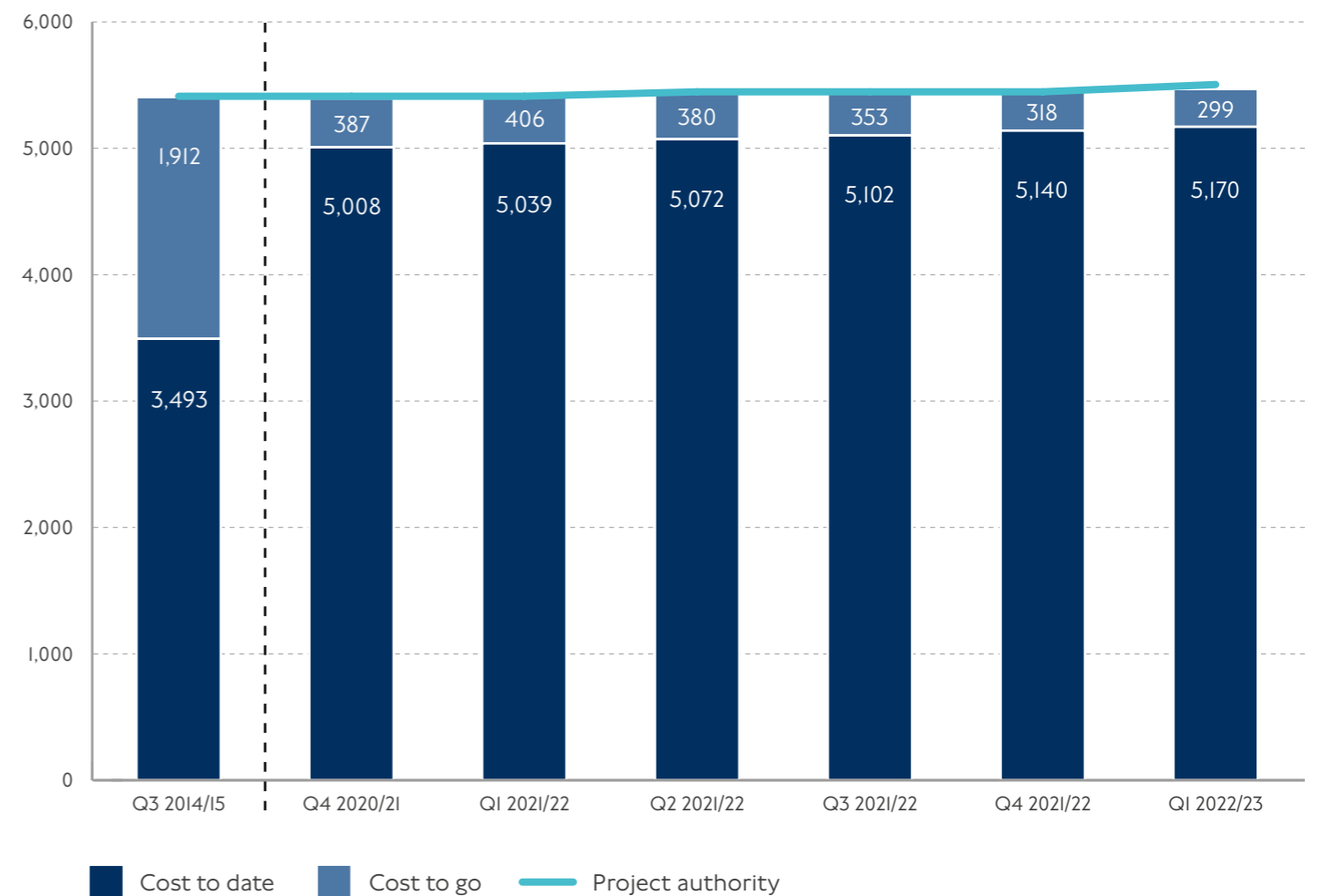
Since the award of the signalling contract in July 2015, our forecast completion date for SMAI4 has been delayed, and is now expected to be delivered in early 2025. The delays are principally due to challenges with complex software development, testing and commissioning, closure availability and the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





Page 45

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

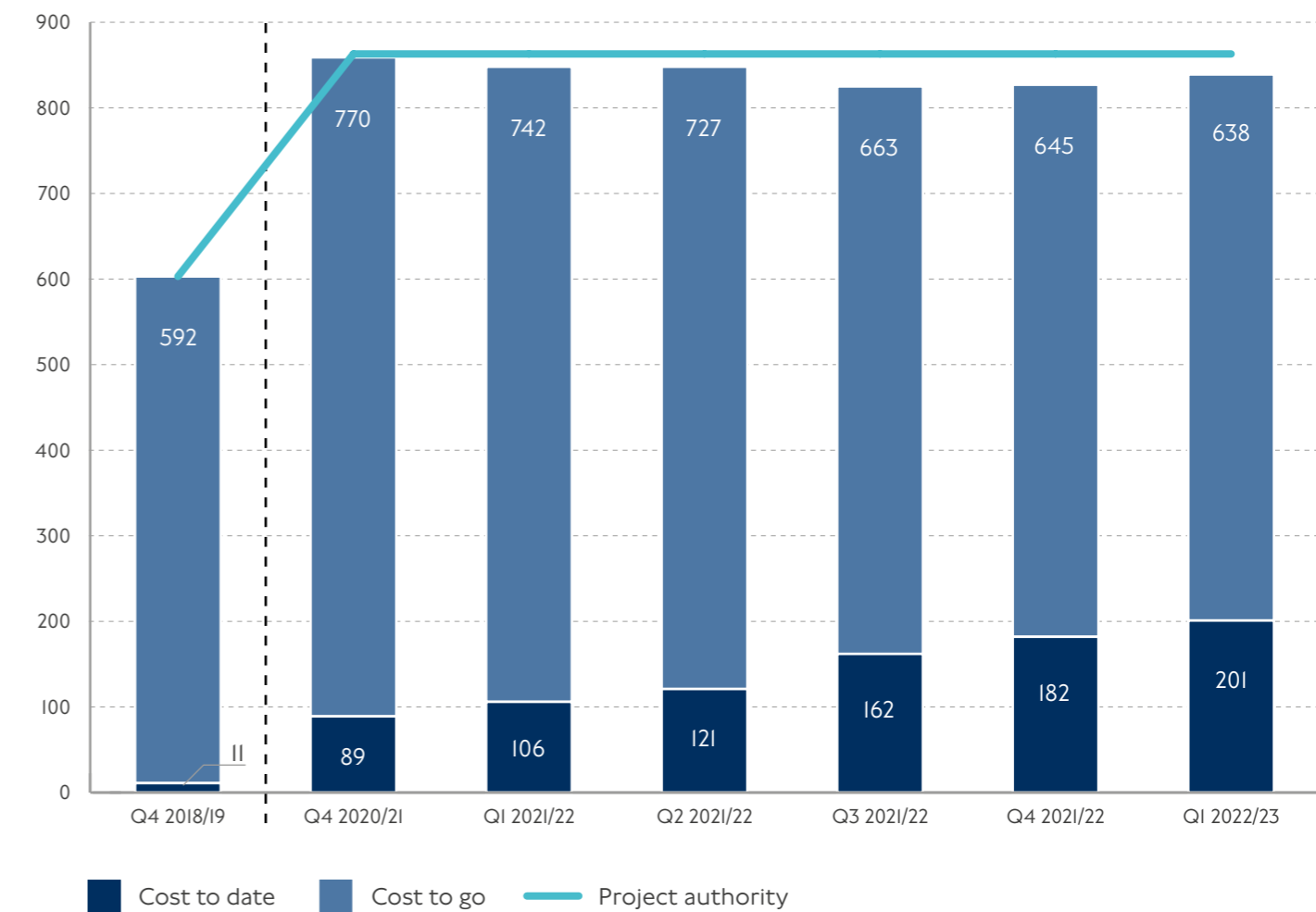
The forecast end date in the performance over time graph has not changed since the last report.

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.

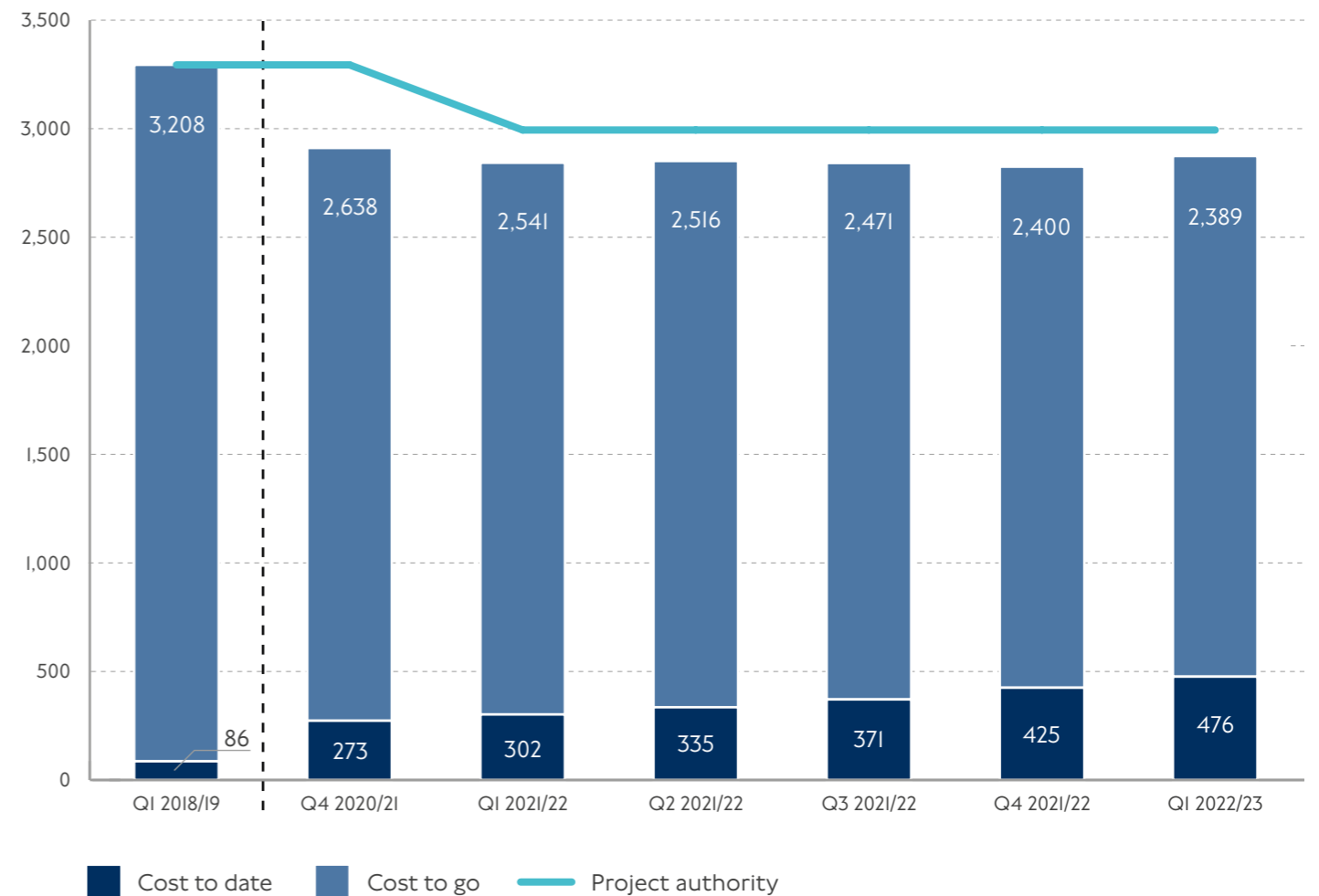
Performance over time

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





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

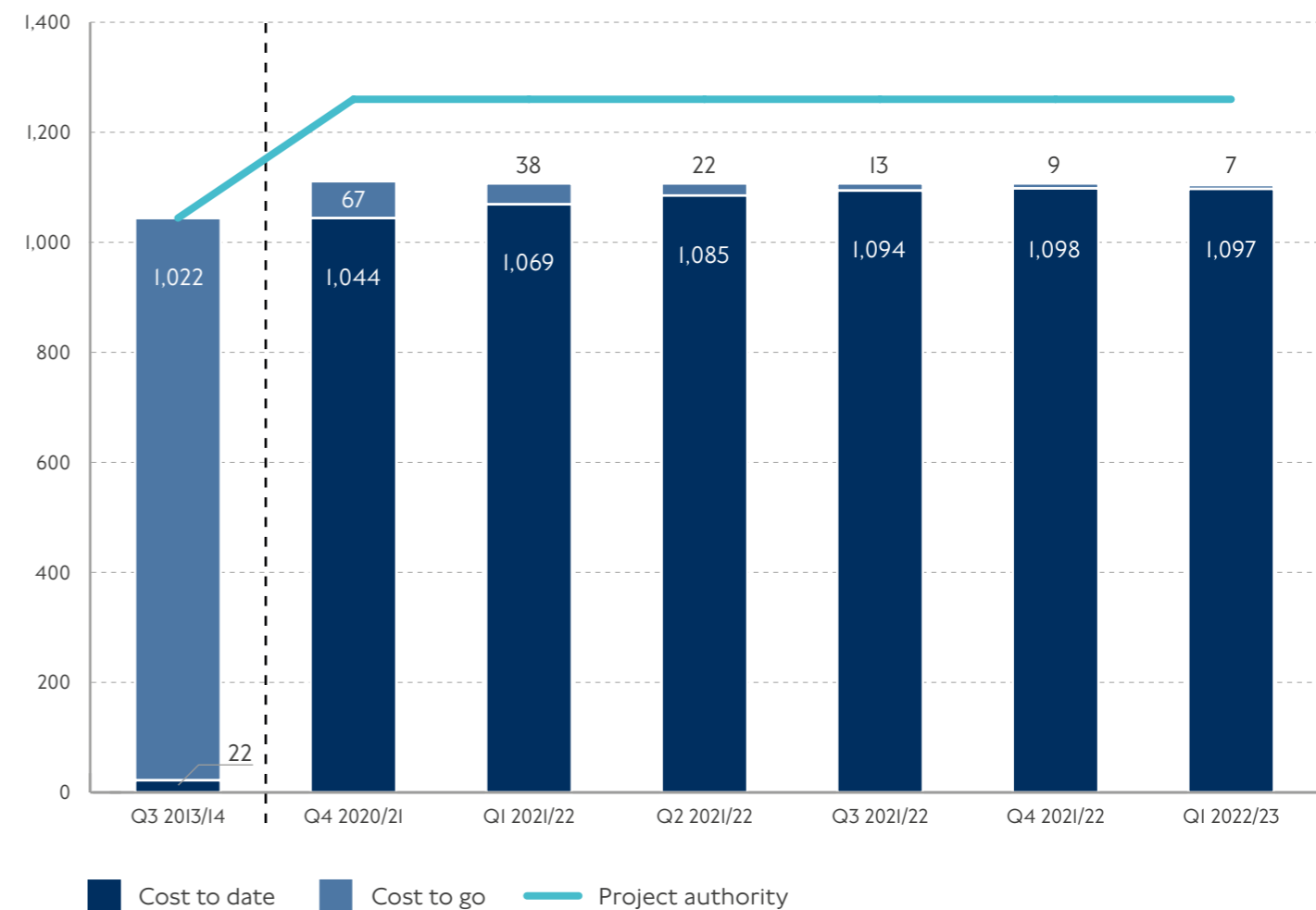
The project is expected to come in £153m under budget, bringing its EFC to £1.1bn, despite the cost pressures brought about by the pandemic.

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

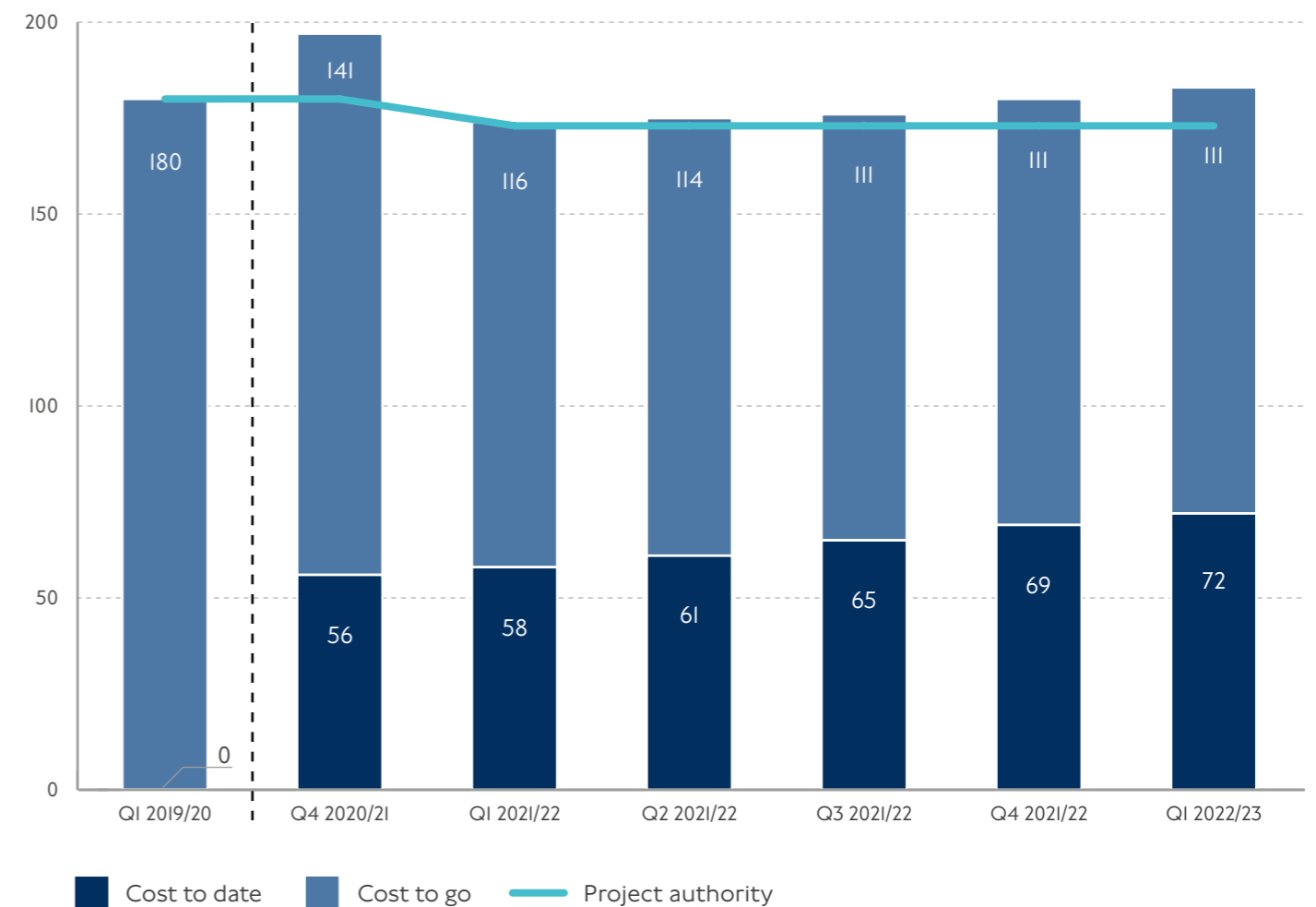
The forecast end date is when we obtain the permit from an independent assessor to use the new Silvertown Tunnel.

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

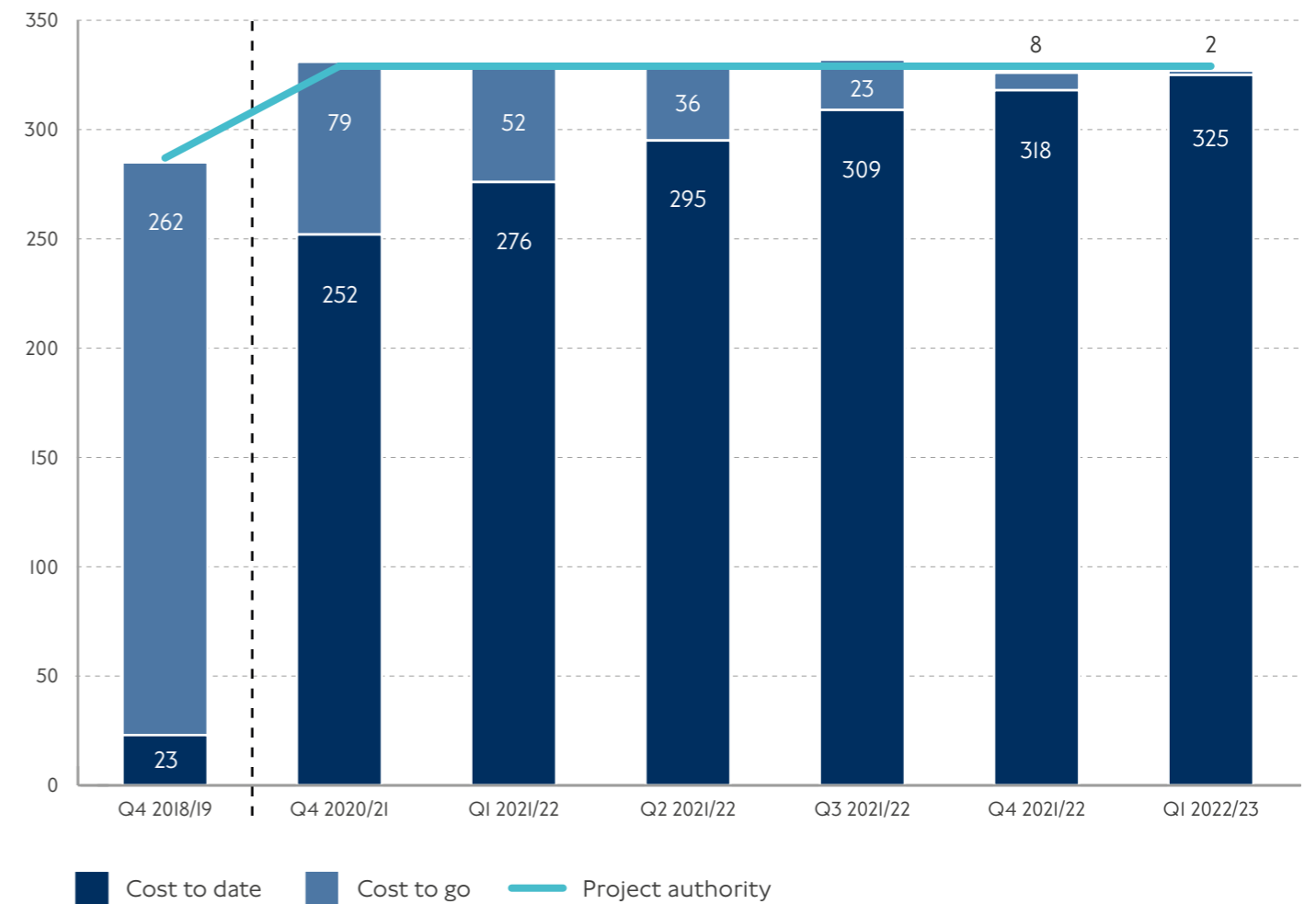
The EFC has increased by approximately £1m since the last report, due to additional work to resolve signal sighting issues and main works contract completion prolongation.

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





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

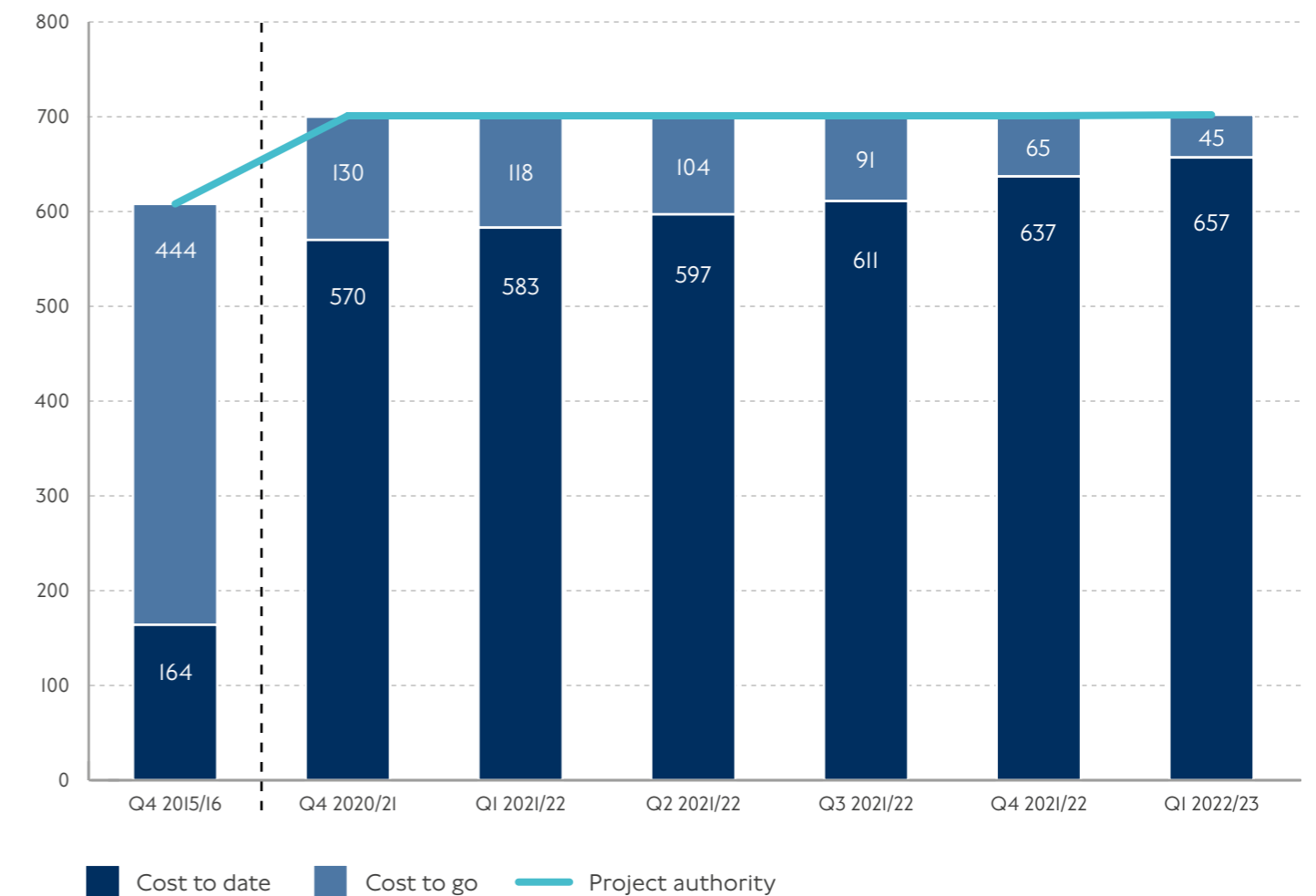
Following a 17-week planned closure, the Bank branch of the Northern line reopened on time on 16 May. During that closure, we constructed a new and wider southbound Northern line platform and spacious new customer concourse with three new passageways, which has made moving around the station quicker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

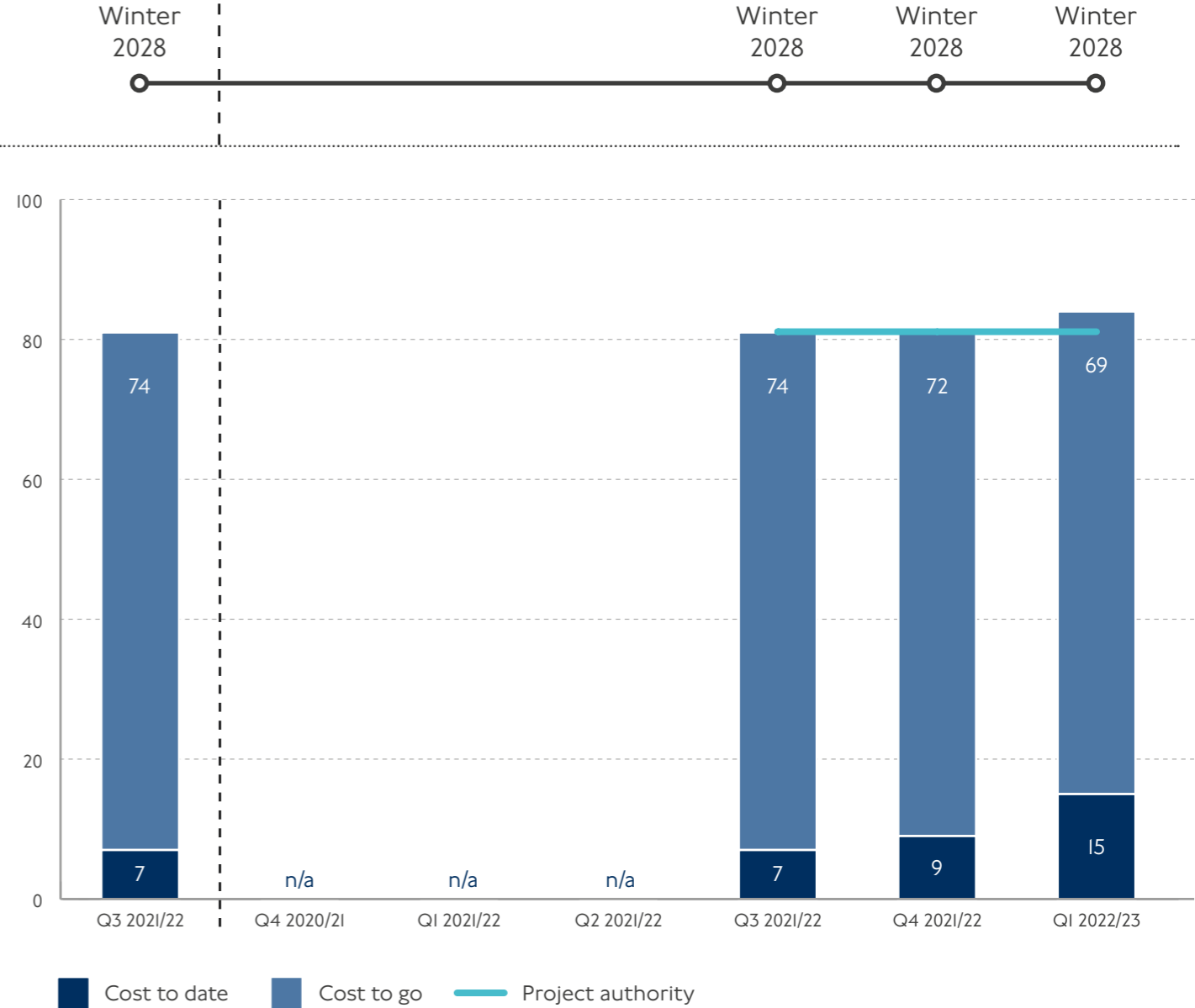
This increase in inflation has not been applied to the cost of the station box being constructed for TfL by the developer, as this is a fixed-price contract enshrined within the development agreement of December 2021. The team continues to work to develop its understanding of the project risks, and actively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

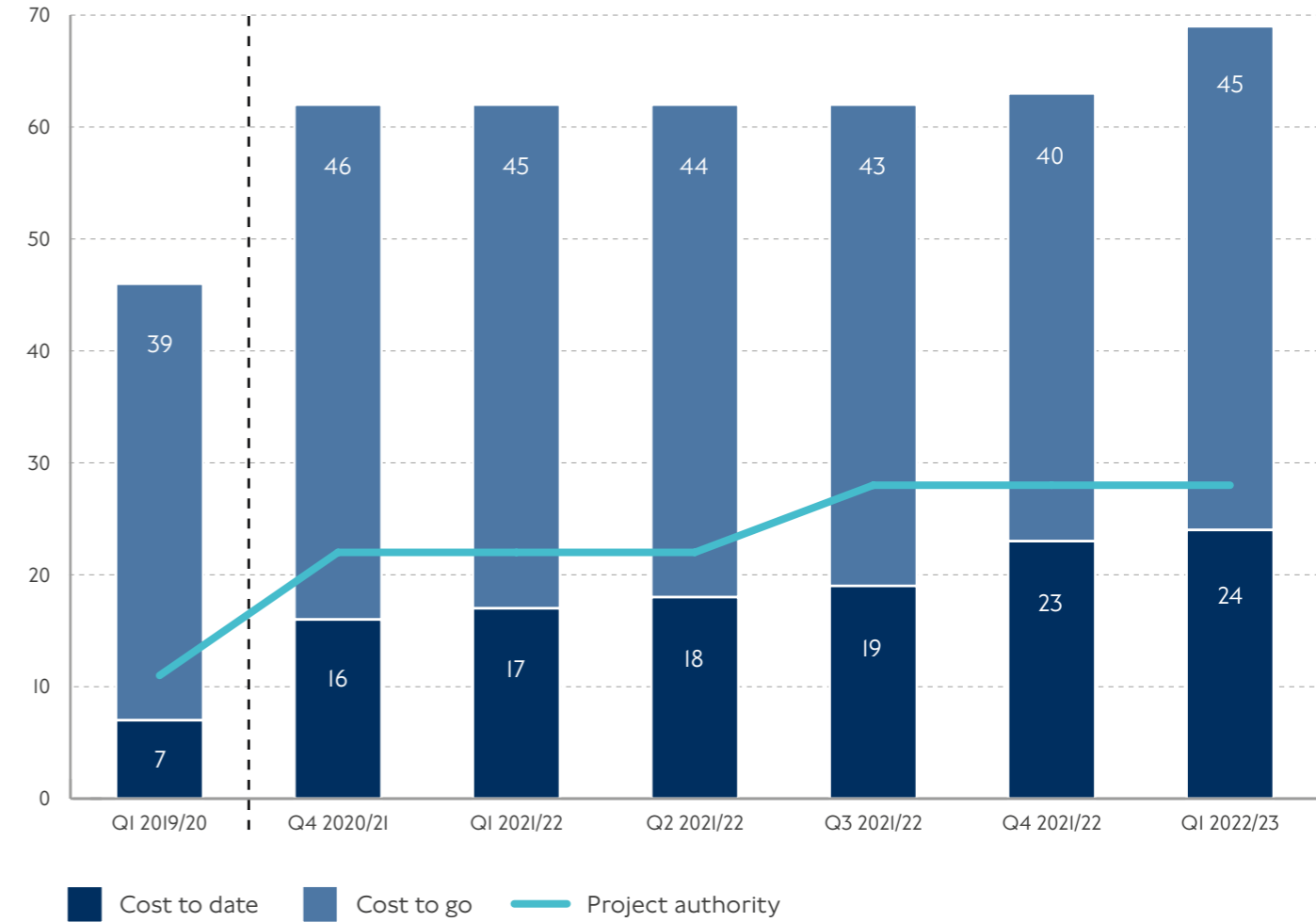
Performance over time

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

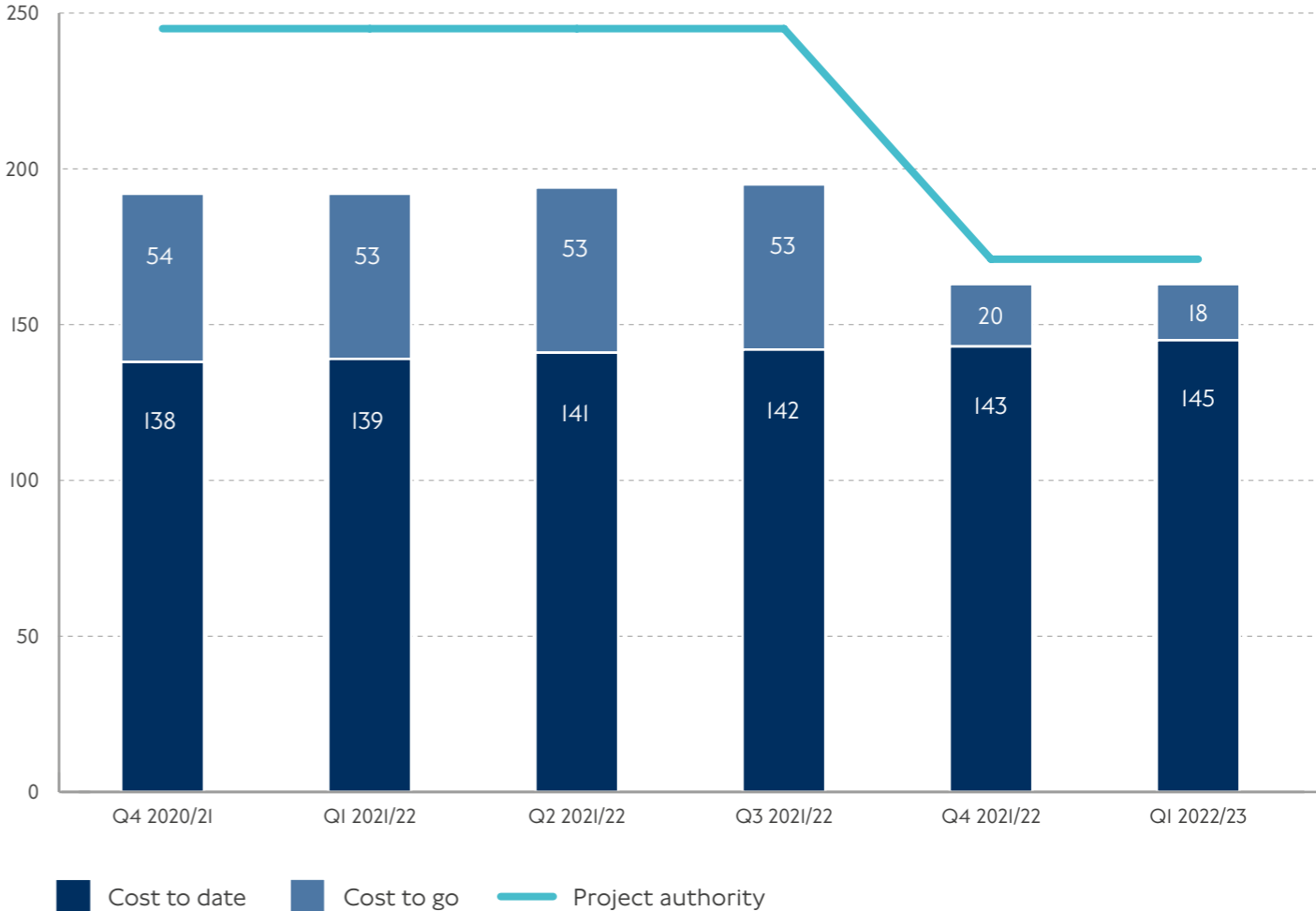
Delivery of the final scheduled Northern line signalling software updates continues, with the first release targeted for commissioning on the railway in late 2022 and the last in mid-2023. These software updates address residual issues and requirements following completion of the Northern Line Extension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

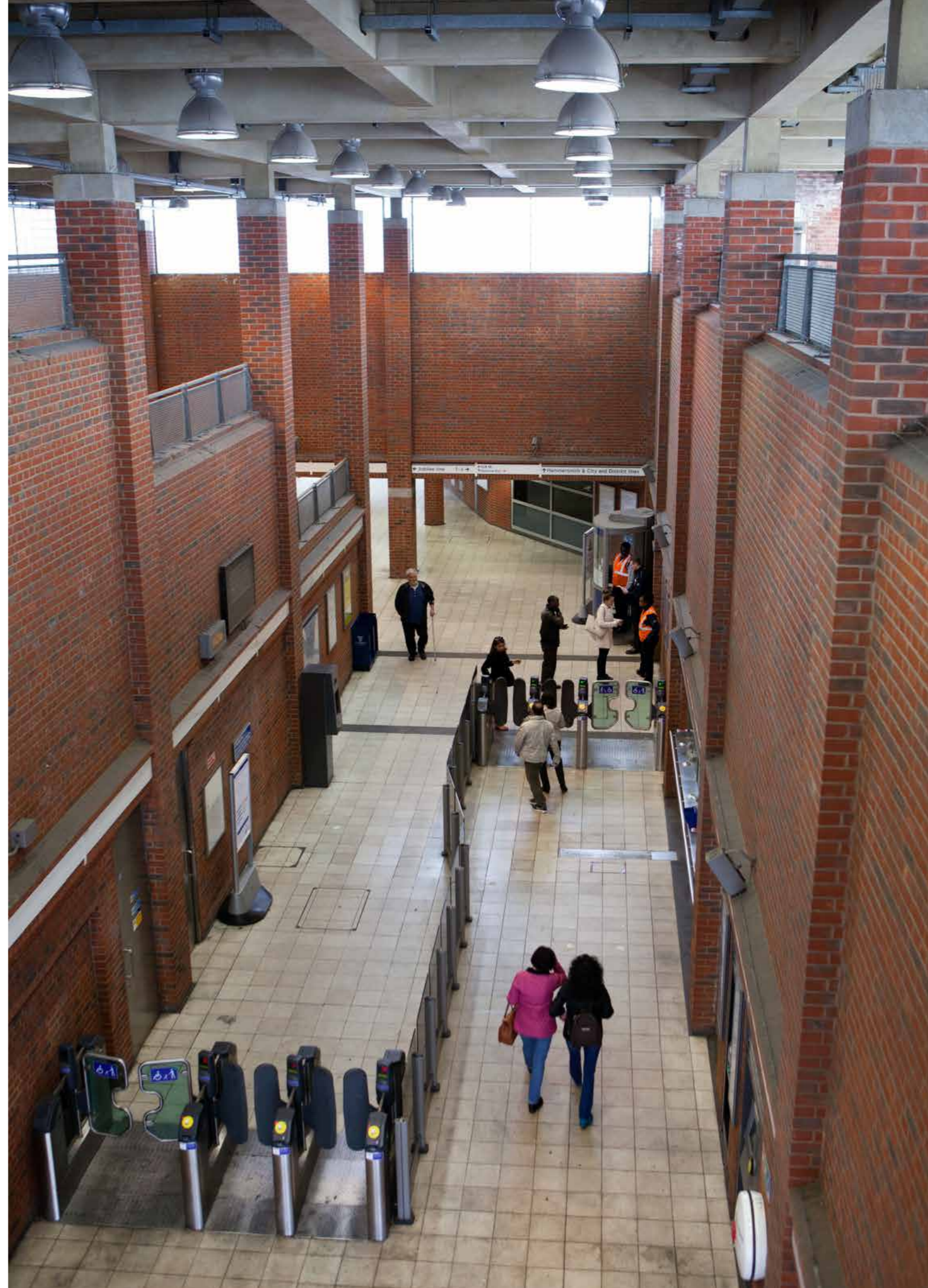
As part of a wider redevelopment at Waterloo that will see Elizabeth House demolished, we are developing a project to provide step-free access to the Northern line platforms. Discussions with the developer are ongoing and the programme is yet to be confirmed. The lift shaft would be constructed by the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



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

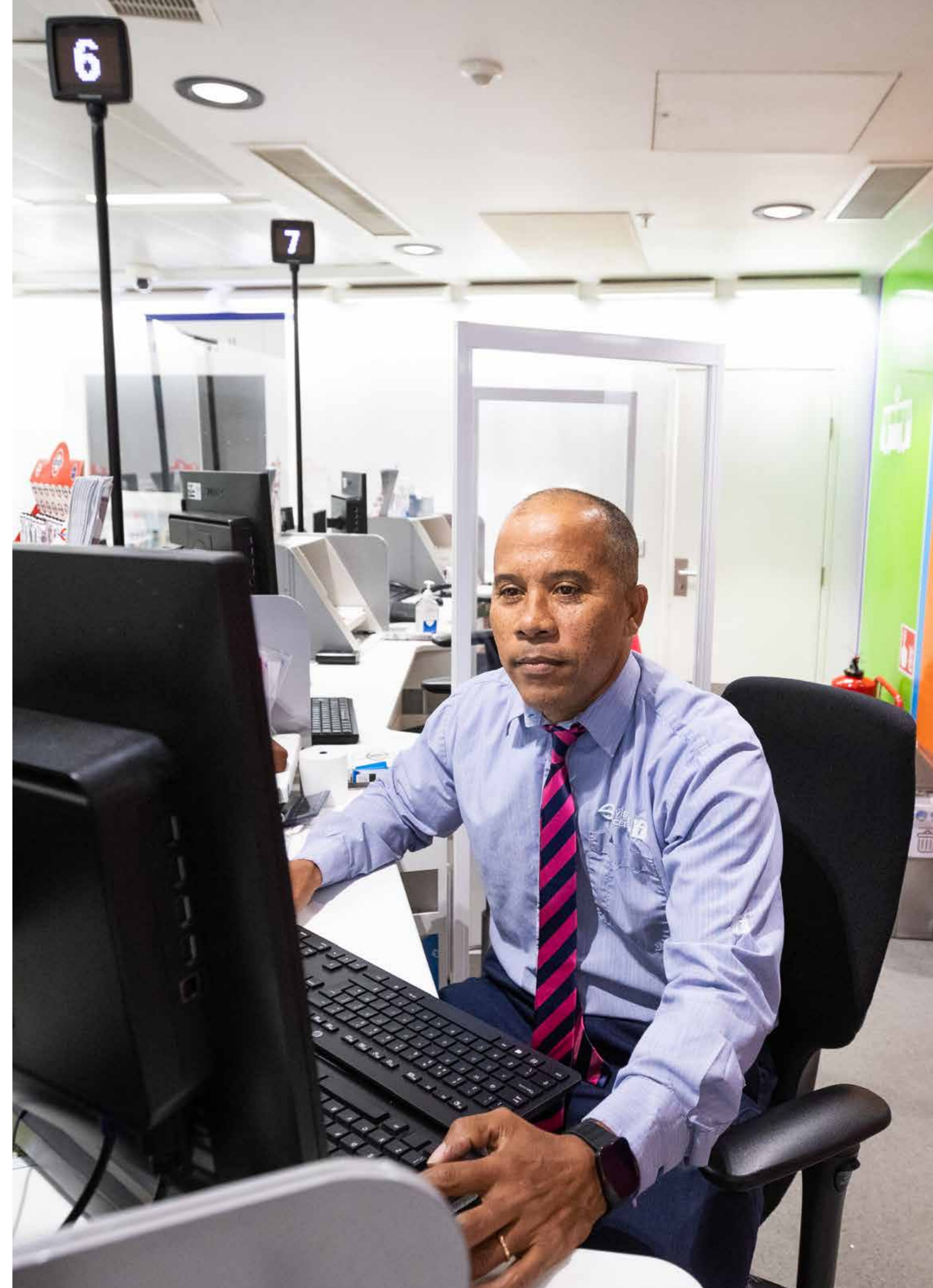
We have completed concept and detailed designs to replace station information management systems, public address and voice alarm systems, as well as the passenger Help Point systems, at eight stations on the extension section of the Jubilee line. Two stations have started on site (London Bridge and North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

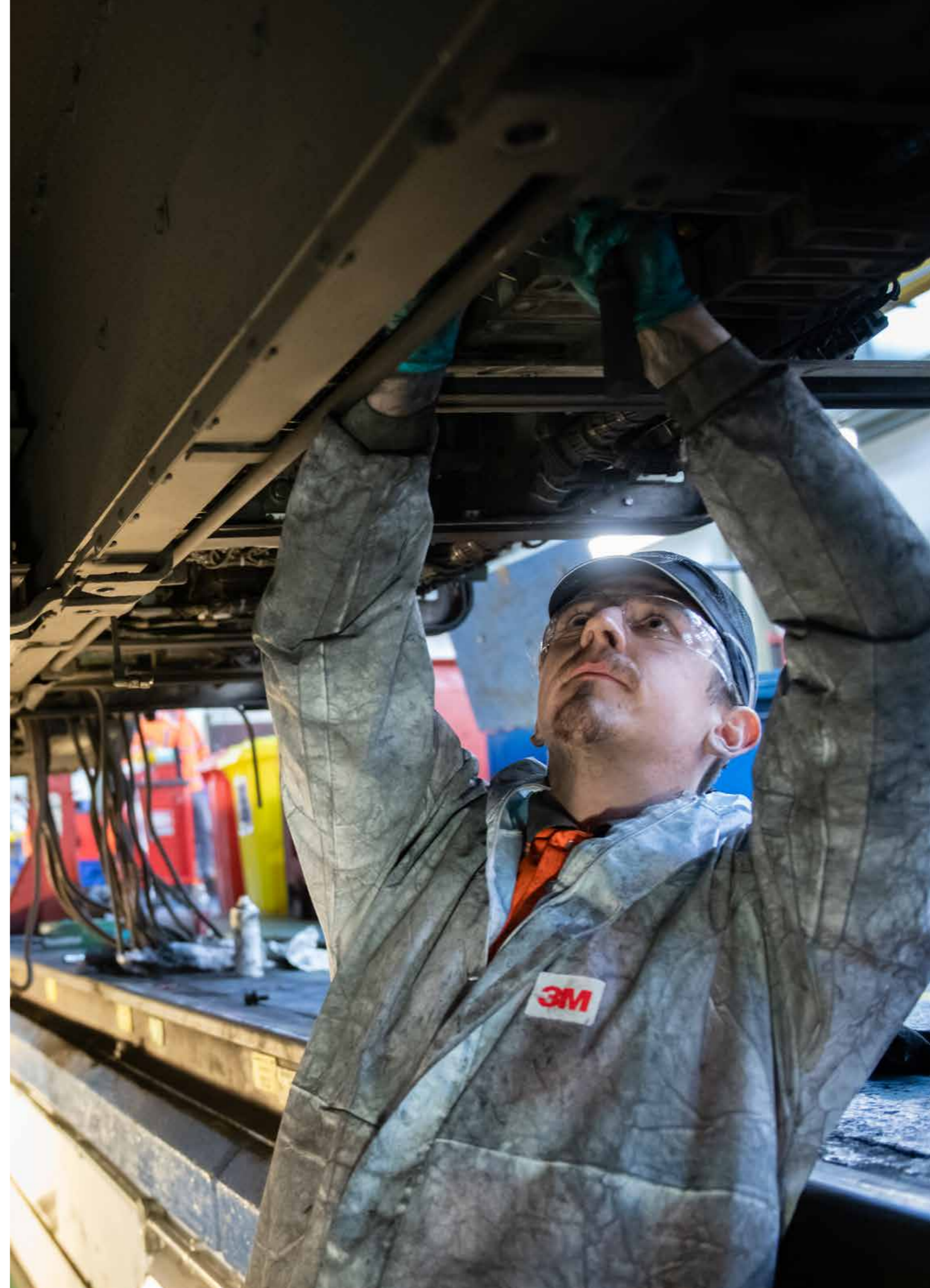
We are purchasing a new fleet of engineering wagons from the world's largest rolling stock manufacturer. The five wagons so far delivered to the UK have completed static testing with dynamic testing now underway. The wagons have successfully passed bogies frame testing and the manufacturer is preparing 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



Page 70

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.

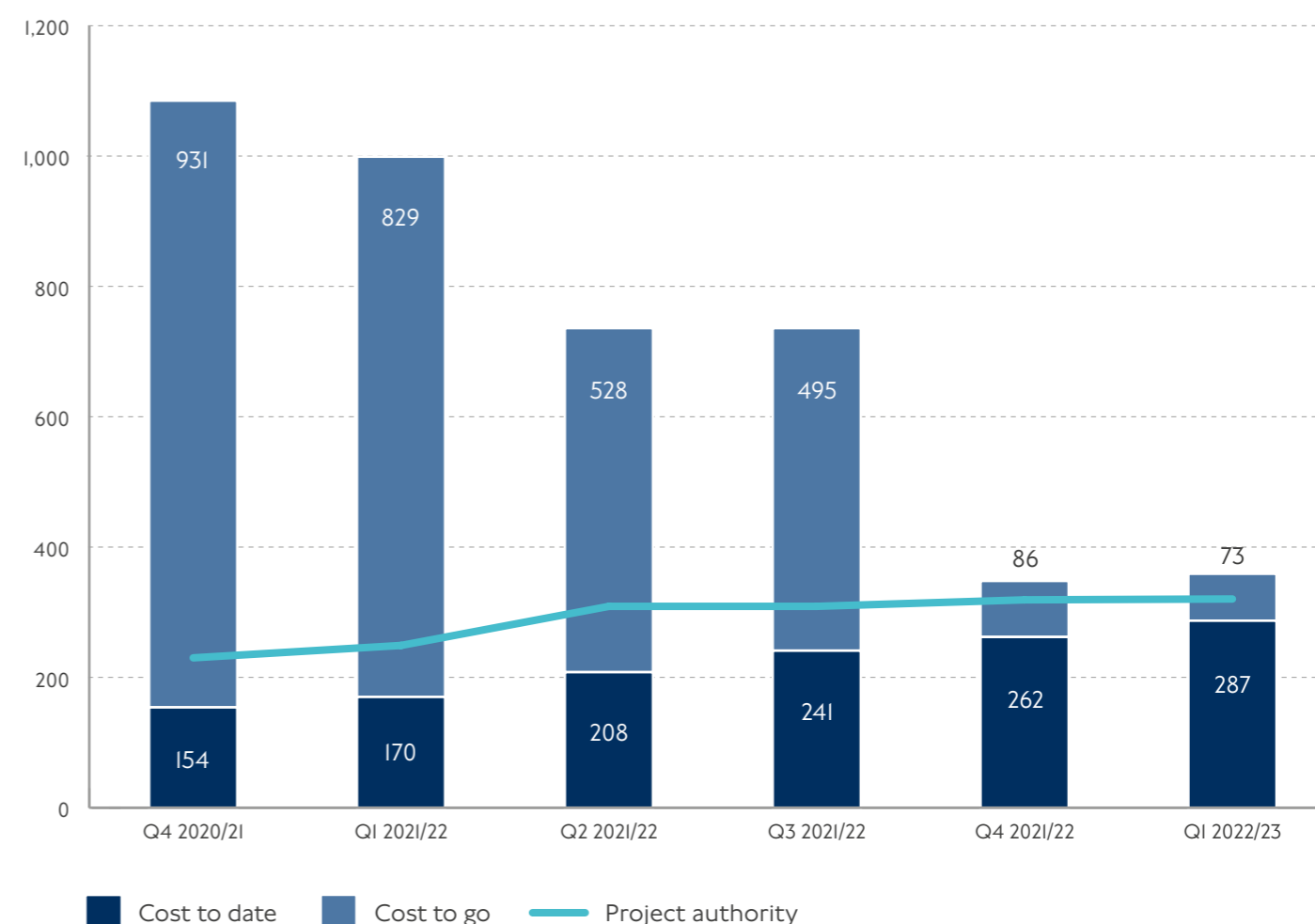
Continued investment in active travel will need to form part of a longer-term, sustainable capital funding deal with the Government. The cost forecasted to 2024/25 in this report reflects the managed decline scenario and is in line with our assumptions made in the recent TfL budget.

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.

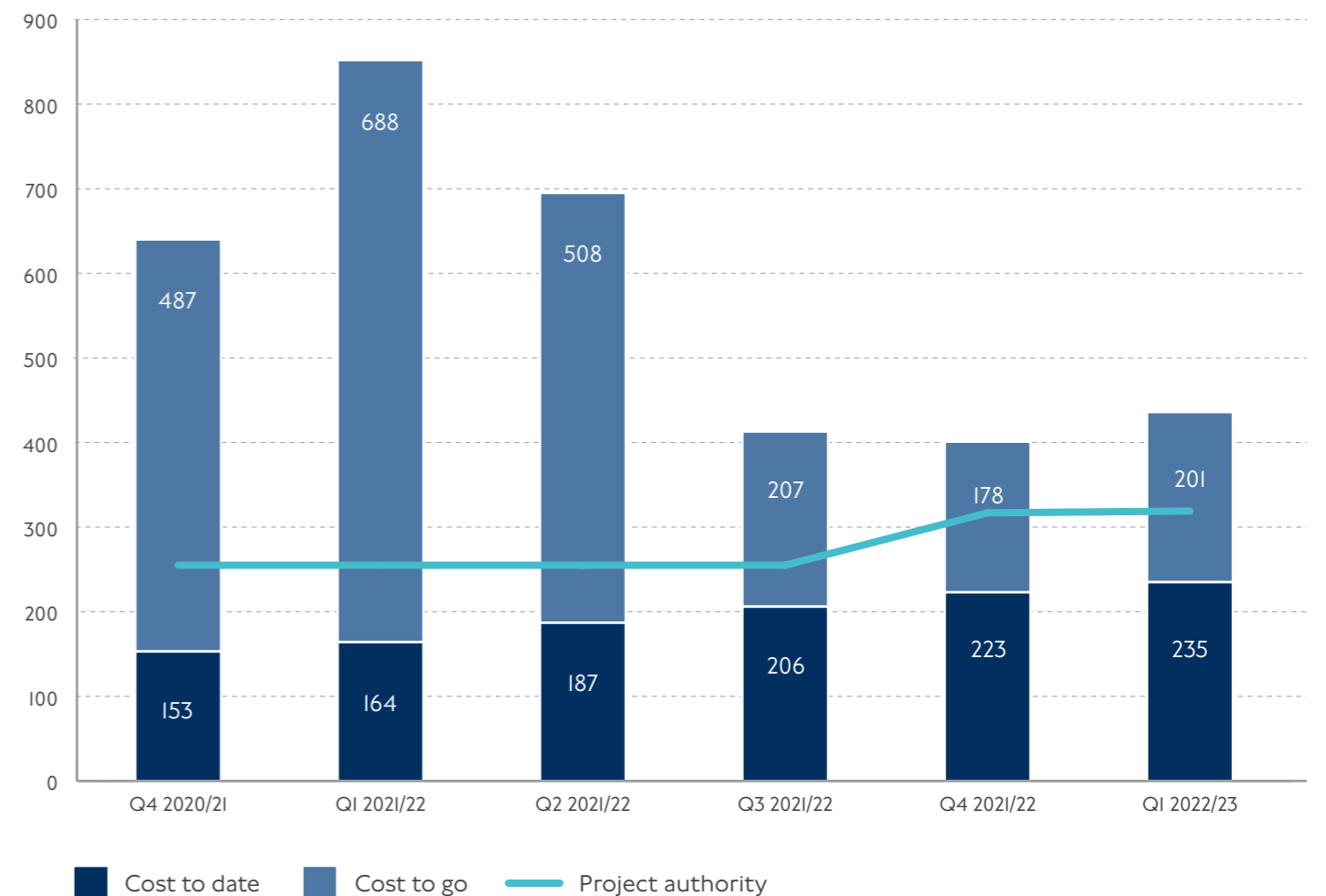
This delivery approach is necessary to ensure coordination and integration with other key Road User Charging schemes, including Tunnel User Charging and the re-let of contracts.

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.

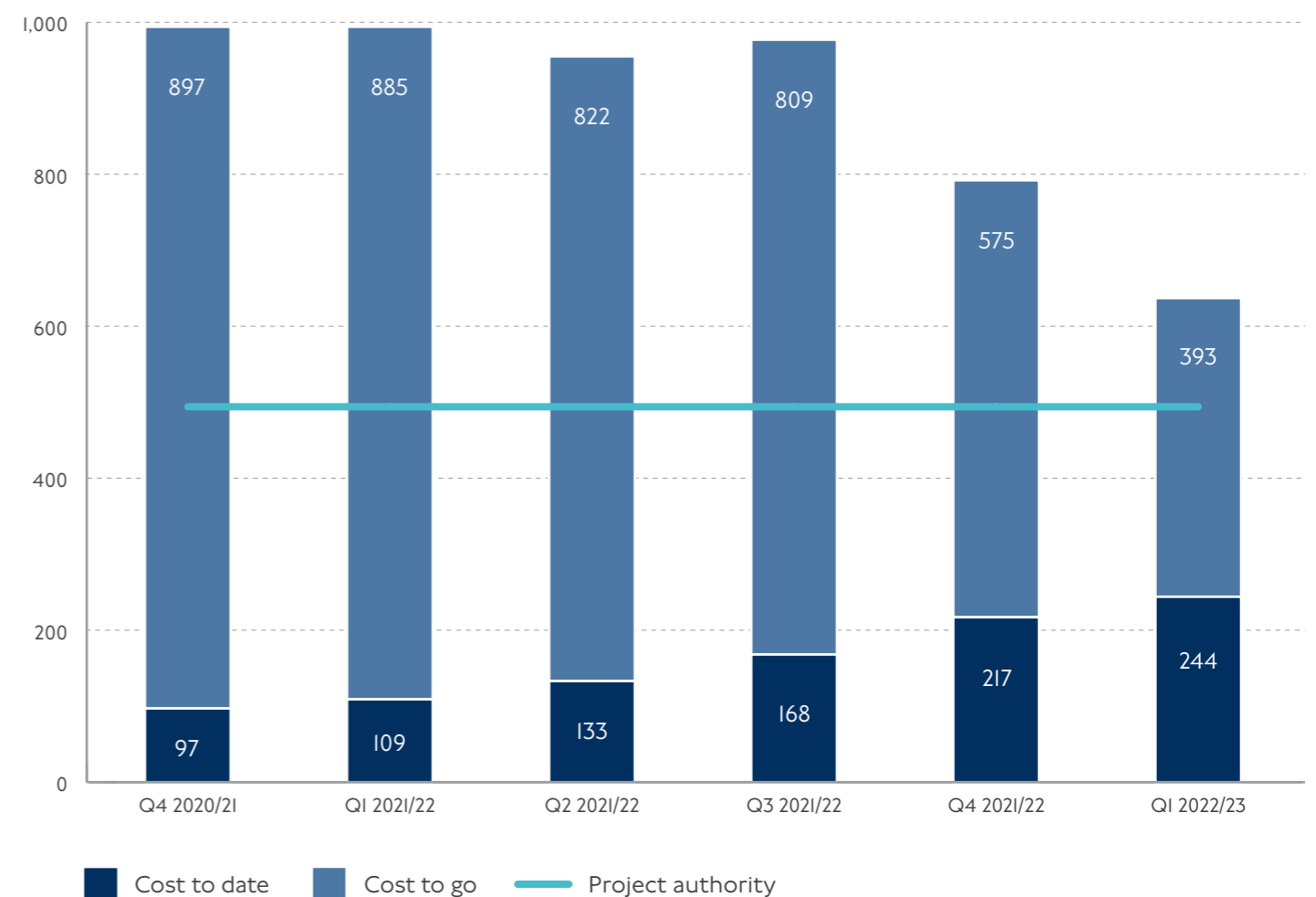
Also, the Asset investment portfolio has delivered more than £3m of cost reductions thus far this financial year: project teams found more efficient ways of working and gained increased value for money from suppliers. This represents an improvement on the savings found at this same stage of the previous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

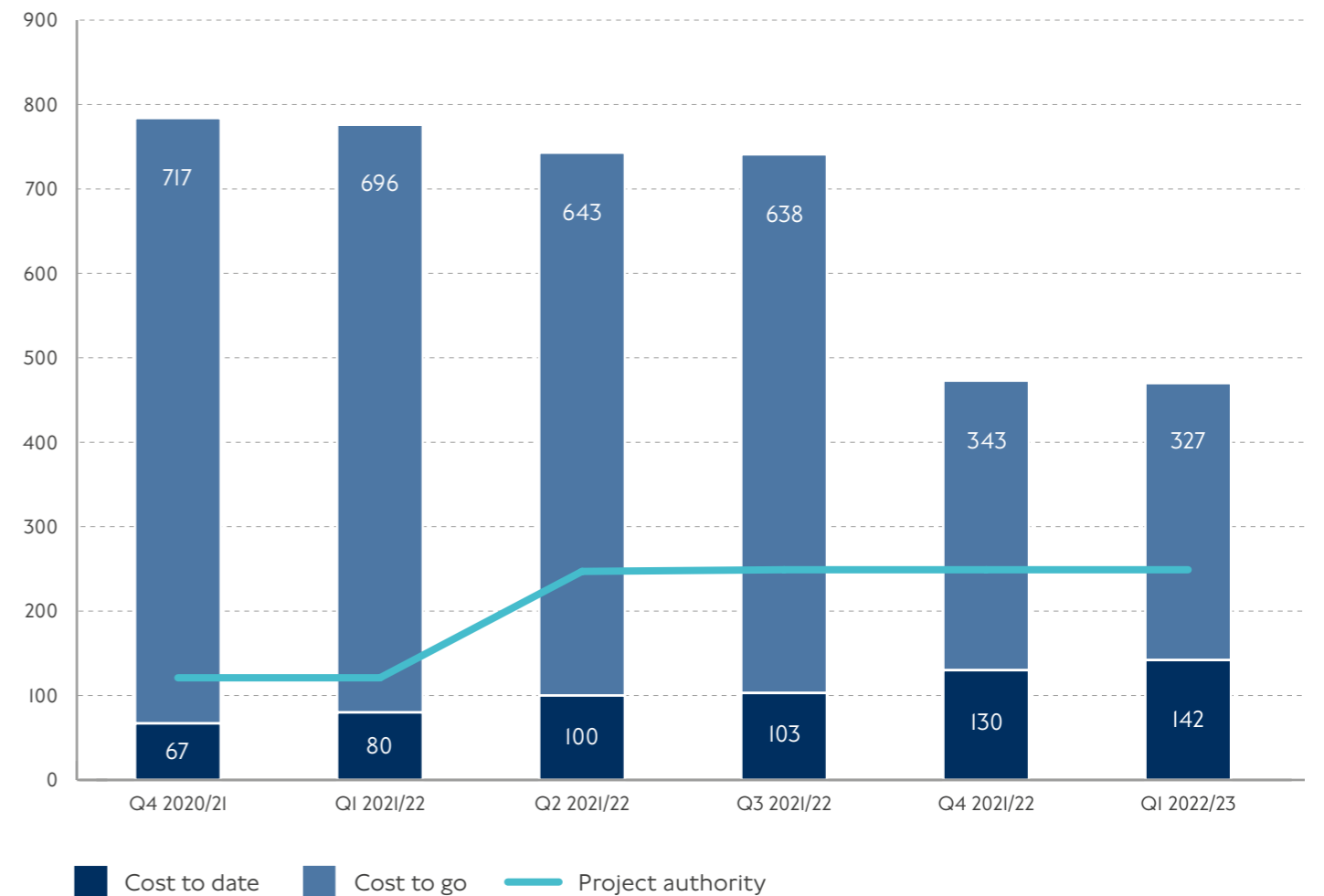
The latest forecast continues to reflect the prioritised renewals assets programme, following the impacts of moving to the managed decline scenario. The New Routemaster refurbishment project, which provides mid-life refurbishment for 1000 buses, forecasted the re-profile of delivery spread into later 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.

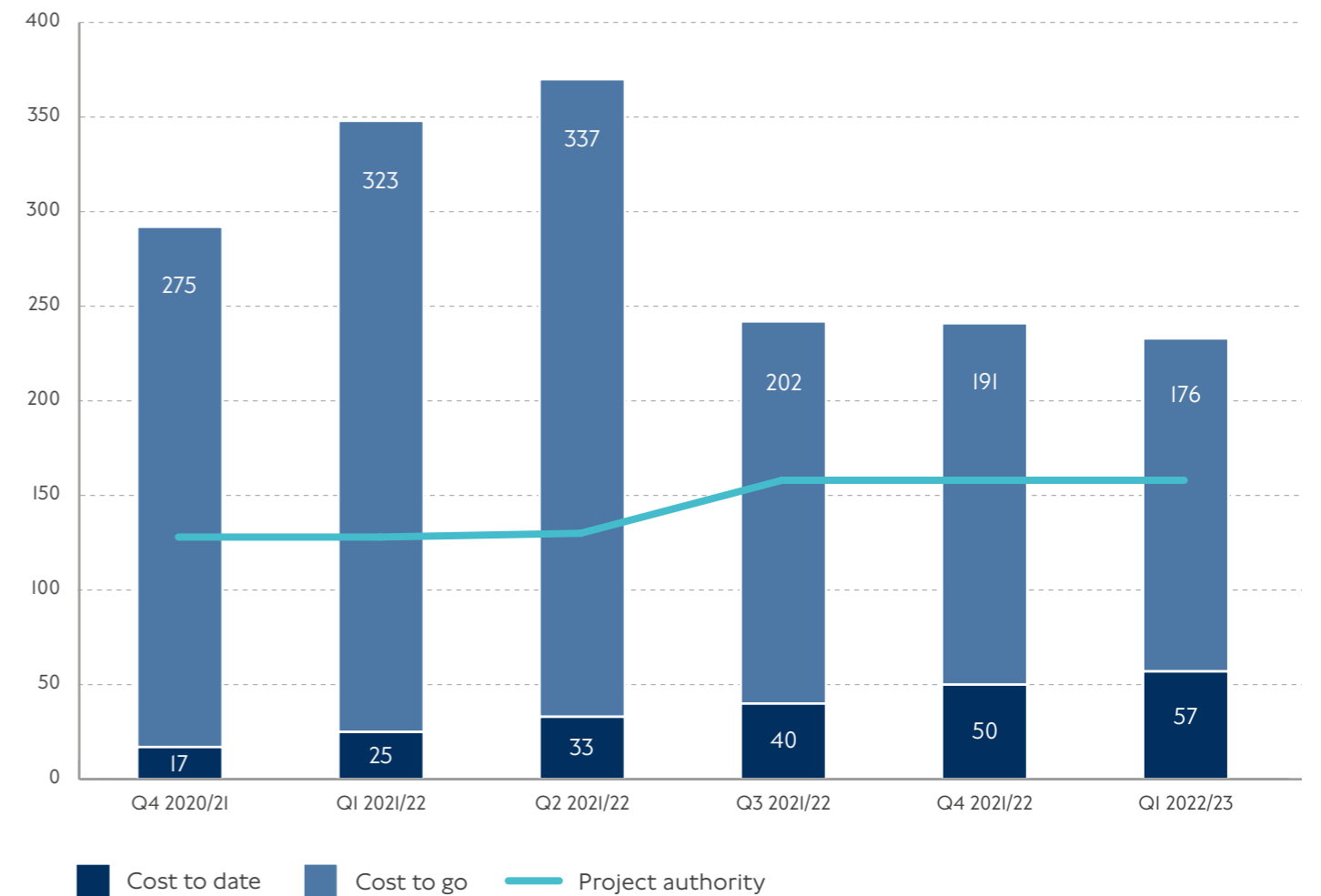
Performance over time

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

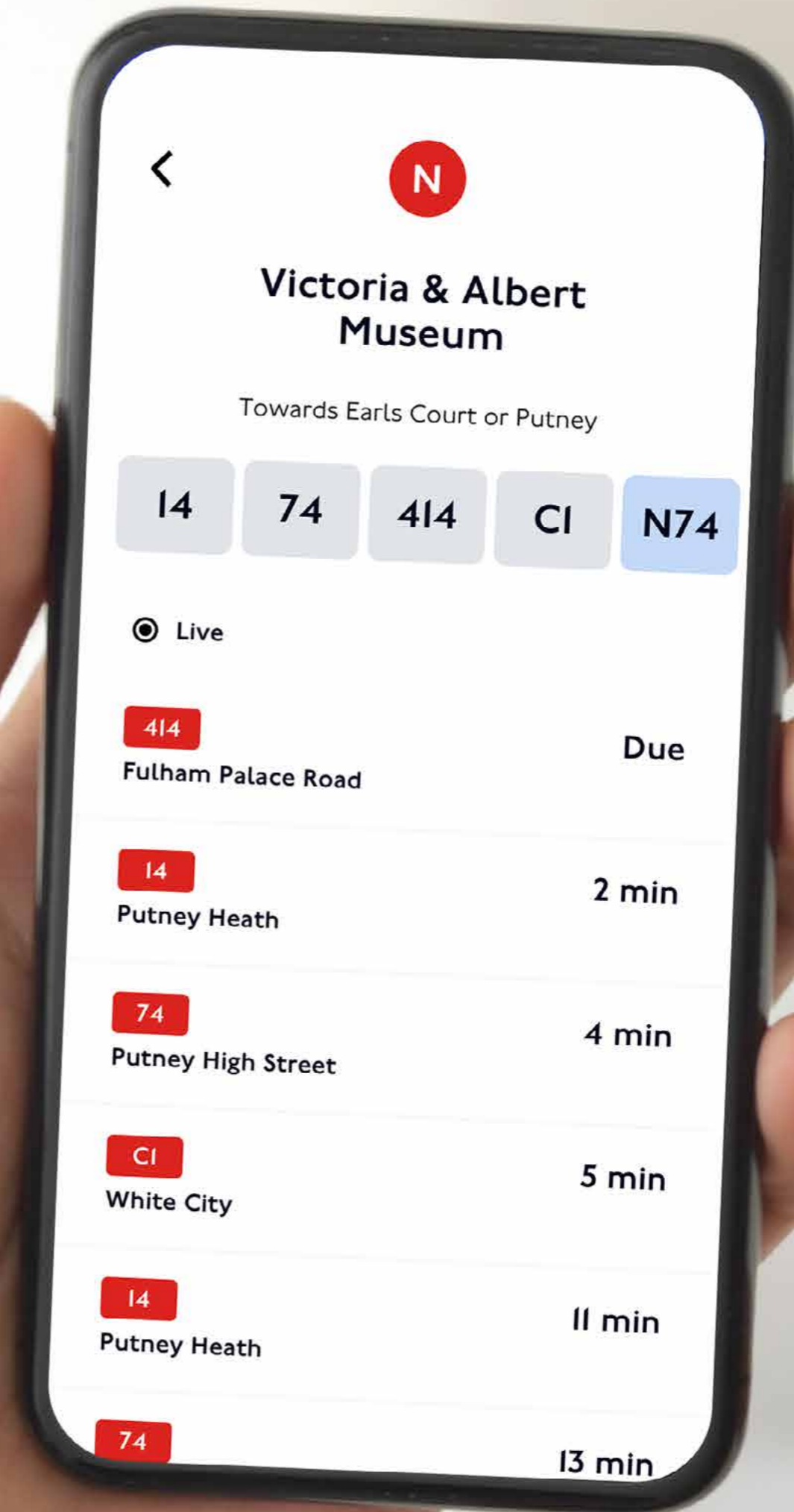
We are maintaining and developing technology to operate our public transport networks and improve customer experience. This includes upgrading the critical technology that underpins the bus network, such as the iBus system, which provides real-time information on bus locations. The tender process to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

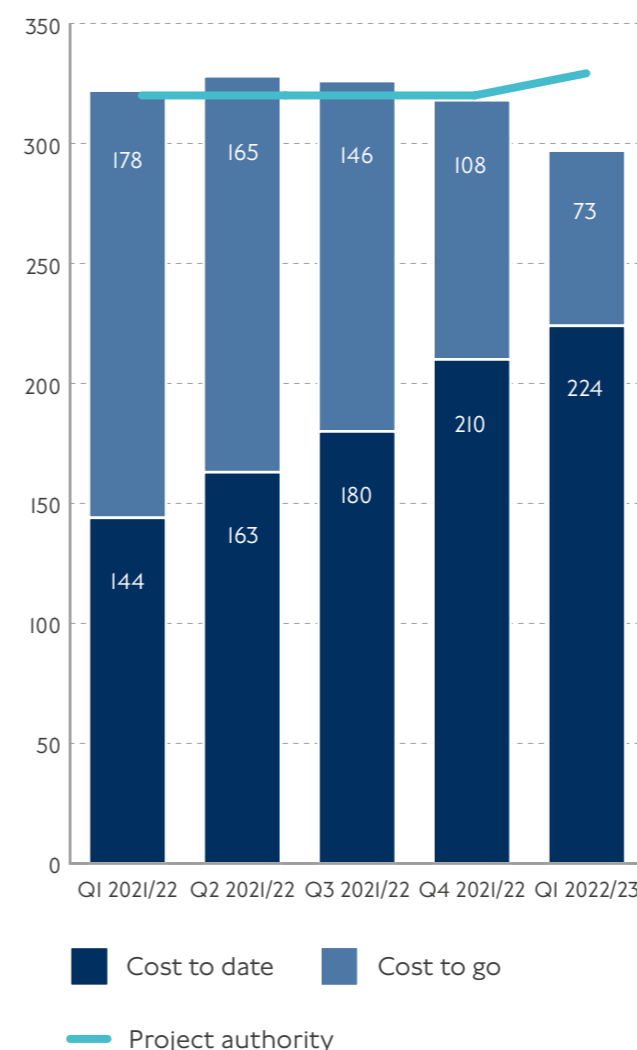
Payments

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.

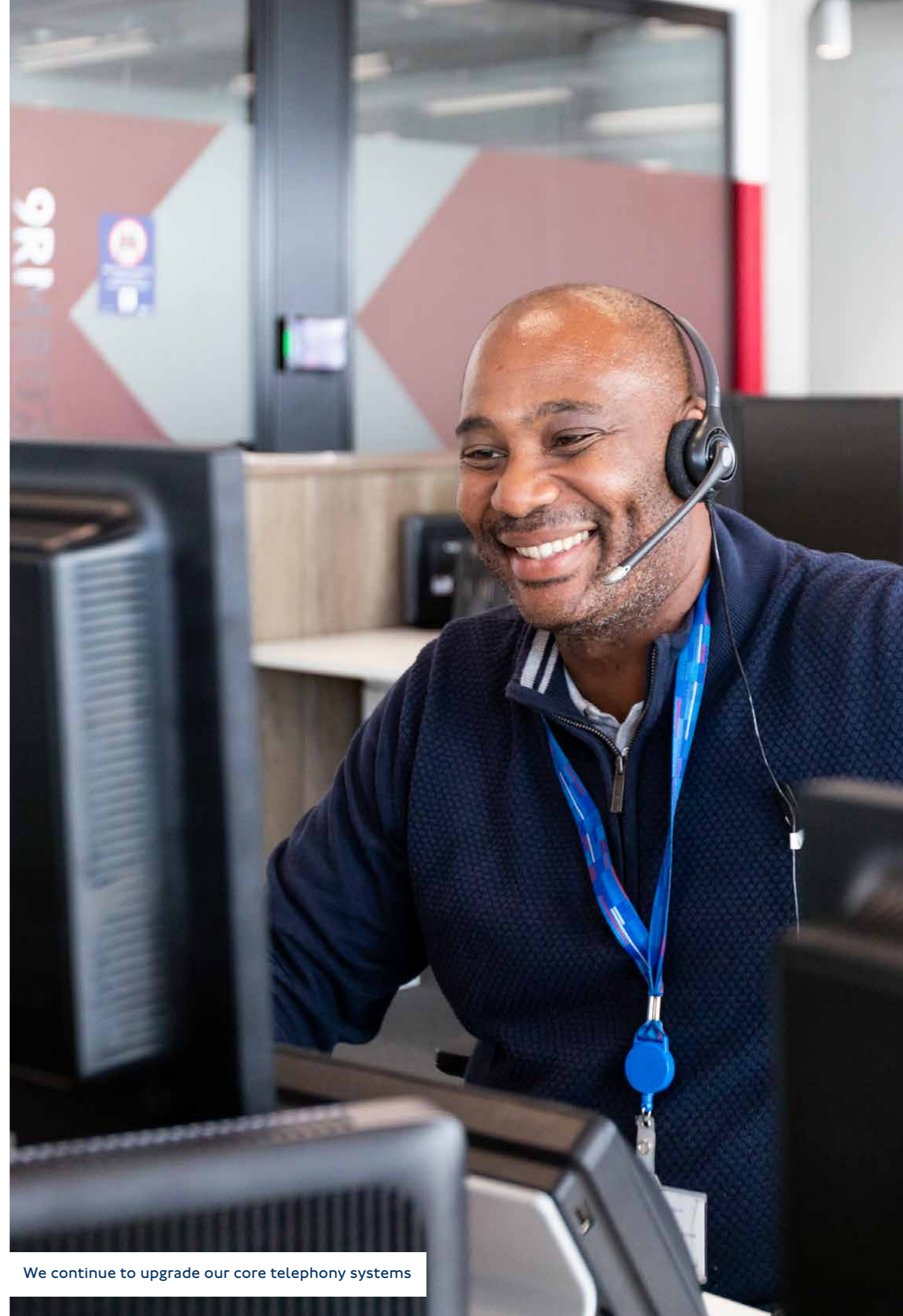
We have completed the third phase of our meeting rooms' upgrade project, which has provided 50 operational locations with Microsoft Teams video conferencing equipment. We have also agreed a project-managed model for continuing to deliver smart meeting rooms where there is business demand. This ongoing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

Page 93

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.

[page left intentionally blank]

Programmes and Investment Committee



Date: 19 October 2022

Item: Independent Investment Programme Advisory Group
Quarterly Report

This paper will be considered in public

1 Summary

- 1.1. This paper presents the Independent Investment Programme Advisory Group (IIPAG) quarterly report for October 2022. It describes the work undertaken since the last report presented to the Committee in July 2022.
- 1.2. A paper is included on Part 2 of the agenda which contains exempt supplemental information that is exempt from publication by virtue of paragraph 3 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the business affairs of TfL. Any discussion of that exempt information must take place after the press and public have been excluded from this meeting.

2 Recommendation

- 2.1 **The Committee is asked to note the Independent Investment Programme Advisory Group's quarterly report, the management response set out below and the exempt supplementary information on Part 2 of the agenda.**

3 IIPAG Quarterly Report

- 3.1 Under its Terms of Reference, IIPAG is required to produce quarterly reports of its advice on strategic and systemic issues, logs of progress on actions and recommendations and the effectiveness of the first and second lines of project and programme assurance. IIPAG's quarterly report for October 2022 is included as Appendix 1 to this paper.

4 Management Response to IIPAG Quarterly Report

Resource Shortages

- 4.1 The recommendation by IIPAG is accepted and will be addressed through inclusion in workstream which is being overseen by the Chief Capital Officer.
- 4.2 With the recent confirmation of funding levels for the Capital Programme it is now possible to develop a clear view over the extent of resource need. Regular meetings are in place with senior leaders to challenge, review and find solutions to resource gaps (e.g. fortnightly in Delivery, bi-weekly in Engineering). Project priorities are always discussed and we will advise at these meetings of the recommendation to directly compare this data.

List of appendices to this report:

Appendix 1: Independent Investment Programme Advisory Group - Quarterly Report
October 2022

Exempt supplementary information is included in a paper on Part 2 of the agenda.

List of Background Papers:

None

Contact Officer: Howard Carter, General Counsel
Email: HowardCarter@TfL.gov.uk

Independent Investment Programme Advisory Group – Quarterly Report October 2022

1. Introduction

- 1.1. This report to the Committee describes IIPAG's activities in August 2022 to September 2022. We have made a new strategic recommendation, concerning a review of resource allocation.

2. IIPAG Activity

- 2.1. We have undertaken the following sub-programme and project reviews in preparation for the Committee meeting in October:

- Elephant and Castle Station
- Train Systems
- LU Track and Drainage
- LU Fleet
- Piccadilly Line Upgrade (PLU)
- Docklands Light Railway (DLR) Rolling Stock Programme

- 2.2. We also undertook reviews for projects which are being considered through Executive governance, including Blackwall Tunnel refurbishment and Hina, the new reader. The accompanying paper from Project Assurance (PA) describes management progress in implementing IIPAG's recommendations from sub-programme and project reviews.

3. Systemic Issues

- 3.1. We have set out in previous IIPAG reports the common themes that emerge from sub-programme and project reviews, but currently there is a particular issue which has come up as an area of risk – resources.
- 3.2. Shortage of resources has been flagged as a key concern in previous reports by IIPAG and PA. TfL is seeking to improve attraction and retention as far as possible, within the constraints it is subject to, and has taken steps to help address key shortages, for example through a recently let framework contract for Project Management Consultancy services, and a similar arrangement for engineering resources which is in train. However, we have observed continuing significant shortages on some programmes and projects which are among TfL's top priorities, and this leads us to question whether the allocation of scarce resources within TfL matches TfL priorities as well as it might. We recommend a review of resource

shortages, by discipline, across the capital programme and a comparison of this picture with investment priorities.

4. Progress with Cross-cutting Work

4.1. We are currently undertaking our regular reviews of TfL Benchmarking and First and Second Lines of Defence, which we intend to submit to the December meeting of the Audit and Assurance Committee. We are also in the process of agreeing terms of reference for an update review of the Procurement and Commercial Improvement Programme.

5. IIPAG recruitment

5.1. With the Chair of the Audit and Assurance Committee we have nearly completed the interviews for additional members for the main IIPAG group, and for the new TTL Properties Limited (TTLP) IIPAG Sub Group, with appointments to be made shortly.

Alison Munro
Chair, IIPAG
September 2022

Programmes and Investment Committee

Date: 19 October 2022

Item: TfL Project Assurance Update



This paper will be considered in public

1 Summary

- 1.1 This paper provides an update on the project assurance work undertaken during Quarter 2 of 2022/23 (26 June to 17 September 2022). Five programme reviews were undertaken during this time, with the Independent Investment Programme Advisory Group (IIPAG) involved in all five. In the same timeframe seven project assurance reviews were undertaken, with IIPAG involved in four of these.
- 1.2 These reviews gave rise to a total of 65 recommendations being made, of which eight were considered to be critical issues. Critical issues are those that the TfL Project Assurance team or IIPAG believe should be addressed before projects proceed to the next stage.
- 1.3 A paper is included on Part 2 of the agenda which contains exempt supplemental information that is exempt from publication by virtue of paragraph 3 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the business affairs of TfL. Any discussion of that exempt information must take place after the press and public have been excluded from this meeting.

2 Recommendation

- 2.1 **The Committee is asked to note the paper and the exempt supplementary information on Part 2 of the agenda.**

3 Background

- 3.1 The TfL Project Assurance update provides the Committee with a summary of the second line assurance, provided by TfL's Project Assurance team, and third line assurance, provided by IIPAG.

4 Summary of Project Assurance Activity

- 4.1 From the reviews undertaken TfL Project Assurance made 36 general recommendations and raised six critical issues, all of these being agreed with the project teams concerned.
- 4.2 IIPAG made 21 general recommendations and raised two critical issues, with all agreed with the respective project teams.
- 4.3 The following graphs show the number of open recommendations, the number that are overdue, and the number closed in the last three quarters. There are no overdue critical issues.

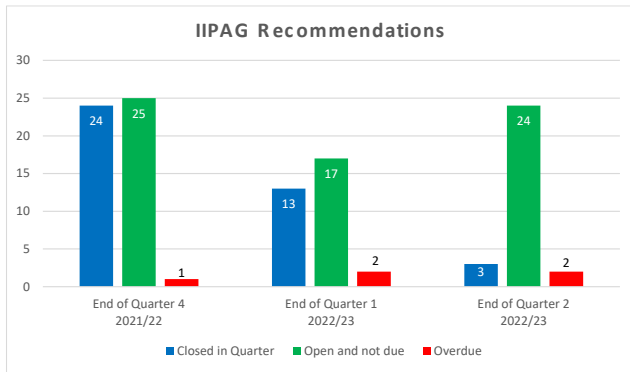


Figure 1: IIPAG Recommendations

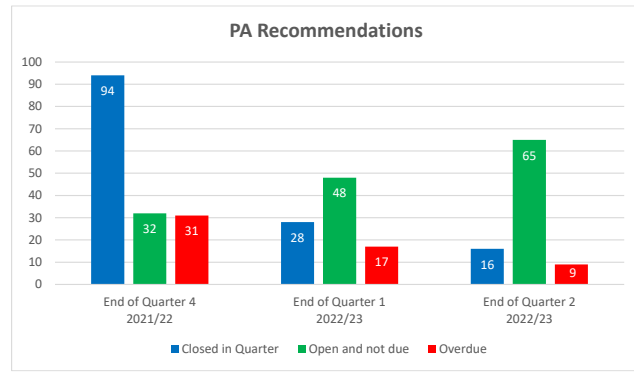


Figure 2: Project Assurance Recommendations

4.4 The following graph shows the length of time that the overdue recommendations have been overdue by. The information shows critical issues and general recommendations and the business area that the recommendation relates to (CCO being Chief Capital Officer, COO is Chief Operating Officer, CCSO is Chief Customer and Strategy Officer and CFO is Chief Finance Officer).

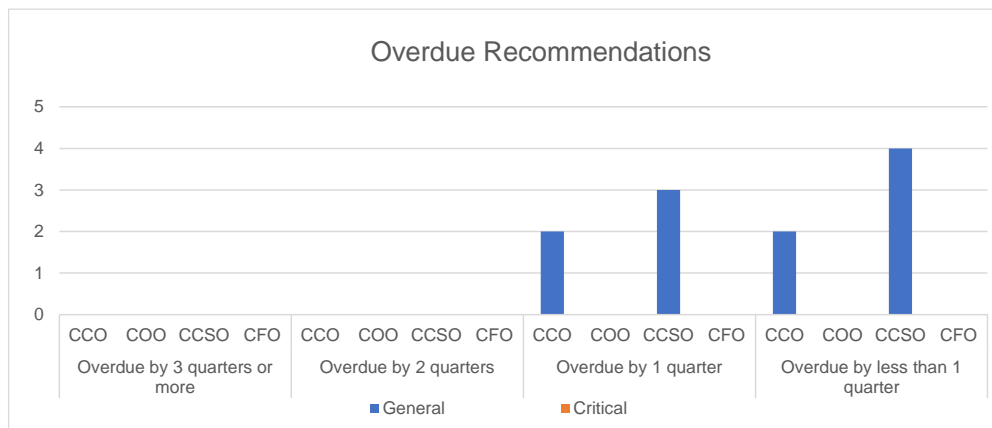


Figure 3: Breakdown of Overdue Recommendations

List of appendices to this paper:

Exempt supplementary information is included in a paper on Part 2 of the agenda.

List of background papers:

None

Contact Officer: Howard Carter, General Counsel
 Email: HowardCarter@tfl.gov.uk

Programmes and Investment Committee



Date: 19 October 2022

Item: Piccadilly Line Upgrade - Stage 1 Progress Update

This paper will be considered in public

1 Summary

- 1.1 This paper updates the Committee on progress with delivery of Stage 1 of the London Underground (LU) Piccadilly Line Upgrade (PLU), following its authorisation in May 2018, and the previous annual update in July 2021.
- 1.2 Supplementary information is included in Part 2 of the agenda for Members. This information is exempt and is therefore not for publication to the public or press by virtue of paragraph 3 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the business affairs of TfL.

2 Recommendation

- 2.1 **The Committee is asked to note the paper and the exempt supplementary paper on Part 2 of the agenda.**

3 Background

- 3.1 The Piccadilly line contributes more than 10 per cent of LU's total ridership with pre-pandemic demand of over 200 million annual trips. The line provides key transport links between North and West London serving Heathrow Airport, the West End and St Pancras International station.
- 3.2 The existing rolling stock fleet on the Piccadilly line was introduced in the mid-1970's and is over 45 years old. The upgrading of the Piccadilly line is a TfL priority in view of very high levels of historic and projected demand, the age and condition of the existing rolling stock, and the inherent capacity constraints of the existing signalling system and limited fleet size.
- 3.3 The PLU was established as part of the wider Deep Tube Upgrade Programme to replace life-expired trains and signalling systems and to maximise capacity on the Piccadilly line to meet existing and future demand. The PLU is scheduled to be delivered in two key stages:
 - (a) **Stage 1** – Infrastructure upgrades and enabling works to support the introduction of 94 new trains to replace the existing rolling stock fleet: and
 - (b) **Stage 2** – Replacement of the existing signalling system and procurement of up to 18 additional trains to enable higher frequency services with highly reliable automatic train operation.

- 3.4 In May 2018, the Committee approved:
- (a) Programme and Project Authority of £3,294m for the procurement of new rolling stock and associated infrastructure enabling works for the introduction of new trains on the Piccadilly line; and
 - (b) Procurement Authority of £1,657m for the award of a contract for the design, manufacture, and supply of 94 new Piccadilly line trains to Siemens Mobility Limited (SML) with a Fleet Services Agreement for whole life maintenance support.
- 3.5 In July 2021 the overall Programme and Project Authority was reduced by £300m, from £3,294m to a total of £2,994m to reflect the progressive reductions in Estimated Final Cost for the Stage 1 PLU Programme since May 2018.
- 3.6 Since the previous update to the Committee in July 2021, the TfL Business Plan and Budget has remained under severe financial pressure following the impact of the coronavirus pandemic on TfL's ridership and revenues. Despite these pressures and challenges around resources, the delivery of PLU Stage 1 and the schedule for introduction of the new trains remains on target and as reported in 2021. However, several preceding milestones have slipped, mainly due to unavailability of key resources compared with the previous forecast.
- 3.7 Good progress continues to be made on PLU through continued collaboration and innovation. Key achievements include the commencement of new train manufacture by Siemens Mobility Limited. in Vienna, delivery of new train stabling facilities at South Harrow and the design and installation of infrastructure enabling works across the Piccadilly line. The new Siemens manufacturing facility in Goole, Humberside, is also progressing well, where half of the new trains will be assembled.
- 3.8 This paper provides a summary of progress achieved since July 2021 and the opportunities being pursued to reduce schedule risks and improve delivery efficiency.

4 Programme Benefits

- 4.1 Prior to the pandemic, significant crowding was already prevalent on the Piccadilly line due to the capacity constraints of the existing trains and signalling. As Tube demand recovers, peak crowding is expected to return to pre-pandemic levels in the early 2030s and to increase further as population and employment grows with economic recovery.
- 4.2 The PLU is core to the Mayor's Transport Strategy, enabling increased public transport capacity, more environmentally-friendly services that contribute to carbon reduction, and a more pleasant customer experience – which will contribute to increased ridership. PLU Stage 1 and the (currently unfunded) Stage 2 signalling upgrade will enable wider economic growth, both in London and across the UK through more than 25,000 jobs across the UK in the primary, secondary, and tertiary supply chains. Improved services will support the construction of more than 61,000 new homes in the vicinity of Piccadilly line stations.

- 4.3 Stage 1 of the PLU will deliver essential asset renewals with the replacement of the life-expired Piccadilly line trains, enabling the following key benefits:
- (a) longer, more spacious and fully accessible walk-through trains;
 - (b) an uplift of peak services from 24 trains per hour (tph) to 27tph, with the increased fleet size, to achieve a 23 per cent overall increase in peak service capacity from current levels;
 - (c) improved service performance and very high levels of reliability from modern rolling stock and sub-systems;
 - (d) a greatly enhanced customer experience through the introduction of air-cooling, improved customer information and security systems; and
 - (e) improved energy efficiency, reducing annual energy consumption by more than 20 per cent compared with today's Piccadilly line service, enabling decarbonisation.
- 4.4 Stage 2 of the PLU, if funded in future, will deliver further service enhancements through a line-wide signalling upgrade, including:
- (a) significant reductions in customer journey times;
 - (b) improved service reliability through automatic train control (as in operation on the Jubilee, Northern and Victoria lines);
 - (c) fleet and signalling capability for a peak service of up to 36 tph in the central area – as now achieved on the Victoria line - to deliver a 64 per cent overall increase in peak capacity from today's service.

Progress Since Previous Update

- 4.5 Since the previous report in July 2021, and following the removal of Covid restrictions, the programme and its supply chain partners have made good progress towards delivery of the Stage 1 upgrade scheme.
- 4.6 The Stage 1 programme remains on target for the first new trains to enter passenger service in summer 2025. Infrastructure enabling works have now progressed to the implementation stage with commencement of physical works across all Piccadilly line sites.
- 4.7 Since the previous update the PLU programme has continued to experience resourcing difficulties, with availability unable to keep pace with planned resource demand. This issue has been made more acute due to problems in recruitment and retention of staff in key roles, which is a symptom of the current highly competitive market for critical skills in the rail sector.
- 4.8 Whilst the resourcing challenge has been mitigated partially through internal prioritisation of resource, collaborative and strategic resource planning and creation of frameworks for external resourcing services, critical path activities have been impacted. This has resulted in misalignment of the infrastructure and train delivery programmes. Mitigations are being explored to recover these

slippages and/or lessen the impact on the train introduction schedule.

New Trains

- 4.9 The new, higher capacity Siemens trains will be fully accessible and feature walk-through interiors, saloon air-cooling (for the first time on a deep tube train) and all-double doorways to improve boarding and alighting. Modern audio/visual communication systems will include digital display screens for customer information and advertising, a new CCTV system for the train operator to view the platform and train interface from the driving cab and improved customer security cameras.
- 4.10 Following achievement of the key Tier 1 Final Design milestone in 2021, the manufacturing contract with Siemens Mobility Limited has progressed further with the start of assembly of the first new vehicles in Vienna during autumn 2021.
- 4.11 The first vehicle underframes and bodysells have been assembled and finished in the TfL corporate livery scheme for 'first in type' acceptance prior to series production.
- 4.12 Siemens have progressed with the procurement and manufacture of key sub-system elements of the train, including underframe equipment, the propulsion system and train door system. The first fully assembled train is scheduled for completion by summer 2023 and will then undergo an extensive programme of pre-delivery reliability proving at Siemens' Test and Validation centre in Westphalia, Germany.
- 4.13 Despite the resourcing challenges referred to above, the programme currently remains on target to receive the first train to London for testing on the Piccadilly line in summer 2024 with the first train scheduled to enter passenger service in summer 2025.
- 4.14 Construction of Siemens' c.£200m UK train manufacturing facility in Goole, East Yorkshire is nearing completion with the train assembly hall to commence production in early 2024. This facility is creating an estimated 700 skilled jobs. It has also enabled an estimated 250 jobs during construction and up to 1,700 indirectly in the supply chain. The new UK rail manufacturing facility will support around 80 graduates and apprentices and will be complemented by the recently opened Rail Accelerator and Innovation Solutions hub for Enterprise (RaisE) campus for industry research and development. Once completed, it is expected that approximately 50 per cent of the new Piccadilly line trains will be assembled at the new UK facility in Goole.

Infrastructure works

- 4.15 Following a competitive procurement, a new High Voltage (HV) Power framework is now in place and with two suppliers (Balfour Beatty Rail Limited and UK Power Network Services Limited.) now engaged, the first two work packages have commenced. This framework will enable design and delivery of the critical sub-station and distribution network upgrades required to support new train introduction. Initial focus is on provision of additional power system capacity at Sudbury Hill, Northfields, and Cockfosters sub-stations to support the upgrades to the train maintenance depots and stabling facilities. Additionally, upgrades are

being progressed at Hyde Park Corner and Leicester Square sub-stations to enable new train operation.

- 4.16 Complex upgrade work is also underway at Manor House where an existing TfL telephone exchange is being relocated to enable the installation of a new HV power coupling transformer. Enabling works are also underway at Cobourg Street in readiness for new HV equipment installation.
- 4.17 Modifications to the existing signalling system are underway to ensure compatibility with the new trains. These works include the re-positioning of lineside signals and installation of additional signal indicators to ensure visibility from the new, longer trains at all locations. Additionally, 76 legacy 'delta'-type track circuits have been replaced with a new design of train position detector. This is necessary to ensure the existing safety signalling system is not affected by electro-magnetic interference (EMI) generated by the new trains.
- 4.18 Surveys and designs are underway for the localised platform modifications needed to provide level access to the new trains for wheelchair users at step-free stations to meet Rail Vehicle Accessibility Regulations (RVAR) requirements. An innovative new "platform hump" solution is being developed which will use lightweight Fibre Reinforced Polyester materials instead of concrete. This will drive further cost efficiencies, as well as reduce installation times, safety risks and the carbon footprint of the delivery programme.
- 4.19 Following design development, implementation has also commenced for the new One Person Operation Closed Circuit TV (OPO CCTV) system with the first installation at Caledonian Road station. This system will improve safety through transmission of high-quality digital images of the Platform-Train Interface (PTI) to both the train operator and the line control centre to ensure the safe departure of the train from the platform.

Depots and Stabling

- 4.20 Following extensive site clearance, groundworks and drainage improvements, major construction work has taken place at South Harrow sidings. This upgrade has expanded the site from an original six train capacity to 12 longer sidings to accommodate the new rolling stock, increasing stabling capacity on the line.
- 4.21 The upgrading of track, power supplies, signalling, security fencing, track drainage and access walkways have progressed. Significant delays were encountered due to adverse weather conditions and repeated flooding of the site during the winter period. The first four new stabling sidings have now been commissioned and were returned to service in July 2022. The remaining eight new sidings are on schedule for completion and handover in February 2023. Whilst the expansion of the site has required the removal of some vegetation, the final scheme will increase biodiversity by 48 per cent compared with the original site through creation of new grassland, scrub enhancement and replanting.
- 4.22 The first stage of the train maintenance depot upgrades at Northfields and Cockfosters has commenced with the installation of three new sidings to the West of Northfields station. These new sidings will augment stabling capacity on the line and facilitate the start of extensive reconstruction work at Northfields depot.

- 4.23 Detailed design is progressing for modern, efficient, and environmentally sustainable train maintenance and stabling facilities for the expanded fleet of new trains. The upgraded depots will feature 'green roof' designs for rainwater harvesting and storage to provide 'grey' water for depot services and train washing. Large roof-mounted solar panel arrays will provide low voltage power supplies for heating and lighting in the depot complex.
- 4.24 Extensive site clearance work and procurement has commenced at Cockfosters Depot to enable construction of a new Wheel Turning facility as part of the first stage of enabling works for the depot upgrade.

Operational Readiness

- 4.25 Planning and preparations have continued to ensure sufficient, trained train operations and maintenance staff are available for the introduction of new trains on the Piccadilly line. Operational readiness plans are being developed covering staff recruitment and familiarisation in line with the delivery schedule for driving simulators and the first new trains during 2024.
- 4.26 Operational leads are working closely with the project team and Siemens to understand new equipment maintenance regimes, and the facilities and skills required for maintenance and servicing of the new trains.

Innovation opportunities

- 4.27 Development funding was secured from Innovate UK in 2019 for the PLU Programme to join the National Skills Academy for Rail (NSAR) Transport Infrastructure Efficiency Strategy (TIES) 'Living Lab' initiative. This helped to part-fund three demonstrator projects focusing on Technology and Modern Methods of Construction, which have now been successfully delivered. These were:
- (a) **Scalable Modular Equipment Rooms** – a prototype installation of scalable, factory-made equipment enclosures which offer faster, safer, and more efficient site installation with potential for 30 per cent savings over conventional constructions. Design and construction for the prototype has been completed and the equipment room is on display at our Innovation Spotlight Centre at TfL's Tunnelling and Construction Academy (TUCA) in Ilford. This innovation will allow further cost reductions for Signalling Upgrades and is ready to roll-out further subject to funding for future upgrade schemes;
 - (b) **Deep Tube Cooling Panel** – a prototype, low maintenance platform air cooling solution for deep tube stations for installation and testing in a live station environment; A prototype was installed at a disused platform at Holborn station to evaluate its performance in a tube station environment. This innovative design for platform air cooling is being developed for both the Piccadilly line and wider network application as a potential design solution for reducing platform area temperatures and to enable future train service level enhancements under Stage 2 of the line upgrade. An earlier prototype is on display in the Innovation Spotlight Centre at TUCA. The next step will be to install and prove this innovative solution in an operational platform environment (currently expected to be at Knightsbridge), subject to future funding; and

- (c) **Automated Cable Management Design** – software development is being undertaken for an automated design of complex cable management and support systems. This will reduce design costs by up to 70 per cent and improve safety and sustainability through reduced installation time on site. The software was successfully developed and proven to feasibility stage. TfL intends to develop this further and embed in our new ways of working for any future upgrade schemes.
- 4.28 Several other live innovation opportunities are also being progressed including lightweight platform humps, aluminium DC power cables, a train-mounted laser system for infrastructure gauge clearance survey and digital twinning of the Piccadilly line railway.
- 4.29 Following the successful delivery of the PLU Demonstrator Projects, the concept of the 'Living Lab' has been expanded as a pan-TfL initiative. This is a key enabler of our Capital Efficiency Plan and will ensure the benefits can be harnessed across TfL, allowing prioritisation of Problem Statements and alignment with TfL's wider Asset Strategy.
- 4.30 A key enabler of the TfL Living Lab concept will be our ability to access time and expertise from Industry Innovation Hubs and Accelerators. As such we have now formalised our partnership with Siemens and the University of Birmingham at RAISE (the new Railway Innovation Centre at Goole). As a first step in this partnership, we have now started to share problem statements linked to our Capital Efficiency Plan and expect to see output proposals by the end of 2022.

5 Efficiencies and Savings

- 5.1 Since the July 2021 update, the PLU Programme has continued to refine the scope, specification, and cost of Stage 1 delivery to identify further efficiency savings, risk, and uncertainty reductions. Headline movements in the Stage 1 Estimated Final Cost (EFC) (at P6, 2022) are detailed in Table 1 below.

Table 1: PLU Stage 1 EFC position and movements since July 2021

Authority Position	£(m)'s	
Original Authority - Initial development	£	154
Stage 1 - Authority (May 2018)	£	3,141
Programme & Project Authority (May 2018)	£	3,294
Authority Reduction approved - July 2021	-£	300
Current Authority	£	2,994
July 2021 - reported EFC	£	2,902
EFC Movements since July 2021	£(m)'s	
Indexation (new rates applied)	£	40.5
Cost and Risk increases: Including resources	£	15.3
Cost reductions and efficiency opportunities realised	-£	36.2
Scope deferrals to Stage 2	-£	20.9
Current Stage 1 - EFC	£	2,900.7
Variance from original Authority	-£	393

- 5.2 Since July 2021, industry price increases have led to the introduction of updated inflation indices by TfL which has added £40.5m to the overall cost of the Stage 1 forecast.
- 5.3 Through further maturity of PLU system design and performance and applying a Value Engineering approach, some £20.9m of scope items have been identified for deferral to the Stage 2 programme where these are not necessary to support the introduction of new trains under Stage 1.
- 5.4 Through active management of risk and the realisation of cost reduction opportunities a further £36.2m saving has been achieved. Overall, the EFC for Stage 1 has been reduced by £1.3m since July 2021.

6 Benefits and Value

- 6.1 As authorised in May 2018, the business case for Stage 1 implementation, relative to the “Do Minimum” base, had a Benefit-Cost Ratio (BCR) of 5.3:1. At the update in March 2020, the Stage 1 BCR had increased to 5.6:1 following reductions in the estimated final cost achieved to that point.

- 6.2 By July 2021, the Stage 1 business case had been further refreshed to reflect savings and efficiencies achieved in the EFC, in addition to a six month deferral in benefits and revenue generation resulting from the revised Stage 1 delivery schedule. The Stage 1 BCR was improved slightly, to 5.9:1 relative to the 'Do Nothing' case.
- 6.3 Currently, the Piccadilly line demand is around 60-70 per cent of 2019 levels and longer-term public transport demand and travel patterns across London remain uncertain.
- 6.4 Since July 2021, extensive work has been carried out by TfL to update public transport demand models to reflect latest projections of post-pandemic travel across the TfL network to 2041. Through scenario planning, a range of uncertainty has been defined to inform demand forecasting. Within this range, two demand scenarios have been developed by TfL to assess and understand the possible changes to the nature of travel, in terms of origin/destination patterns, trip lengths and trip timing:
- (a) **2041 Reference Case** - a "business as usual" forecast that represents London's growth and travel behaviour returning quickly to pre-pandemic levels.
 - (b) **2041 Hybrid Case** – a more conservative forecast which reflects the impact of longer-term changes to working patterns and travel behaviour, accelerated by the pandemic.
- 6.5 The Reference case assumes substantial shorter-term growth with Piccadilly Line boarders growing by up to 30 per cent on pre-pandemic levels by 2041. The Hybrid Case assumes a more gradual return of demand by 2041.
- 6.6 Using these projections of demand and the latest TfL Value of Time the PLU Business Case has been refreshed to update previous assessments of the customer benefits from the planned Piccadilly line train service enhancements.
- 6.7 With latest cost and benefits data, the higher 'Reference' demand scenario confirms the strong business case for the Stage 1 programme with an overall BCR of 6.96:1 and a Net Present Value (NPV) of £2,502m, which represents an increase from July 2021. Similarly, the currently unfunded Stage 2 scheme is shown to be financially positive.
- 6.8 For the lower 'Hybrid' demand scenario, the refreshed analysis shows a reduced BCR for the Stage 1 programme of 5.04:1 and a Net Present Value of £2,192m. These results confirm the continued robustness of the Stage 1 Piccadilly line upgrade business case.
- 6.9 Using the latest cost estimates and the currently deferred delivery schedule, the updated modelling also shows an overall BCR for the Stage 2 scheme of 11.16:1 based on 'Hybrid' levels of demand. This confirms the continued strong business case for the currently unfunded Piccadilly line signalling upgrade and service enhancements.

7 Assurance

- 7.1 A Targeted Assurance Review has been undertaken for PLU, led by TfL Assurance as part of the continuous assurance process for this programme.
- 7.2 The review highlighted concerns over the current trend of the programme and ongoing failure to meet Tier 3 delivery milestones, compounded by specialist internal resource shortages.
- 7.3 If this trend continues the programme will not meet the target dates for the migration states, resulting in a critical position whereby the trains will be delivered ahead of the infrastructure being ready for train testing.
- 7.4 Key recommendations from the review include the need to consider the scenario of a delayed programme, and the contingency plans which could be put into place should the position be confirmed as unrecoverable.
- 7.5 As the programme is reporting schedule risk on key migration state milestones and resourcing issues are not being addressed in a timely manner, it is recommended that the governance model is reviewed to validate it remains fit for purpose and will support the programme through detailed design and delivery.
- 7.6 A management response has been prepared to address all the review recommendations.

List of appendices to this report:

Appendix 1: New Siemens trains and PLU delivery progress.

A paper containing exempt supplemental information is included on Part 2 of the agenda.

List of Background Papers:

Independent Investment Programme Advisory Group (IIPAG) Report and Management Response

TfL Project Assurance Report and Management Response

Contact Officer: Stuart Harvey, Chief Capital Officer
Email: StuartHarvey@tfl.gov.uk

Contact Officer: David Rowe, Interim Director of Investment Delivery Planning
Email: DavidRowe@tfl.gov.uk

Appendix 1: New Siemens trains and PLU delivery progress

Figure 1: Siemens 24Tube Stock: Train Exterior showing driving cab



Figure 2: Walkthrough Train interior showing digital information screens



Figure 3: Siemens 24 Tube Stock: First production vehicle bodyshell painted in TfL livery



South Harrow Sidings Upgrade

Figure 4: Site construction work 2022 – final groundwork preparation prior to track laying



Figure 5: First 4 new stabling sidings brought into use, July 2022



Innovation

Figure 6: Lightweight Fibre Reinforced Polyester platform 'hump' prototype



Figure 7: Modular, prefabricated Equipment Room installed at TUCA, Ilford



Figure 8: Prototype Cooling panel under test at Holborn station



[page left intentionally blank]

Programmes and Investment Committee

Date: 19 October 2022

Item: Elephant & Castle Station Capacity Upgrade

This paper will be considered in public

1 Summary

- 1.1 The purpose of this paper is to update the Committee on progress with the delivery of the London Underground (LU) Elephant & Castle Station Capacity Upgrade (ECSCU) project.
- 1.2 The Financial Authority for ECSCU is currently fully covered by third-party funding agreements with the Greater London Authority (GLA) and the London Borough of Southwark (LBS).
- 1.3 Additional requested Authority remains within the limits of existing third-party funding agreements and does not represent any additional financial commitments for TfL or future budgets.
- 1.4 A paper is included on Part 2 of the agenda, which contains exempt supplementary information. The information is exempt by virtue of paragraph 3 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the business affairs of TfL. Any discussion of that exempt information must take place after the press and public have been excluded from the meeting.

2 Recommendations

- 2.1 **The Committee is asked to note the paper and the exempt supplementary information on Part 2 of the agenda and to approve additional Programme and Project Authority for the sum set out in the paper on Part 2 of the agenda for the Elephant & Castle Station Capacity Upgrade Programme and a corresponding increase in the Major Stations Programme.**

3 Background

- 3.1 Located within London's Central Activities Zone (CAZ), Elephant & Castle station is a Zone 1/2 boundary station served by the Bank branch of the Northern line and the Bakerloo line (for which it is also the current southern terminus). Each line has a separate ticket hall at street level and interchange within the station. Updated projections based on post-COVID demand continue to see the station operating at above designed capacity.
- 3.2 Elephant & Castle station is a strategic interchange between Tube, Bus and Rail services from across southeast London. In total, 32 London bus routes serve the station. Elephant & Castle National Rail station (Thameslink) is located 120 metres to the east of the LU station and is served by 24tph.

- 3.3 The ECSCU will introduce escalator access to Elephant & Castle station, street to platform step-free access (SFA) and deliver a larger, higher-capacity Northern line ticket hall (NLTH) in conjunction with the redevelopment of the Elephant & Castle Shopping Centre site.
- 3.4 In July 2019, safeguarding for a future integrated station at Elephant and Castle was progressed. This would enable the planned future Bakerloo Line Upgrade & Extension (BLUE) project to connect to the new ticket hall.
- 3.5 The ECSCU includes the delivery of a new station box to be built by a third-party developer (Delancey) in fulfilment of its planning obligations. TfL will have responsibility for the construction of new underground tunnel connections (using third party funding) and for fit out of the new station entrance, which will be subject to future funding as explained below.
- 3.6 As TfL's financial position changed due to the impact the coronavirus pandemic on ridership, we did not commit to our original intended share of funding for the completion of the scheme.
- 3.7 Instead, rather than impede the commencement of the development which provides significant regeneration benefits to London, it has been agreed with LBS and the GLA to use only existing third-party funding to deliver a core scope of works which includes the new station box, enabling works and connecting tunnels (known as Stage 1).

4 Strategic Case

- 4.1 The ECSCU is identified as a key transport infrastructure upgrade by the Mayor's Transport Strategy (MTS), the London Plan, and Elephant & Castle Supplementary Planning Document (SPD). Upgrading capacity and accessibility at Elephant & Castle station is critical in supporting the delivery of over 10,000 new jobs and 7,500 new homes across the Elephant & Castle Opportunity Area.
- 4.2 In total, over £4bn is being invested in the Elephant & Castle Opportunity Area by both the private and public sector. Following the adoption of the Elephant & Castle SPD by the Mayor and LBS, the Elephant & Castle Partnership was established to bring together the key organisations working in the area including landowners, property developers, housing associations, universities, the GLA, TfL, and LBS.
- 4.3 Both the London Plan and London's Central Activities Zone Supplementary Planning Guidance stipulate that the development of homes and jobs in central and inner London areas with PTALs of 5 and above will be car free with public transport being the principal mode of access, including Elephant & Castle.
- 4.4 The ECSCU also supports phase one of the Old Kent Road Opportunity Area for which permission for 9,500 new homes have already been approved independent of any future planned improvements to the Bakerloo line.

4.5 The project is also a key element of the Mayor’s 2018 Transport Strategy to deliver step-free access and capacity improvement across the London Underground network, supporting the strategic outcomes of ‘New homes and jobs’ and ‘A good public transport experience’.

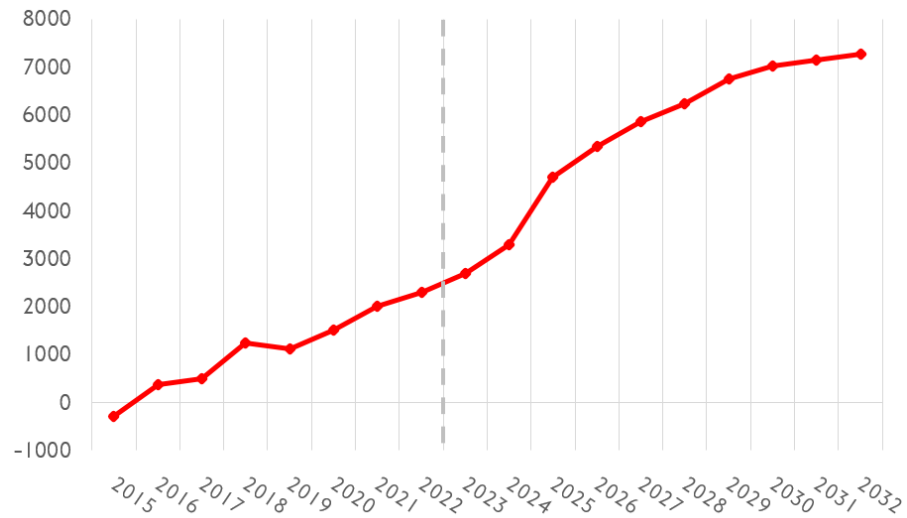


Figure 1: The cumulative number of new homes built within the Elephant & Castle Opportunity Area will reach 7,500 by 2032

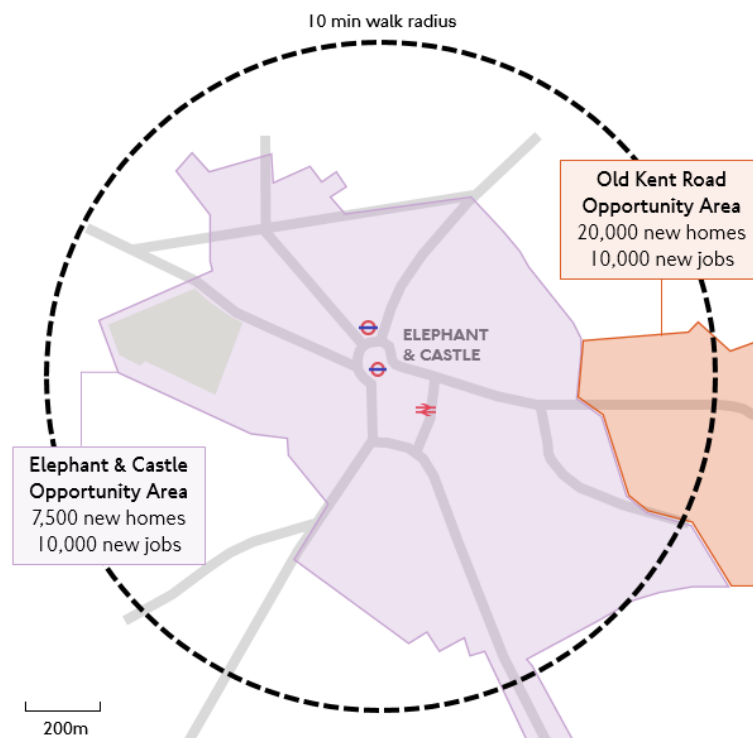


Figure 2: Location of Elephant & Castle station in relation to the Elephant & Castle and Old Kent Road Opportunity Areas

5 Current Progress

- 5.1 The current Programme and Project Authority was approved by the Committee in October 2021. Since this time, the project has achieved the following milestones:

Development Agreement and Station Box

- 5.2 On 21 December 2021, the TfL project team entered into a Development Agreement with the developer of the Elephant & Castle Shopping Centre. The agreement utilises a portion of the existing third-party funding from the GLA and LBS to pay for the delivery of a new station box by the developer for a fixed price. The developer commenced onsite in March 2022 and works are expected to be completed by February 2025.



Figure 3: Developer works on the new station box at Elephant & Castle

Early Enabling Works

- 5.3 During the Bank Blockade (January – April 2022), the project team successfully completed £1m of early opportunity works to relocate assets from future platform breakthrough areas for the main tunnelling works. The works comprised of asset relocations on the Northern line platforms, installation of ducting in the redundant pedestrian subway, asset relocation, and demolition of platform rooms to prepare for tunnelling breakthroughs, tunnel surveys at breakthrough locations, and removal of hazardous materials. The works were successfully completed on time with zero safety incidents.

Revised Delivery Approach

- 5.4 In April 2022 due to the continued funding uncertainty caused by the coronavirus pandemic on ridership, the project was instructed to deliver the ECSCU in staged phases, allowing TfL to capitalise on existing third-party funding and the in-flight shopping centre redevelopment to commence delivery of a significant proportion of the station works at no cost to TfL.

5.5 The project was nominally split into two stages, Stage 1 and Stage 2 (see Table 1 below). Current third-party funding comfortably covers Stage 1 works, with Stage 2 subject to future additional funding (note this agreed funding is not scope-specific, and any surplus following Stage 1 can be used for Stage 2 works).

5.6 The high-level scope split between Stage 1 and Stage 2 is outlined below:

Table 1: High level scope split between Stage 1 and Stage 2

Stage	Item	Status
Stage 1	Early enabling works	Funded, completed
	Station box	Funded, under construction
	Tunnelling works	Funded, PIN issued
Stage 2	Stage 2 feasibility study	Funded, tender to be issued
	Beneficial Scope	Funded, tender to be issued (pending this approval)
	Station fit out to include: - Delivery of step-free access to the Northern Line - Installation of new lifts and escalators - Fit-out of new ticket hall - Decommissioning of existing Northern Line ticket hall - Bringing into use of new entrance and ticket hall	Unfunded

5.7 Stage 1 comprises the new station box and connecting passenger tunnels, plus ancillary works. Stage 2 is currently unfunded and comprises the fit out of the new station entrance and bringing into use, plus the decommissioning of the existing Northern Line station entrance.

5.8 The project continues to take an adaptable approach to the unfunded scope and will shortly be undertaking a feasibility study to review an agile delivery approach and minimum scope for Stage 2 works (see paragraphs 5.15-5.17 below).

5.9 The project is also seeking to maximise funded scope by bringing forward some Stage 2 works into Stage 1, known as Beneficial Works, where this is affordable within the third-party monies allocated and offers economic benefits in doing so (see paragraphs 5.18-5.21 below).

- 5.10 The overall EFC for the project will be updated once the Stage 2 feasibility study and revised cost estimate have concluded. This scope includes do-minimums for both the decommissioning of the current station, and the fit out of the new station. Adopting a do-minimum approach is expected to reduce the EFC for these works.

Procurement Strategy

- 5.11 A Prior Information Notice (PIN) for the next planned delivery tranches was issued to the market in April 2022. The PIN invited expressions of interest for a series of works funded through the existing third-party agreements. The works include passenger tunnels and associated works, a small amount of beneficial scope (explained below), and a feasibility exercise for delivery of future works.
- 5.12 A follow-up supplier engagement day was hosted by TfL in May 2022. Over 60 suppliers attended the engagement day, with strong interest for the works shown by a diverse range of suppliers. Following the supplier day, a revised Procurement Strategy was approved in June 2022.
- 5.13 The revised and approved Procurement Strategy relates to the Stage 1 works (outlined in the Table 1 in paragraph 5.6 above) and the beneficial scope from Stage 2. As per the current programme, procurement for the remaining Stage 2 works will need to commence by September 2024. The scope of works and delivery approach will be dependent on the amount, and nature of, additional committed funding.
- 5.14 The existing ECSCU programme allows for iterative updates of the Procurement Strategy and, if appropriate, any synergies with the existing approved works will be identified and maximised.

Stage 2 Feasibility Study

- 5.15 At present, Stage 2 works (station fit out) remain almost entirely unfunded. A range of funding scenarios are being explored by the project team ahead of the need to decide if the current presumed continuous delivery approach will be adoptable before the associated necessary procurement processes that would need to begin by September 2024.
- 5.16 A feasibility study is currently being commissioned to appraise a staged approach to Stage 2 fit out which can be adapted to smaller increments of funding. The study will explore the minimum scope required to bring the new station into operational use and a review of the proposed delivery approach.
- 5.17 The potential benefits and disbenefits of an incremental approach to the delivery of Stage 2 will be known once the study is completed, the results of which are expected in Q2 of 2023.

Delivery Timeframe

5.18 The current delivery timeframe programme assumptions are as follows:

Table 2: Current delivery timeframe programme assumptions

Current Planned Date	Stage 1: Station Box and Passenger Tunnels	Stage 2: Station Fitout
Sept 2022	Pre-passenger tunnelling works tender released	Stage 2 Feasibility study tender released
Jan 2023	Award of contract for pre-passenger tunnelling works	Award of contract for Stage 2 Feasibility study works
May 2023	Passenger Tunnelling tender released	
June 2023		Stage 2 Feasibility study completed
Feb 2024	Award of contract for passenger tunnelling works	
Sept 2024		Stage 2 funding decision required to begin relevant procurement processes
Feb 2025	Station box completed	
April 2025	Passenger Tunnelling works begin onsite	<i>Current programmed commencement of procurement of fitout (subject to funding)</i>
Jan 2027		<i>Current programmed commencement of fitout detailed design (subject to funding)</i>
April 2028	Completion of Passenger Tunnelling works	<i>Current programmed commencement of fitout works (subject to funding)</i>
Jan 2030		<i>Current programmed completion of fitout works (subject to funding)</i>

Beneficial Scope

- 5.19 As a result of the adapted staged delivery approach, the ECSCU project has identified a package of works that could be brought forward from Stage 2 to Stage 1. By using existing third-party funding to bring these essential works forward to Stage 1, the project will be able to de-risk various elements of the Stage 2 works and reduce future potential inflationary impacts.
- 5.20 These works were originally classified as station fit out works under Stage 2 and were therefore excluded from the Programme and Project Authority sought from the Committee in October 2021.
- 5.21 The additional Programme and Project Authority requested in this paper for these beneficial works is fully covered by third-party income for ECSCU under the existing funding agreements with the GLA and LBS.

5.22 The identified beneficial works to bring forward from Stage 2 to Stage 1 comprise of:

Table 3: Identified beneficial works to bring forward from Stage 2 to Stage 1

Item of works	Expected benefit of bringing forward to Stage 1 delivery phase
Stage 2 Feasibility and Cost Estimate	Options studies to establish options to open station to customers to adapt to incremental funding
Power Supply Upgrade*	Brings forward the permanent essential power supply upgrade for the new station box to make it available for Stage 1 tunnelling contract works (reducing scope and cost of Stage 1 works). Achieves additional environmental and carbon benefits by removing the need for on-site diesel generators
Two fire doors in the Northern line/Bakerloo line interchange*	Improves fire safety at Elephant & Castle station for customers and staff in the interim
Risk	Associated with delivery of beneficial scope

The ECSCU project **will not commit to tendering these two elements unless sufficient financial headroom is maintained to fully cover the costs upon the finalisation of tenders from Stage 1 Tunnelling works.*

Inflation

5.23 Since the project last provided an update to the Committee, TfL has updated its guidance on applying the cost of inflation to projects based upon market conditions and wider inflationary trends. There is sufficient headroom in the existing third-party funding agreements for ECSCU to cover the revised inflation costs, however this additional amount was not foreseen when the Programme and Project Authority submission was made in October 2021.

5.24 To ensure improved accuracy, revised inflation rates have been specifically applied only to the relevant costs impacted by the increase, for example construction costs. For those elements which are being delivered for a fixed price between TfL and the developer, such as the delivery of the station box, no inflation increase has been applied.

6 Finance

6.1 The ECSCU has existing committed third-party funding agreements in place with the GLA and LBS.

6.2 The existing funding arrangements with the GLA provide the flexibility for TfL to use funding towards to both Stage 1 and Stage 2 scope as required (as described in paragraph 3.8).

6.3 At present there is a sufficient surplus between the committed third-party funding, and the beneficial scope for which authority is sought within this paper.

- 6.4 The project is seeking an increase of Programme and Project Authority for Beneficial Scope, inflation, and associated risk for the sum set out in paper on Part 2 of the agenda.

7 Next Steps

- 7.1 The project is preparing to go out to tender for the package of pre-tunnelling ancillary works (PTA) in November 2022. This will consist of the relocation of cables in the overbridge for the future tunnel breakthrough, invert cable relocation works, and, if authority is granted, certain elements of the beneficial scope works outlined in Section 5 of this paper. The outcomes of the PTA works will be fed into the main tunnelling tender to de-risk and remove any assumptions made during procurement.
- 7.2 Following the PTA, the project plans to go out to tender in May 2023 for the main tunnelling works, and, subject to the authorities requested within this paper, the remainder of the beneficial scope works outlined in Section 5.
- 7.3 As funding for Stage 2 (station fit out works) remains uncertain, the project will continue to assess alternative options for a renewed delivery approach. This includes undertaking a feasibility study to look at how a staged approach to the fit out could be delivered in response to smaller increments of funding (as referred to in paragraph 5.13 above).

8 Assurance

- 8.1 A Targeted Project Assurance review was carried out in July 2022. IIPAG also reviewed the report and attended the Final Review Meeting. TfL Project Assurance identified no critical issues and made four secondary recommendations. Appropriate mitigations have been agreed between the Project Team and Project Assurance.

List of appendices to this report:

Exempt supplementary information is included in a paper on Part 2 of the agenda.

List of background papers:

TfL Project Assurance Report

Management response to IIPAG and TfL Project Assurance Reports

Contact Officer: David Rowe, Interim Director of Investment Delivery Planning
Email: DavidRowe@tfl.gov.uk

Contact Officer: Stuart Harvey, Chief Capital Officer
Email: StuartHarvey@tfl.gov.uk

[page left intentionally blank]

Programmes and Investment Committee



Date: 19 October 2022

Item: London Underground Train Systems Programme

This paper will be considered in public

1 Summary

£m (2022 prices)	Existing Financial Authority	Existing Programme and Project Authority	Additional Authority Requested	Total Authority	Prior Years Spend	Forecast to 2027/28
Train Systems	1207.2	1791.0	0	1791.0	665.7	1995.3

Table 1: Summary of Programme and Project Authority (see Table 7 below for further detail)

- 1.1 This paper updates the Committee on the progress of the London Underground (LU) Train Systems Programme. Table 1 above shows that no additional Programme and Project Authority is requested at this time. The Programme includes the following sub-programmes: Fleet (Fleet Renewals, Engineering Vehicles and the Fleet Heavy Overhaul programme), Signalling and Control, and Track. The Programme maintains the safety, operability, and reliability of LU assets through a prioritised programme of renewals.
- 1.2 This submission builds upon previous papers to the Committee in October 2021 for Signalling and Control, and Track, and in December 2021 for the three Fleet sub-programmes. It brings these into a single Programme and Project Authority of £1,791.0m across the years to 2027/28. The phasing of this is set out in Table 7 below.
- 1.3 The focus of this paper is to:
 - (a) present the Programme achievements since the previous submissions;
 - (b) provide assurance to the Committee on the progress of the Programme and the future plans;
 - (c) set out the existing Programme and Project Authority alignment to the current forecasts for 2022/23 and 2023/24; and
 - (d) bring together the reporting of Fleet, Signals and Track under a single submission as endorsed by the Committee on 20 July 2022.

2 Recommendations

- 2.1 **The Committee is asked to note the paper and approve the consolidation of the LU Track, Signalling and Control, Fleet Heavy Overhaul, Fleet Renewals,**

and Engineering Vehicle sub-programmes into a LU Trains Systems programme with a total Programme and Project Authority of £1,791.0m.

3 Background

Strategic Context

- 3.1 The Mayor's Transport Strategy (MTS) has three key themes: Healthy Streets and healthy people; A good public transport experience; and new homes and jobs. Maintaining a State of Good Repair (SoGR) of LU assets is key to delivering all these plans. All LU Train System assets and their SoGR are directly related to a good public transport experience. Increased public transport use supports Healthy Streets and delivers growth in locations with high public transport capacity.
- 3.2 Constraints in the budget through the pandemic, coupled with pausing of project activities meant that spend was lower than planned during this period. In 2020/21, spend was £140m across Train Systems Renewals and this increased to £220m in 2021/22. In 2022/23 we have come through the period of low spend and are recovering to a run-rate which will maintain the assets in a SoGR in conjunction with increased spend in maintenance.
- 3.3 It is forecast that the spend across the Programme will be £250m this year. This increase continues into 2023/24 with the Programme building a capability going forward to deliver to a budget of £290m with a stretch delivery of up to £350m should funding allow.

Asset duties and responsibilities

- 3.4 The regulations that govern our operations with regards to assets include:
- (a) the Railways and other Guided Transport Systems (Safety) Regulations 2006, require TfL to apply to the Office of Rail and Road (ORR) for certification and authorisation to operate trains, stations, and infrastructure safely. Authority was approved by ORR in January 2022 for a further five years;
 - (b) the 2010 Rail Vehicle Accessibility (non-Interoperable rail systems) Regulations 2010 (RVAR) under the 2010 Equality Act; and
 - (c) regulations under the 1974 Health and Safety at Work Act including working at height, electricity, noise, manual handling, personal protective equipment, control of hazardous substances, and Construction Design Management.

Asset Strategy – Maintaining assets in a State of Good Repair

- 3.5 The SoGR describes the condition in which TfL seeks to maintain assets to provide a safe and reliable network that minimises whole life costs and, where appropriate, meets customer expectations. The SoGR is based on industry standard condition measures which differ by asset type, for example the standard that describes the specific condition of track is different to the condition for a signalling asset.

- 3.6 TfL records the asset condition using a combination of a five-point physical condition (Very Good, Good, Fair, Poor, Very Poor) and where the SoGR is below the preferred range it reflects the need for renewals investment to deliver a safe and reliable network and reduce the risk of injuries, restrictions, and closures arising from critical failure.
- 3.7 Data on assets is being collated to monitor both trends and forecast future performance. Asset Strategies are in place and are being enhanced to reflect ongoing developments in data maturity, asset condition and environmental targets. The high level SoGR measures for each of the areas that make up the Programme, together with details of how SoGR is measured and forecast for future years are provided in Appendix 1.

Impact on Operations

- 3.8 At present TfL is delivering a service operated percentage of 89.7 per cent across LU against a target of 90 per cent. Using a combination of increased funding in 2022/23 and further activities in maintenance, such as more frequent inspections and reactive interventions, we have limited the likelihood of assets being taken out of service, keeping current reliability constant in a constrained financial environment.
- 3.9 Due to the impact of the pandemic on TfL finances and subsequent prioritisation of works, the SoGR for all assets across TfL has deteriorated. The consequence is that there is a higher level of asset condition risk across the network. If this risk emerges, it will increase the likelihood of assets being restricted or taken out of service to maintain safety in the longer-term. This may include interim measures specific to the asset group and condition, such as reducing trains offered for service or speed restrictions being introduced along certain sections.
- 3.10 Available funding is targeted towards the most critical asset issues in the Asset Condition Report (ACR), prioritised as Code 1 (legal compliance) and Code 2 (safety related). Additionally in the Train Systems area there is a focus on longer term projects which maintain the operability of the railway, specifically related to overhauls of the major systems. These are often multi-year projects with significant design required followed by a long period of delivery, such as the Central line Improvement Programme (CLIP). This encompasses a major overhaul of the train fleet including motor renewals, the delivery of wheelchair bays, new passenger information systems and upgraded lighting to meet the requirements of accessibility legislation.
- 3.11 We will continue to use short-term mitigations to counter the service effect of asset deterioration as a result of the backlog of activities which have been replanned. In the short-term, the risk can be managed, however we need to ensure that work in the Programme continues so that the long-term impact on operations is minimised where possible.
- 3.12 In order to address the most pressing issues, the ACR is reviewed annually, and the most critical projects are moved forward to ensure that these works can be delivered and benefits realised. This is due to the lack of available funding to rectify all Code 1 and Code 2 concerns in a single year. Where projects are not progressed, risk assessment and mitigations are put in place to ensure that

safety is maintained. Typically, enhanced maintenance measures are deployed to ensure condition does not worsen over time.

- 3.13 The prioritisation process is based on a number of factors including SoGR, safety, strategic alignment with TfL priorities, commitments, value for money and priority of works. For example, the Fleet sub-programme consists of a number of overhauls and renewals projects which span multiple years. This approach ensures best value, otherwise the cost of the works and durations are likely to increase, there would be revenue loss from trains out of service and increased internal resource overheads. Through prioritisation it has been recommended that these continue in their entirety and as such Fleet will receive a larger proportion of authority across Train Systems. This will enable best value to be delivered through the use of multi-year contracts starting in 2022/23.
- 3.14 The projects within the Programme are designed to reduce and minimise these risks and are managed through a risk register across the Programme. This allows alignment of activity and/or funding to the biggest risks such that mitigations can be applied.
- 3.15 There is deterioration evident across the asset base which has an impact on operations. The average number of track defects, for example, are up from an average of five a week in 2020/21 to 10 a week in the first half of 2022/23. To mitigate this, enhanced inspections have taken place and there has been an increase in reactive re-railing projects to ensure that defects do not worsen resulting in unavailability.
- 3.16 The most significant business impacts which may build over time if renewals works do not take place are captured in Table 2 below. Actions to mitigate the risks within the programme are also shown. These are considered in terms of customer experience, costs, revenue loss arising from journey time increases, and reputational damage.

Table 2: Potential customer experience impacts

Risk	Impact	Action
Heavy overhauls not being undertaken on Victoria line, Jubilee line and S7 (District, Hammersmith and City, Circle) fleets	Removal of trains from service owing to exceeding mileage intervals – this is part of the safety system surrounding train operation. This leads to degradation of service as fewer trains are available	Maintain programme through rephasing where necessary to ensure delivery takes place to match emerging engineering issues. Increase maintenance inspections and reactive maintenance activities where required
The CLIP being unable to refurbish trains and bring them in line with RVAR leading to poor customer experience, particularly for	Removal of trains from service owing to exceeding mileage intervals – this is part of the safety system surrounding train operation.	Support the programme with more resource, allocation of higher funding level within Train Systems budget, early sight of emerging risks

Risk	Impact	Action
passengers with disabilities	<p>This leads to degradation of service as fewer trains are available</p> <p>Enforcement from ORR as trains are not refurbished to the agreed timelines as agreed through the RVAR derogation process</p>	<p>to enable timely mitigations.</p> <p>Work with engineering to extend service intervals where it is safe to do so</p>
Diminishing and unavailable spares in the market of critically obsolete components in Signalling systems lead to a reduction in functionality	Loss of functionality to operate a normal timetable, possibly leading to the unavailability of trains or areas of lines if spares are depleted before replacement can take place	<p>Continue to work with suppliers to secure 'last time buy' options and re-manufacture components where economical to do so.</p> <p>Where possible share spares across TfL, e.g. DLR and LU</p> <p>Harvest known good components from 'beyond economical repair' units to make in-house repairs where possible</p> <p>Incremental renewal projects will renew obsolete components with modern equivalents</p>
Track condition worsening	Speed restrictions put in place impacting timetable delivery, unavailability of track sections where condition falls below pre-determined thresholds	<p>Increased frequency of track inspections and resource made available to support this activity</p> <p>Increased spend in reactive re-railing</p> <p>Planning and organisational right sizing to achieve higher levels of spend from 23/24 onwards</p>
Current levels of spend leads to programme delivery risk	If critically obsolete systems are not replaced, unavailability of track areas or trains will increase. This may lead to significant customer delays or unavailability whilst solutions are found.	Early engagement with suppliers to inform their planning and resource availability to align with LU plans

Risk	Impact	Action
	Without the certainty of funding in future years the ability to offer attractive contracts to the market is restricted which may mean that projects cannot progress or costs will escalate leading to poor value for money	Planning and organisational right sizing to achieve higher levels of spend from 23/24 onwards

4 Programme Delivery in 2021/22

- 4.1 The pandemic and the resulting consequences for TfL's finances had a significant impact upon Programme delivery, particularly in 2021/22, with supply chain issues, material shortages and internal and external resource constraints all contributing to delays on several projects. Despite this, programmes continued to ramp up in the Fleet area in part due to long term programmes such as CLIP maturing. In April 2020, fleet overhauls were transferred into a capitalised sub-programme of works, previously having been undertaken as individual overhauls within maintenance. This change has enabled the overhauls to be delivered as a coordinated programme under capital project governance, enabling efficiency through economies of scale and the ability to plan and prioritise works according to resource availability. It also allows us to assess the total renewal expenditure across the fleet.
- 4.2 The total expenditure for this programme in 2021/22 was £223.2m against the revised budget (May 2021) of £269.9m. A summary by sub-programme asset group is shown in Table 3 below. There was a decline in spend during the height of the pandemic with stronger delivery performance in 2021/22. Figure 1 provides photographic examples of delivery.

Table 3: Actual spend by year (£m)

Programme £m	2017/18	2018/19	2019/20	2020/21	2021/22
Sub-programme - Asset Group					
Fleet	47.7	55.9	89.0	54.7	79.3
Signals	16.1	14.3	15.3	6.6	12.1
Track	150.6	114.3	119.6	76.0	131.8
Programme Total	214.4	184.6	223.9	137.3	223.2

- 4.3 The SoGR declined in 2021/22 due to project pauses and reductions in renewals-funding during the pandemic.
- 4.4 While some projects were paused in response to available funding, the programme had a number of notable successes including:
- completing testing of the new traction motor system as part of the CLIP;
 - completion of prototyping and installation of multi-purpose bays on the Bakerloo line (to comply with RVAR);
 - approval for use of Kirow cranes in Ruislip Depot;

- (d) completion of programmed heavy maintenance activities on 30 (of 36) Bakerloo line trains and the Central line Rail Adhesion Train;
 - (e) completion of 14 ventilation system replacements on the Victoria line;
 - (f) 9km of track renewed;
 - (g) 1.7km of track drainage renewed;
 - (h) design completed and delivery commenced on Bakerloo control system replacement;
 - (i) 26 points and crossings interventions;
 - (j) contracts awarded for Central line signalling and control system life extension; and
 - (k) competitive tendering process completed for the Remote Track Monitoring system.
- 4.5 This investment has maintained the current service levels and reliability of the assets but has not made significant improvements in the short-term. Once projects are completed, such as CLIP, benefits of reduced energy usage, improved reliability and reduced maintenance will be realised.
- 4.6 Appendix 2 contains a breakdown of this delivery by sub-programme since the last submission.

Figure 1 – Key deliverables in 2021/22

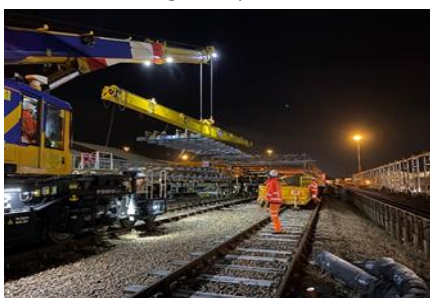
Acton
First CLIP pre-production train being shunted to Acton Works



Victoria Line
Pressure Ventilation Ducting Replacement



Ruislip Depot
Kirow cranes installing track panels



Central Line
Rail Adhesion Train overhaul



- 4.7 The TfL Capital Efficiencies Plan was developed in June 2021, which has focussed on driving efficiency and delivering ‘value for money’ (VfM) across all programmes. Efficiencies are defined as delivering more for less or spending to save in future years. Examples of efficiencies delivered within this programme include saving £3m through improved stabling being delivered at Ruislip prior to the delivery of the new engineering wagons.

5 Programme delivery for 2022/23

Scope in 2022/23

- 5.1 To date in 2022/23, the Programme overall is on schedule to deliver the planned outputs. Appendix 3 summarises a full list of planned renewals in-year by sub-programme, together with costs and brief descriptions of the works.
- 5.2 There is a good level of confidence that the 2022/23 Programme of planned work will be delivered. Close management of resources, existing contracts and programme risks will be required and, should further funding become available, a workbank of further opportunities for acceleration of priority schemes is in place.
- 5.3 Highlights up to P6 of 2022/23 are:
- (a) the Piccadilly line programme lift has successfully delivered double the forecast number of units with 16 against a forecast of eight by December 2022. CLIP has completed all testing and working on four of the five planned trains;

- (b) the Kirow cranes are approved for use in sub-surface network open sections;
 - (c) in the Signalling areas, the communications installation works have completed all site works;
 - (d) a contract has been awarded for replacement of central computers which control the signalling on the Jubilee and Northern lines; and
 - (e) Bakerloo line incremental signalling upgrade enabling works have commenced.
- 5.4 At the end of 2021/22 due the funding uncertainties a number of schemes had to be deprioritised which increased the risk of asset degradation. Since the August 2022 funding agreement, we are now working to phase these schemes back into the plan in this and future years. As noted above, this will be supplemented by maintenance activities in the short term.
- 5.5 Many activities will continue beyond 2022/23 as they have project lifecycles beyond one year, with ongoing contractual commitments. The scope of work in 2023/24 will include schemes continuing from 2022/23 (shown in Appendix 3) and newly initiated projects that will be presented in the next annual submission.

Option assessment

- 5.6 Several strategic options were considered at the TfL level and are as follows:
- (a) **Financially Constrained (this is the planned level of investment)** In this scenario, the short-term constrained capital investment will have a higher reliance on maintenance activity. It will not deliver the best whole life cost for the assets. The risk of SoGR deterioration remains and will require further unplanned and reactive interventions which could result in short term unavailability. Future renewals schemes are likely to need more extensive, and therefore costly interventions which would not be the case if further funding was available. The approach to efficiently manage the programme is outlined below in paragraphs 5.7 and 5.8 below;
 - (b) **Do Minimum:** Maintains a basic level of service at minimum cost to maintain safety and operability. This option represents an absolute lower bound level of investment to hold level of SoGR without excess maintenance and reactive interventions. This would renew assets at their latest possible time and may not provide the smoothest investment profile;
 - (c) **Moderate:** Aligns with the 2020 TfL Business Plan with amendments to account for pandemic impacts on delivery in 2020/21. This can support the key themes of the MTS, however, at a slower rate and to a lower level of customer experience than the 'High Ambition' option; and
 - (d) **High Ambition:** This scenario aims to deliver the ambitions of the MTS. It prioritises walking, cycling and public transport. Areas of focus include supporting Vision Zero, and carbon reduction.

- 5.7 TfL has implemented a prioritisation process consistent across portfolios to deliver the best possible outcomes from limited funding. This will be refined through business planning, taking into account the extra funding made available through the funding settlement for 2022/23 and 2023/24. Projects have been categorised based on the criticality of the asset and impact of failure.
- 5.8 Periodic reviews will be used to assess the level of delivery achieved, risks, and whether additional commitments can be made through change control should additional funding become available or if there is slippage in a particular area of the Programme. This approach gives maximum flexibility to target funds to deliverable priorities.

Table 4: Forecast spend (£m) by sub-programme

Programme £m (values rounded)	2022/2023	2023/2024
Sub-programme & Asset Groups		
Fleet (including Fleet Heavy Overhaul and Engineering Vehicles)	130.0	159.3
Signals	33.7	36.5
Track	87.0	95.0
Total Programme Forecast	250.7	290.8

- 5.9 Combining the sub-programmes into a single authority gives greater flexibility to manage the Programme and if necessary, respond to any changing priorities within year. There remain robust controls in place to ensure visibility and accountability in decision making. These include assurance reviews and change control with decisions taken in line with delegated authorities. Contractual controls will be used to delay projects if required to remain within budget. No additional Programme and Project Authority in 2022/23 and 2023/24 is requested to that previously approved.
- 5.10 The Programme delivers a blend of repeatable work and overhaul projects. The forecast in Table 7 below, section 8.1, shows financial years to 2027/28 inclusive. This recognises that an increased spend is required to improve SoGR across the Programme.
- 5.11 As explained in section 3 above, both the Fleet Heavy Overhaul and Fleet Renewals require a different approach with a greater uplift in funding required in order to place long-term contracts as a result, this means there will be less available funding for other areas of the Programme, such as Track, which will continue to impact SoGR in some asset groups.
- 5.12 Refinement of the forecast for the coming financial years will take place through the business planning process and be presented in future annual submissions to the Committee. This will be prioritised in accordance with our Asset Strategies. A proportion of future year's spend is already contractually committed. There are

also longer-term contractual commitments that will need to be made in 2024/25 in order to deliver the Asset Strategy. e.g. the Central line Incremental Signalling Upgrade, which will continue to be refined through business planning.

Benefits and value

- 5.13 Asset modelling and historic performance trends have been used to assess the SoGR achieved by the planned investment. Appendix 1 shows a worked example (from a different renewals programme) for Lifts and Escalators as a target for data maturity. This is a priority for the Programme with work continuing to increase data maturity across all asset areas.
- 5.14 Our Financially Constrained scenario will result in deteriorating asset condition and is expected to increase the backlog of renewals that mitigate risk and allow us to maintain the level of service availability. This means whole life costs and best value are unlikely to be achieved as investment will not be at the optimum.

6 Programme risks and milestones

- 6.1 Table 5 below shows top risks associated with delivery of the Programme to address asset resilience and a decline in the SoGR.

Table 5: Top risks for LU Train Systems Programme

Risk No	Risk Description	Mitigation Actions
1	Constrained funding and increasing materials and labour costs impact delivery against objectives. Declining SoGR increases risk of asset failure. Increased risk of asset failures resulting in the programme needing to be re-prioritised in-year	Prioritise projects on whole life cost and risk to ensure best value. Strengthen regular reviews. Develop greater asset health awareness through data collection to prioritise critical assets in line with our Asset Strategies and life extend where possible. Ensure that maintenance and operations are able to react to asset condition changes
2	Lack of attractiveness to supply chain due to smaller contracts let on a case-by-case basis	Review commercial strategy within the duration of available funding
3	Resource levels in planning, delivery, and supporting teams and long lead times impacts delivery	Larger combinations to consolidate work may reduce supply chain uncertainty and make more efficient use of commercial resource. Regular deliverability reviews
4	Access to the network for delivery of works	Early engagement and co-ordination. Aggregate work in delivery to reduce overall disruption and cost
5	Maturity of Asset Strategies is variable. Data may be unreliable or incomplete.	Ongoing development of our Asset Strategies to identify data gaps and address these. Use tacit knowledge whilst Asset data matures

- 6.2 Risk allowances are applied at the project level. The Programme does not include a programme wide risk allowance so increases in costs above known and planned project risk need to be balanced by reductions or deferrals into future

years. This reflects the fact the programme is comprised of hundreds of schemes that, experience has shown, enable risk to be effectively managed across the programme using the workbank approach.

6.3 The strategic milestones for this Programme are shown in Table 6 below.

Table 6: Strategic Milestones Programme Milestones 2022/23

Project	Milestone Description	Date	Status
Track	Install 9km of new Class 2 track by end of Q4	30/04/22	Achieved
Fleet	10 th Metropolitan line train overhauled	16/06/22	Achieved
Fleet	Remote Track Monitoring – Contract award for design and delivery of two new Track Recording Vehicles	24/06/22	Achieved
Fleet	Bakerloo line RVAR – 10 out of 36 trains fitted with LED lighting to comply	30/09/22	30 days later than baseline
Fleet	Central line Improvement Programme – First train into service	26/02/23	On target
Fleet	Central Line Improvement Programme - All design signed off enabling start of full production phase.	29/11/22	Ahead of target
Fleet	Central line Improvement Programme – First train ready for service introduction	31/03/23	On target

7 Commercial Strategy

7.1 The Programme is predominantly delivered by our internal Direct Labour Organisation and by contractors using existing frameworks for rolling renewal interventions.

8 Financial Implications

8.1 The 2021 TfL Budget provides the Financial Authority needed to deliver the scope of the works set out in this request. The Programme's Financial Authority and the Programme and Project Authority is shown in Table 7 below.

Table 7: Summary of the costs and funding

LU Infrastructure Renewals		Actuals	Budget		Forecast				Total
Rounded to £m		Prior Years	22/23	23/24	24/25	25/26	26/27	27/28	
Financial Authority									
Budget		665.7	250.7	290.8	-	-	-	-	1207.2
Programme Forecast									
Forecast		665.7	250.7	290.8	312.5	362.4	372.1	406.8	2661.0
Authority request									
Prog. & Project Authority	Existing Authority	665.7	250.7	290.8	312.5	239.4	28.7	3.2	1791.0
	This request	0	0	0	0	0	0	0	0
	Future requests	0	0	0	0	123.0	343.4	403.6	870.0

Note – All future costs exclude inflation

8.2 A funding agreement is now in place with Government which allows for investment in the Programme to continue at the estimated level for the remainder of this year and 2023/24. It is not expected that additional commitments beyond 2023/24 will be made in this financial year. Any Authority granted which relates to both the current funding period and commitments that extend beyond the period of the Business Plan and Budget may need to be revised as part of future budgets to be considered by the Board.

8.3 Beyond the current agreed budget (to 2023/24), business planning will inform the allocation of funding to ensure that the forecast spend can be achieved. This will be based on the prioritisation of assets and their need in the coming years.

9 Equality and inclusion

9.1 TfL has an obligation under the Equality Act 2010 to:

- (a) eliminate discrimination, harassment, victimisation, and any other conduct that is prohibited by or under the Equality Act 2010;
- (b) advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it; and,
- (c) foster good relations between persons who share a relevant protected characteristic and persons who do not share it.

9.2 Most of the Programme is like-for-like renewals maintaining existing provision. However, with customer facing projects, such as those in fleet, we are taking the opportunity to improve accessibility for customers where possible. There are temporary impacts for customers during the delivery of works which may include a reduction in service provision. Equality Impact Assessments will be completed

on projects as required. A deteriorating SoGR, particularly in fleet, has a higher adverse impact on customers with accessibility needs.

10 Assurance

- 10.1 TfL Project Assurance conducted an Integrated Assurance Review (IAR) on the Programme in September 2022. This was targeted at the Fleet and Track areas and at Train Systems level going forward. Overall there were 12 recommendations by Project Assurance and five by IIPAG. There were two Critical issues raised which are related to the wider asset condition and maintenance plans. These have both been accepted and an action plan put in place to address the issues. These observations and recommendations are all in line with the TfL view of the programme and we are grateful for the support from the additional assurance. Details of these recommendations and our Management Response have been shared with the Committee.
- 10.2 An agreed Integrated Assurance Plan (IAP) for the Programme, covering the next 12 months, has been produced that sets out those projects that are expected to be reviewed. The IAP will be reviewed and updated quarterly.

List of appendices to this paper:

Appendix 1: State of Good Repair

Appendix 2: October 2020/21 – 2022/23 H1 actuals / year end forecast

Appendix 3: 2022/23 budget allocations and outputs

List of Background papers:

TfL Project Assurance Reports

Management response to TfL Project Assurance Reports

Contact Officer: David Rowe, Interim Director of Investment Delivery Planning
Email: davidrowe@tfl.gov.uk

Appendix 1: State of Good Repair

A1.1 SoGR, where possible, is based on industry standard condition measures. SoGR helps inform prioritisation of interventions, although not in isolation (other factors, such as asset criticality, risk, safety, and service are considered alongside SoGR). TfL has mapped these industry measures to a consistent five category scale of asset condition – the condition categories are Very Good, Good, Fair, Poor and Very Poor. The percentage of assets in these categories is used to calculate SoGR, namely:

- SoGR – the sum of the percentages in the Very Good, Good and Fair categories. These assets, in general, do not require planned asset renewal in the next one to three years, although in some instances it does reduce whole life costs to intervene when an asset is in the Fair category.
- Not in a SoGR – the sum of the percentages in the Poor and Very Poor categories. Typically, these assets have a higher probability of failure and should be considered for a renewal within the next one-to-three-year period (subject to assessment through prioritisation processes).

A1.2 The current scorecard target for LU assets differs by asset type.

A1.3 Table 1 below provides examples based on currently measured LU assets

Table 1: State of Good Repair – scorecard targets 2021/22 (*asset included in this Programme)

Asset	SoGR Performance 2021/22	SoGR Target 2021/22/23
Signals*	91%	91%
Escalators	82%	82%
Track*	48%	76%
Lifts	71%	71%
Fleet*	68%	68%

A1.4 Current scorecard targets are set based on an assumption that SoGR should be maintained based on current available investment. All assets are safety managed; where the SoGR is below the preferred range it reflects the need for renewals investment to deliver a reliable network and reduce the risk of restrictions and closures. Safety is maintained through appropriate inspections, minor repairs, and restrictions.

A1.5 SoGR in LU is calculated using a range of methodologies, primarily using data from Asset Condition Reporting. There are however some gaps across LU's asset base limiting our ability to calculate a total SoGR for LU. In these cases, other condition and asset health metrics are used to support prioritisation. Currently SoGR covers the following asset groups in LU; Track, Fleet, Signals, Escalators & Lifts and Buildings (approximately 75 per cent of the LU renewals investment programme). This makes comparison of condition using SoGR alone a challenge. A maturity plan has been developed with the aim of developing the

data to inform a consistent approach to SoGR analysis across all asset areas that make up LU's asset base. Work is ongoing to set targets in the maturity plan for 2022/23.

A1.6 Table 2 below and paragraph A1.7 below shows data currently measured or forecast via modelling for the Lifts and Escalator asset types indicating trends referred to in paragraph 4.2. This gives a mature example of how SOGR is calculated which is the aim for all asset areas across LU as data improves.

Table 2: Current and Predicted State of Good Repair (per cent) – Lifts and Escalators

Asset	19/20	20/21	21/22	22/23	23/24	24/25	25/26
Lifts – SoGR existing asset base	74	73.5	70.7	69.4	68.1	66.9	65.6
Lifts – SOGR revised asset base	-	-	-	71.0	71.4	71.7	72.1
Lift Assets (no)	226	248	259	311	312	313	319
Escalators – SoGR existing asset base	85.6	83.6	82.1	78.8	75.8	72.8	69.8
Escalators – SOGR revised asset base	-	-	-	79.7	77.6	75.5	73.4
Escalator Assets (no)	458	458	463	524	526	526	529

A1.7 The modelling results for Lifts and Escalators reflects investment of £28m in 2022/23 and increased by 15 per cent for following years. For Escalators a declining overall trend is predicated both with and without additional assets to be installed. The position for lifts does show the overall SoGR is influenced by additional assets introduced (e.g. as part of Northern Line extension) in addition to levels of investment. For the existing asset base for Lifts the SoGR is predicted to decline even with the future investment assumed, but the overall SoGR is improved when the new assets are considered. These forecasts will help inform prioritisation of investment decisions for renewals and allow benefits to be monitored against forecasts supported by performance data.

Appendix 2: Delivery since last Committee submission and plan to next submission

Note: Whilst allocations and outputs for the year were part of the submission for the year 2021/22, they were reset by the TfL/DfT funding agreement as outlined in the letter from the DfT on 1 June 2021.

Fleet Heavy Overhaul Programme:

Project and Key Delivery from December 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
<p>Jubilee line fleet:</p> <ul style="list-style-type: none"> Commence pull forward activities and Programme Lift (scheduled heavy maintenance) 	<ul style="list-style-type: none"> Pull forward activities 70% complete. Phase 1 of Programme Lift commenced 	<ul style="list-style-type: none"> Complete Pull forward activities. Complete Phase 1 Programme lift on 26 trains. Commence phases 2 (HVAC [heating and cooling]), 3a (couplers) and 3b (Uncoupler Switches)
<p>District, Circle and Hammersmith & City line fleets:</p> <ul style="list-style-type: none"> Place contracts for programme lift Complete programme lift optimisation review from Metropolitan line programme lift experience. 	<ul style="list-style-type: none"> Procurement activities in progress. 	<ul style="list-style-type: none"> Complete Programme Lift optimisation periodicity extension. Place main contracts for Programme Lift
<p>Victoria line:</p> <ul style="list-style-type: none"> Complete programme lift catch back activities. Complete door overhaul of 22 trains. Complete coupler overhaul of 47 trains. Complete Pressure Ventilation system replacement on 32 trains 	<ul style="list-style-type: none"> Programme Lift catch back activities completed. Forecast to complete phase 1 door overhaul of 20 trains by December 2022 Forecast to complete coupler overhaul of 38 trains by December 2022. On track to complete pressure ventilation system install on 32 trains by December 2022. 	<ul style="list-style-type: none"> Complete phase 1 of door overhaul on all 47 trains and phase 2 overhaul on 10 trains. Complete coupler overhaul on all 47 trains. Complete pressure ventilation system install on all 47 trains. Complete wheelset overhaul on 30 trains.

Project and Key Delivery from December 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
<p>Bakerloo line:</p> <ul style="list-style-type: none"> • Complete new Programme Lift cycle of 24 trains, • Complete new Heavy Overhaul cycle of 9 trains • Complete Door Overhaul of 5 trains. 	<ul style="list-style-type: none"> • Completed 13 units of Programme Lift. • Completed 4 units of heavy overhaul. • Door overhaul delayed (to take advantage of a new improvement opportunity). 	<ul style="list-style-type: none"> • Complete Programme Lift of 24 units. • Complete heavy overhaul of 8 units. • Place all orders for door overhaul.
<p>Metropolitan line fleet:</p> <ul style="list-style-type: none"> • Complete overhaul of all 47 trains 	<ul style="list-style-type: none"> • Completed Programme Lift on 20 trains. 	<ul style="list-style-type: none"> • Complete Programme Lift on 45 trains • Agree scope and place orders for Gangways & Couplers Overhaul. • Place orders for Door Overhaul
<p>Piccadilly line:</p> <ul style="list-style-type: none"> • Complete 8 units of Programme lift • Complete remaining 5 units of seating overhaul • Complete remaining 12 units of Door scope 1 • Commence Door scope 2 works • Remobilise Pneumatic Control Module (PCM) works 	<ul style="list-style-type: none"> • Completed 16 units of Programme Lift. • All seating completed. • Door scope 1 completed. • Packages 7 & 8 of Door scope 2 commenced. • PCM works remobilised (but delivery strategy under review). 	<ul style="list-style-type: none"> • Complete Programme Lift. • Complete flooring overhaul. • Commence new delivery strategy for PCM works. • Commence all packages of Door scope 2. • Commencement of Pressure Switch replacement.
<p>Rail Adhesion Trains (RATs):</p> <ul style="list-style-type: none"> • Complete catch back activities on the two Central line RATs. • Develop overhaul scope for Metropolitan line RAT. 	<ul style="list-style-type: none"> • Catch back activities 30% complete. • Scope and Bill Of Materials drafted. 	<ul style="list-style-type: none"> • Complete catch back activities on Central line RATs • Place all orders for Metropolitan line RAT. • Initiate new project for next cycle of Central line RAT overhaul.

Fleet Programme:

Project and Key Delivery from December 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
<p>CLIP, Programme Lift and New Workshop:</p> <ul style="list-style-type: none"> • AC Traction Infrastructural testing in spring 2022 • Design Sign-off by spring 2022 • First train back to fleet in spring 2022 • Withdrawal of five trains from service from summer 2022 • Seats Repairs 	<ul style="list-style-type: none"> •Static & dynamic testing completed •Withdrawn four trains for CLIP 	<ul style="list-style-type: none"> •First train back into service •Start Programme lift on 1st train •Withdraw five trains for production •AC02 Temporary store for CLIP ramp up •TMU Hand back •Commence Seats Invitation to Tender (ITT)
<p>Bakerloo line RVAR</p> <ul style="list-style-type: none"> • First train installation of LED lighting, Passenger Information System (PIS), wheelchair bays and grab poles • Deliver above and below waist rail components • Commence works on 2nd train by spring 2022 	<ul style="list-style-type: none"> •Returned 1st train into service with all (except PIS) •Commence works on 2nd train and moved workshops into Stonebridge Park •Installed LEDs on 10 out of 36 trains 	<ul style="list-style-type: none"> •Designs sign off •Introduce the first PIS system and return 1st RVAR compliant train into service •Continue to install LEDs on 17 more trains
<p>Train Cab J-Door Security Improvement:</p> <ul style="list-style-type: none"> • Complete Detailed Design on all passenger fleets. • Commence installation on 92TS (Central), 72TS (Bakerloo) & 09TS (Victoria) fleets. 	<ul style="list-style-type: none"> •Works continued on Waterloo & City line fleet •Capital re-prioritisation to defer works on rest of LU fleet 	<ul style="list-style-type: none"> •Complete works on Waterloo & City line fleet
<p>Victoria line passenger fleet:</p> <ul style="list-style-type: none"> • Continue to deliver ventilation and fan cleaning • Complete floor repairs where required 	<p>On track</p>	<p>On track</p>

Project and Key Delivery from December 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
JVUM: <ul style="list-style-type: none"> • Commence procurement for design and manufacture • Develop technical specifications 	<ul style="list-style-type: none"> • Technical specification completed • Signed Procurement Strategy with all ITT documentation completed 	<ul style="list-style-type: none"> • Contract award to develop the design and deliver the solution
Victoria and Jubilee line Obsolescence Management (CCTV, PIS, Train Management System (TMS), and life extension)	<ul style="list-style-type: none"> • Initiated new projects for Victoria and Jubilee lines obsolescence management 	<ul style="list-style-type: none"> • Conduct feasibilities for these new projects
Jubilee line passenger fleet mid-life refurbishment	Closed	Closed
Bakerloo line Life Extension	Closed	Closed
Metropolitan line Rail Adhesion Train	Closed	Closed

Engineering Vehicles (EV) Programme:

Project and Key Delivery from December 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
<p>Locomotive Capability:</p> <ul style="list-style-type: none"> Develop technical requirement specifications for the new fleet Start procurement activities 	<ul style="list-style-type: none"> Project re-characterised as a major and transferred to Major Programme Directorate (Chief Capital Office) 	<p>No further action</p>
<p>EV Overhauls Life extension:</p> <ul style="list-style-type: none"> Overhaul of 6 locomotives, 24 wagons, deep tube cranes, and tamping machines 	<ul style="list-style-type: none"> Procured drawgears and cab refurbishment designs for locomotive overhauls; develop bogie repair specs Returned 2 overhauled wagons and 1 deep tube crane into service Specifications for tamper overhauls on track 	<ul style="list-style-type: none"> Overhaul 3 locomotives Commence works on one Matisa and one Plasser unit
<p>Remote Track Monitoring (RTM/TRV):</p> <ul style="list-style-type: none"> Contract award for the track geometry equipment and progress concept design Close out of TRV SSL (Sub surface lines) project 	<ul style="list-style-type: none"> Awarded contract for the RTM solution Close out of TRV SSL delayed as the vehicle needed Programme Lift 	<ul style="list-style-type: none"> Sign off concept designs for the TRV replacement Commission TRV SSL project and extend concession to operate on other suitable lines
<p>Mechanised Renewals Vehicle (MRV)</p> <ul style="list-style-type: none"> Initiate MRV enhanced phase 2 to add functionality and reduce manual handling on site and in the depot 	<ul style="list-style-type: none"> Certified MRV modifications for use by Track Delivery Unit (TDU) Completion of Phase 1 delayed due to non-availability of suitable on-site trials 	<ul style="list-style-type: none"> Close out MRV Phase 1 and draft technical requirements for Phase 2
<p>Engineers Vehicle Depot Enabling – Ruislip:</p> <ul style="list-style-type: none"> Complete feasibility study for a parallel stabling track for the new wagons Conduct familiarisation for Modular Points and Crossings equipment (Mod P&C) and supply welfare facilities for Operations and Maintenance (O&M) 	<ul style="list-style-type: none"> Delivered required stabling track for the new wagons Procurement for new Mod P&C welfare facilities for O&M in progress Commissioned civil works to replace the storage space for rail materials 	<ul style="list-style-type: none"> Install lighting for the new tracks Complete familiarisation for Mod P&C

Project and Key Delivery from December 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
Mod P&C: <ul style="list-style-type: none"> Obtain certification to work on LU Sub-surface network (open section) and Ruislip depot for track renewals. 	<ul style="list-style-type: none"> Achieved certification to operate in Ruislip Depot and open sections on the Sub-surface railway 	<ul style="list-style-type: none"> Roll out on-site trials for track renewals Confirm assurance requirements for tunnel sections on the SSL
New Wagons: <ul style="list-style-type: none"> Commence mass production of remaining wagons 	<ul style="list-style-type: none"> Received the fifth rectified wagon Completed bogie structure static testing 	<ul style="list-style-type: none"> Re-planning of dynamic testing on the Network Rail (NR) and LU network Commence mass production of wagon bogies only
Ward Coupler Modifications: <ul style="list-style-type: none"> Start concept design phase 	Re-start a round of commercial exercise to procure a design and manufacture of coupling solution	Complete concept and detailed designs for the ward coupler modifications

Signalling and Control (S&C):

Project and Key Delivery from October 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
Central line S&C life extension. Detailed Design Early deliverables CONNECT telecommunication works	<ul style="list-style-type: none"> Detailed designs commenced for work packages 1-5 and 9 CONNECT works finished on site 	<ul style="list-style-type: none"> Detailed design commencement for packages 7 and 8 Commencement of site installation works
Northumberland Park depot S&C upgrades. Completion of point detection equipment replacement Detailed design commencement	<ul style="list-style-type: none"> The project has re-entered concept design following a change of direction Two point detection replacements to complete (require closure) 	<ul style="list-style-type: none"> Concept design completed Tendering in progress for control system and new Train Movements Complex All point detection replacement completed
Northern and Jubilee lines S&C obsolescence management	<ul style="list-style-type: none"> Detailed design complete 	<ul style="list-style-type: none"> Delivery of system Project close

Project and Key Delivery from October 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
Large Data Transfer system upgrade		
<p>Piccadilly line signalling life extension / Asset Condition Works</p> <p>Contract award replacement capacitors</p>	<ul style="list-style-type: none"> •Contract awarded, production has commenced however delays have occurred due to materials shortages 	<ul style="list-style-type: none"> •All capacitors suspected of containing hazardous chemicals replaced • Four Lines Modernisation (4LM) residual capacitors replaced (if required)
<p>Bakerloo incremental upgrade</p> <p>Start of concept design works on Bakerloo</p>	<ul style="list-style-type: none"> •The concept design for all sites have been completed •Detailed design completed for site works at six sites •Site enabling works have been completed at five sites 	<ul style="list-style-type: none"> •All site enabling works completed •Detailed design for control centre completed •Detailed design for back up control completed
<p>Central incremental upgrade</p> <p>Early market engagement for market interest option selection</p>	<ul style="list-style-type: none"> •High level options development report completed •High level scope documents produced for the procurement strategy. •Technical engagement commenced for Wayside East. 	<ul style="list-style-type: none"> •Enabling works information and main works information completed in advance of tendering.
<p>Northern and Jubilee incremental upgrade</p> <p>Completion of option selection Engineering Vehicle (EV) Train Operator Display (TOD) optioneering completed Contract award for replacement of Vehicle Control Centres [central computers]) VCCs on Northern line and TODs replacement on Jubilee & Northern lines</p>	<ul style="list-style-type: none"> •Option selection completed •Contract awarded to VCC works. 	<ul style="list-style-type: none"> •Detailed design complete for TODs

Project and Key Delivery from October 2021 to December 2022	Status at October 22	Planned Oct 22 – Oct 23
<p>New projects arising from the Asset Condition Register</p> <p>Platform Edge Door (PED) overhaul District line PCBs removal Piccadilly line wire degradation Bakerloo line track circuit obsolescence</p>	<ul style="list-style-type: none"> •Projects initiated 	<ul style="list-style-type: none"> •Acton Town wire degradation works completed •PED overhaul commenced design

Track:

Intervention		2022/23 Forecast at last submission	2022/23 Forecast at October 2022	2023/24 Forecast as of October 2022
Plain-line (metres)	Deep Tube Renewals (DTR)	4,754	1760	1760
	Ballasted Track Renewals (BTR)	4,522	148	1500
	Flat Bottomed rail Conversion	10,000	6300	6600
P&C (units)	P&C full renewal + heavy maintenance activity	12	5	7
Other	Track Drainage (m)	3,000	655	1000
	Long Timber Bridges (units)	2	2	0

Appendix 3: 2022/23 planned scope

Notes

- 1) This provides an overview of the Train Systems renewals portfolio for 2022/23
- 2) This list will be subject to change as deliverability and priorities continue to be assessed
- 3) Includes additional scope to progressed if funding becomes available.

Sub-Programme	Programme/Project	2022/23 Cost (£m)	Description
Signals	Central Line signalling and control life extension	22.3	Replacement of obsolete components within the signalling and control systems
Signals	Signals essential projects	3.0	High priority safety projects to be addressed including legislative removal of components containing hazardous chemicals
Signals	Incremental Upgrade Programme	11.4	Incremental system upgrades in tranches to remove obsolescence and improve reliability for four lines (Bakerloo, Central, Jubilee and Northern)
Signals	Northumberland Park Depot control system renewal	0.6	Replacement of the 1960s control system which allows movement of train around the depot
Fleet	Heavy overhaul	81.0	Heavy overhaul of fleets as required. This is applicable to all fleets at specified points during their life according to distance moved.
Fleet Renewals	Central Line Improvement Programme,	22.4	Replacement of seats, introduction of measures to meet accessibility regulations including the introduction of LED lighting and the overhaul of the trains
Fleet Renewals	Jubilee Line Fractures (JVUM)	1.0	Weld repair of known train defects
Fleet Renewals	Bakerloo Line RVAR	4.4	Introduction of measures to meet accessibility regulations, including the introduction of LED lighting

Fleet Renewals	Victoria Line 09TS Vent & Ducting	0.4	Re-design of ventilation system to improve passenger conditions
Fleet Renewals	Initiating New Fleet Renewals Projects	0.3	Scoping of new projects
Fleet Renewals	J-Doors security improvements	0.4	Locking systems to be fitted to all driver's cabs - prototyping
Track	Integrated Track Team (ITT)	31.3	Ballasted track and points & crossing renewals
Track	Track Delivery Unit (TDU)	39.8	Deep tube renewals and flat bottom conversions
Track	Life Extension Projects	16.3	Projects that extend the asset life but aren't full renewals
Track	Other	1.1	Misc. costs
EV	EV renewal programme	15.0	Overhaul of tamping machines, track renewal vehicles, wagons and supporting works

Programmes and Investment Committee



Date: 19 October 2022

Title: Docklands Light Railway Rolling Stock Replacement Programme

This paper will be considered in public

1 Summary

	Existing Financial Authority ³ (£m)	Estimated Final Cost (EFC) (£m)	Existing Programme and Project Authority (£m)	Additional Authority Requested (£m)	Total Authority (£m)
Base ¹	461.1	619.5	602.8	16.7	619.5
HIF ²	60.4	281.0	281.0	0	281.0
Total	521.5	900.5	883.8	16.7	900.5

Table 1: Summary of Authority Request

¹the base programme includes £7.3m of costs which are funded through other third-party contributions.

²The Housing Infrastructure Fund (HIF) Programme is funded through a Grant Determination Agreement (GDA) with the Department for Levelling Up, Housing and Communities (DLUHC). This includes a funding contribution towards the cost of enabling works to support a proposed property development at the Docklands Light Railway (DLR) Poplar depot. This is not covered in this paper but will be covered in a separate update to the Land and Property Committee in 2023.

³ Financial Authority is provided through the two-year Budget for 2022/23 and 2023/24, approved by the Board in March 2022. The existing authority includes commitments that extend beyond the period of the Business Plan and Budget.

1.1 The purpose of this paper is to update the Committee on the DLR Rolling Stock Replacement Programme (RSRP). This includes developments since the previous submissions to the Committee in October 2020 and July 2021. Since our previous updates to the Committee, we have made substantial progress on the scheme, including:

- (a) completing the manufacture of the first four new trains and commencing dynamic testing of trains one and two on the manufacturers test track in Spain;
- (b) progressing significant design packages for the new depot, supporting infrastructure and associated network upgrades for the new trains;

- (c) continued engagement with DLUHC for HIF support, satisfying the initial conditions of the GDA which became unconditional in July 2021;
 - (d) completing the purchase of land to the south of the existing Beckton Depot, which will accommodate the new HIF-funded sidings, and submitting a planning application for the HIF-funded sidings;
 - (e) continuing the construction of the new northern sidings at Beckton Depot, which we expect to bring into use early in 2023;
 - (f) developing train delivery and deployment strategies, working closely with our suppliers and the operator of the DLR (Keolis Amey Docklands (KAD)); and
 - (g) progressing the procurement process for the new train Maintenance Facility Building (MFB), Southern Sidings, and Temporary Fit Out Shed (TFOS), with tenders returned and evaluated during the summer of 2022.
- 1.2 We have managed significant pressures across the programme to date, including the impacts of the coronavirus pandemic, without any increases to the Estimated Final Cost (EFC). Since early 2022, however, we have faced further cost pressures, primarily driven by inflation. While we have taken, and continue to seek, opportunities to manage these pressures, we have been unable to fully offset increased costs and so we now require additional Programme and Project Authority.
- 1.3 This paper, and accompanying paper on Part 2 of the agenda, explain the steps we are taking to offset and mitigate cost pressures. Recognising TfL's overall capital funding envelope, confirmed in the 30 August 2022 funding agreement with government, we will seek funding for any remaining unbudgeted amounts within the programme through our ongoing processes to identify capital efficiencies and prioritise our investment programme in line with strategic objectives. This will be confirmed through the upcoming Business Plan and Revised Budget for 2022/23.
- 1.4 The paper on Part 2 of the agenda contains exempt supplementary information. The information is exempt from publication by paragraph 3 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the business affairs of TfL. Any discussion of that exempt information must take place after the press and public have been excluded from the meeting.

2 Recommendations

2.1 The Committee is asked to note the paper, and the related paper on part 2 of the agenda, and:

- (a) approve additional Programme and Project Authority of £16.7m, resulting in total Programme and Project Authority of £900.5m; and**
- (b) note that Procurement Authority for the Maintenance Facility Building and associated depot works will be sought at officer level in accordance with Standing Orders.**

3 Background and Strategic Context

- 3.1 The strategic driver for the RSRP is to continue offering a quality public transport experience to existing and growing communities in London, in line with the objectives of the Mayor's Transport Strategy.
- 3.2 A significant portion of the existing DLR fleet, the B90/92 stock, has reached the end of its design life. This presents significant challenges to sustaining reliable service performance for our customers, with the Mean Distance Between Service Affecting Failures continuing to reduce.
- 3.3 While options were explored to "patch and repair" or "life-extend" these trains, our previous work demonstrated the significant value, revenue generation, and whole-life cost savings resulting from a fleet replacement.
- 3.4 Despite some customers switching to the Elizabeth line, the DLR has seen a stronger recovery from the coronavirus pandemic compared to the wider rail network. We therefore introduced timetable changes on 26 September 2022 to support this increasing demand which demonstrates the need to continue prioritising a reliable service on the DLR, and to address capacity issues across the network. Passenger numbers continue to grow, with the number of journeys exceeding our budget forecast by eight per cent in period 6 of 2022/23.
- 3.5 The DLR also runs through areas of London that are expected to accommodate significant growth in housing and employment in the coming years, including major Opportunity Areas in the Isle of Dogs/South Poplar, and the Royal Docks. This growth is forecast to result in significant additional demand across the DLR network, exacerbating existing and creating new capacity issues.
- 3.6 Through the RSRP, we are delivering a new fleet of trains and associated infrastructure improvements, including expansion of the existing Beckton Depot. The new walk-through, air-conditioned trains will improve reliability, provide greater capacity, and offer an improved customer experience. We will also expand the fleet, replacing the equivalent of 33 life-expired trains with a total of 43 new trains, allowing significant capacity uplifts across the network.
- 3.7 We are also working with the Greater London Authority (GLA) and DLUHC to deliver an additional 11 trains and associated infrastructure funded by the HIF. This gives a total of 54 new trains providing even greater capacity uplift and supporting further housing growth across the DLR network.
- 3.8 Following approval by the Committee of Programme and Project Authority and Procurement Authority for the RSRP, on 11 December 2018, Docklands Light Railway Limited (DLRL) entered into a manufacture and supply agreement (MSA) and a fleet support agreement with Construcciones y Auxiliar de Ferrocarriles S.A. (CAF) on 11 June 2019 for the design, manufacture and supply of 43 new trains, including the provision of fleet technical support services and spares supply for 35 years. The status of the additional 11 HIF-funded new trains is explained further below.

- 3.9 At this time, DLRL also entered into a supplemental agreement with Thales Transport and Security Limited and Thales Canada Inc. to support the signalling requirements for the new fleet, as well as letting a number of design and construction contracts for the additional sidings and maintenance facilities at Beckton depot.
- 3.10 As part of our “Safe Stop” in March 2020, we paused all depot and infrastructure works. In response to the financial uncertainty resulting from the coronavirus pandemic, we continued to pause all depot and infrastructure works until late 2020 to enable the programme to fit within the available budget envelope, with around 60 per cent of the project team placed on furlough. With remobilisation, this resulted in a significant delay on depot and infrastructure projects.
- 3.11 We did not pause works on the rolling stock manufacture with CAF and associated activities. This decision was based on a number of factors, the most significant of which was the likely significant prolongation costs.
- 3.12 While significant challenges remain with signalling (as set out further below), we have subsequently made good progress with the manufacture of the new trains, with rolling stock moving off the critical path, which now runs through the depot and infrastructure works which are behind the original schedule.
- 3.13 We have therefore been developing contingency plans to allow early assembly and testing of the new trains, prior to completion of the relevant depot works; previously we planned to assemble trains in the new MFB. The goal has been to ensure the trains are delivered to plan and to enter into service on time to deliver the scheme’s benefits, including revenue uplifts, as soon as practical. These plans are further discussed in section 5 below.

4 Rolling Stock

- 4.1 Through CAF, we completed manufacture and static testing of the first train three months ahead of programme, and have now completed manufacture of the first four trains. We expect to complete manufacture of 12 trains by the end of the financial year.
- 4.2 The first two trains commenced dynamic testing on the manufacturer’s test track in Spain three months ahead of programme. This involves type tests of the onboard systems followed by 20,000km fault free endurance testing to prove reliability. This testing is forecast to conclude by the end of 2022 and the trains will then be delivered to the UK for network testing.
- 4.3 There have been some issues with the integration of the Thales on board signalling software which have been successfully mitigated to date. Significant risk remains in this area of the programme, however, with limited remaining mitigations and so this remains a key area of focus for the RSRP.

5 Beckton Depot

- 5.1 The scope of works at Beckton Depot is now split into a number of packages as set out below. We selected a Managed Package Solution as the preferred procurement route for the depot works. This sees a series of sequential contracts being let for the build of the various packages while we retain responsibility for overall systems integration.
- 5.2 Overall, the depot works are currently 10 months behind our original schedule due to the impacts of the pandemic, and other technical and delivery challenges which are summarised below and in the paper on Part 2 of the agenda.

Northern Sidings

- 5.3 The expanded Northern Sidings will deliver a new test track, train wash, stabling capacity and an Automated Train Scanning System for the new fleet, enable some existing sidings to be removed to allow construction of the new MFB, as well as expanding and migrating the signalling system to a new control unit.
- 5.4 Works are now progressing on site and this year we have decommissioned the existing test track and sidings “D, E & F” which required complex signalling migration over a series of weekend closures.
- 5.5 We expect the Northern Sidings will be brought into use in early 2023 but have faced significant delays to date due to the pause in site works caused by the pandemic, delays in the specification of the signalling scope and issues implementing the new signalling solution on the legacy system. These issues have now been resolved and lessons learnt have been incorporated in our strategy for forward delivery of the remaining depot works.

Maintenance Facility Building (MFB)

- 5.6 A new four road MFB will be the primary facility for maintaining the new fleet. We have experienced delay in the remobilisation of the design contract following the pause in works in response to the coronavirus pandemic, and subsequent supplier performance issues in progressing the revised programme. The design is now complete and we plan to imminently award the build contract.

Temporary Fit Out Shed (TFOS)

- 5.7 To mitigate the effect of the delays to the Northern Sidings construction and MFB design on overall train delivery, we have developed a plan for a TFOS. Our decision to progress this work was driven by analysis which demonstrated that the cost of slowing the train contract, or other alternatives, would exceed the cost of constructing the TFOS by between three to six times. Slowing the train contract would also delay the overall programme and delivery of the programme benefits. We are progressing the design of the TFOS which we plan to construct on the land purchased for the HIF-funded sidings and would allow us to receive and assemble trains in line with the original programme.

Southern Sidings

- 5.8 The Southern Sidings will provide further additional stabling capacity at Beckton depot, supporting deployment of the new fleet. The design of these sidings is now complete and we plan to imminently award the contract for construction.

Substation Expansion

- 5.9 Expansion of the substation will provide two new higher rated transformer rectifiers to power the expanded fleet and provide new low voltage power supplies to the expanded depot. Substation works are currently on site with the expanded substation expected to be in service by summer 2023, although a risk to this is discussed further in the paper on Part 2 of the agenda.

Planned Contracts and Cost Pressures

- 5.10 The build of the MFB has been packaged for procurement with the build of the TFOS and the Southern Sidings. Tenders have been returned and evaluation is complete. Costs for these packages are now higher than originally expected, primarily driven by inflation with significant increases in material prices.
- 5.11 The paper on Part 2 of the agenda explains in further detail the driver for these price increases, how we are seeking to mitigate them, and how we have or otherwise offset cost increases across the RSRP. It also explores the alternative options considered and demonstrates why we are seeking additional authority at this time in order to award the depot contract and secure the overall delivery plan.
- 5.12 Subject to the approval of the Committee, we plan to award the contract for the MFB and associated depot works in November 2022, and appropriate Procurement Authority will be sought in line with standing orders.

6 Signalling and Telecoms

- 6.1 Our signalling and telecoms project will update the Thales Automatic Train Operation signalling system enabling it to communicate with the new Thales Vehicle Onboard Controller on the new train and allow for improved functionality.
- 6.2 Detailed design was completed in 2021 and software development is nearing completion. The new software is scheduled to be deployed for testing on the DLR later in 2022. It will first be tested on the existing trains in possessions before testing with the new train commences in 2023.
- 6.3 We are also progressing works to provide new control centre equipment and software integration required to enable the use of the new train onboard systems. The new onboard systems represent a step change from current DLR systems with remote condition monitoring of the train facilitating more efficient maintenance, on-demand CCTV from the train viewable in the control centre, digital advertising, and modern customer information systems and announcements enhancing the customer experience.

6.4 Feasibility work has been completed for these works, and tender documentation is being prepared for their implementation, which we expect to issue later in 2022.

7 Network Infrastructure

7.1 We are also delivering other infrastructure works across the DLR network to support the RSRP, including:

- (a) **Blackwall Station Second Entrance.** To achieve fire evacuation compliance at Blackwall station resulting from the increased capacity of the new trains, a secondary means of escape is required. Alongside this we are seeking an opportunity to use £2m of section 106 funding from the London Borough of Tower Hamlets to increase non-emergency access through a second station entrance. Concept design was completed in May 2022 and a tender for the design and build of the new entrance has been issued, with the contract planned for award later in 2022. Works are forecast to complete in 2024 prior to the introduction of new trains on this part of the DLR network;
- (b) **Power Upgrade.** We awarded a contract to UK Power Networks for the provision of an increased power supply to Beckton Depot in 2019. A new feed will be run from Axe Street substation in Barking to Beckton Depot. Works have progressed on site with ducting in the roadways nearing completion; and
- (c) **Power Resilience.** This involves works to install additional negative reinforcement cables to ensure network performance is not impacted by the increased power draw of the new train. Feasibility work is complete on the negative reinforcement works and a tender for the design and build of these works was issued in August 2022.

8 Housing Infrastructure Fund (HIF)

- 8.1 The HIF-funded works will provide an additional eleven trains and sidings infrastructure to the south of Beckton Depot, along with other works across the network to accommodate the additional trains.
- 8.2 We signed the GDA with DLUHC in December 2020 and provided a further update to the Committee covering the HIF programme in July 2021. Following the approvals granted by the Committee, the GDA became unconditional in July 2021.
- 8.3 Since then, we have purchased land to the south of Beckton Depot from National Grid that will be the site of the additional sidings, completed a design for these sidings and submitted a planning application to the London Borough of Newham. Planning approval is expected before the end of 2022.
- 8.4 We have submitted a number of claims to DLUHC, having satisfied the conditions for those claims. To date, however, DLUHC have only paid claims for “infrastructure”, including purchase of the land and other supporting infrastructure works at Beckton depot.

- 8.5 DLUHC have not yet paid any of our submitted claims in respect of the rolling stock, and so we have not yet exercised our option with CAF to purchase the additional 11 trains. While this presents limited immediate financial risks to TfL as costs are recoverable from DLUHC, this presents significant challenges for programme delivery and threatens planned housing delivery, particularly in the Royal Docks where we are having to inform developers of capacity constraints on the DLR network which might require conditions limiting development. The matter is discussed further in the paper on Part 2 of the agenda.
- 8.6 Once we receive clarity on the additional trains option, we plan to undertake a further update to our Programme Stage Gate B to fully integrate the HIF-funded scope with the base scope and manage this as a single programme - RSRP.

9 Programme Summary

- 9.1 Key upcoming and significant programme milestones are:

Award depot construction contract	November 2022
Northern sidings bringing into use	Early 2023
First train delivered to UK for testing	Early 2023
First train enters passenger service	Early 2024
All trains in service	2026

10 Programme Assurance

- 10.1 In support of this submission, an integrated assurance review was undertaken by TfL Project Assurance and supported by an External Expert and the Independent Investment Programme Advisory Group. This did not identify any critical issues with the programme and we are actively responding to the recommended actions.

List of appendices to this report:

Appendix 1: images of new train at manufacturer's facility, and northern sidings under construction

Exempt supplementary information is included in a paper on Part 2 of the agenda.

List of Background Papers:

Project Assurance and IIPAG Reports

Contact Officer: Stuart Harvey, Chief Capital Officer
 Email: StuartHarvey@tfl.gov.uk

Contact Officer: David Rowe, Interim Director of Investment Delivery Planning
 Email: DavidRowe@tfl.gov.uk

Appendix 1 – images of new train (top), northern sidings construction (bottom)



[page left intentionally blank]

Programmes and Investment Committee



Date: 19 October 2022

Item: Members' Suggestions for Future Discussion Items

This paper will be considered in public

1 Summary

- 1.1 This paper presents the current forward plan for the Committee and explains how this is put together. Members are invited to suggest additional future discussion items for the forward plan. Members are also invited to suggest items for future informal briefings.

2 Recommendation

- 2.1 **The Committee is asked to note the forward plan and is invited to raise any suggestions for future discussion items for the forward plan and for informal briefings.**

3 Forward Plan Development

- 3.1 The Board and its Committees and Panels have forward plans. The content of the plan arises from a number of sources:
- (a) Standing items for each meeting: Minutes; Matters Arising and Actions List; and any regular quarterly or periodic reports. For this Committee, this is the quarterly Investment Programme Report.
 - (b) Programmes and Projects at a level requiring Committee approval. These include the annual review of the sub-programmes in the Investment Programme and other approvals sought following advice from the operating businesses.
 - (c) Items requested by Members: The Deputy Chair of TfL and the Chair of this Committee will regularly review the forward plan and may suggest items. Other items will arise out of actions from previous meetings (including meetings of the Board or other Committees and Panels) and any issues suggested under this agenda item.

4 Current Plan

- 4.1 The current plan is attached as Appendix 1. Like all plans, it is a snapshot in time and items may be added, removed or deferred to a later date.

List of appendices to this report:

Appendix 1: Programmes and Investment Committee Forward Plan 2022/23

List of Background Papers:

None

Contact Officer: Howard Carter, General Counsel

Email: HowardCarter@tfl.gov.uk

Programmes and Investment Committee Forward Plan 2022/23

Membership: Ben Story (Chair), Dr Nelson Ogunshakin OBE (Vice Chair), Seb Dance, Julian Bell, Dr Lynn Sloman MBE and Peter Strachan.

Government Special Representative: Becky Wood

Abbreviations: CCO (Chief Capital Officer), CCSO (Chief Customer and Strategy Officer), CFO (Chief Finance Officer), COO (Chief Operating Officer), D IDP (Director Investment Delivery Planning)

Standing Items		
Use of Delegated Authority	General Counsel	Standing item
Quarterly Investment Programme Report	D IPD and CCO	To note high-level progress updates of the Investment Programme and Major Project items and any specific approvals required in relation to programmes not on the deep-dive list for that meeting.
Independent Investment Programme Advisory Group Quarterly Report	General Counsel	Standing item
TfL Project Assurance	General Counsel	Standing item
Regular programme annual reviews		

14 December 2022		
London Underground Enhancements	D IDP	Update and approval
London Underground Train Systems	D IDP	Update and approval
London Underground Major Stations	D IDP	Update and approval – inc E&C

1 March 2023

London Underground Technology Programme

D IDP

Items to be scheduled:

- London Overground future planning
- Rotherhithe Tunnel
- Fiveways Corner in Croydon
- Lessons Learnt from Complex Projects with Commercial Issues (CCO)
- Enterprise Risk Update - Delivery of key projects and programmes (ER8) (CCO)

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

Document is Restricted

[page left intentionally blank]

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A
of the Local Government Act 1972.

Document is Restricted

[page left intentionally blank]

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A
of the Local Government Act 1972.

Document is Restricted

[page left intentionally blank]

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A
of the Local Government Act 1972.

Document is Restricted

[page left intentionally blank]

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

Document is Restricted

[page left intentionally blank]

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

Document is Restricted

[page left intentionally blank]