Programmes and Investment Committee

Date: **28 February 2024**

Title: **Technology Programme**

This paper will be considered in public

1 Summary

	Technology Programme				
	Existing Financial Authority (2024/25 to 2025/26)	Forecast Spend (2024/25 to 2025/26)	Existing Programme and Project Authority (2022/23 to 2025/26)	Additional Programme and Project Authority Requested including commitments beyond 2025/26	Total Programme and Project Authority
Total Expenditure	842	848	865	227	1,092
Income	(11)	(12)	(28)	16	(12)
Net	831	836	837	243	1,080

Table 1: Summary of Technology Programme's Financial and Programme and Project Authorities (All figures in £m)

1.1 This submission for the Technology Programme (the Programme) brings together the former Technology and Data (T&D), Surface Technology, and London Underground (LU) Technology programmes following the restructure of Programmes within the remit of the Committee in May 2023. In July 2023, Surface Technology and LU Technology were combined to form Operations Technology (OpsTech).

1.2 The focus of this paper is to:

(a) set out the background of the Programme;

(b) provide an update on progress of the merger of the T&D and OpsTech activity;

(c) summarise progress of project delivery and successes since the previous submissions to the Committee in March 2023 for T&D and July 2023 for OpsTech;

(d) summarise the planned delivery for 2024/25 and 2025/26 as well as key challenges and opportunities for the year ahead; and

(e)   request an additional £227m Programme and Project Authority for planned investment priorities in 2024/25 and 2025/26 as well as commitments that span into future years (from 2026/27) that need to be made before the next planned submission to the Committee in March 2025. See Table 3 and Appendix 1 for further information.

1.3   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 and contractors. Any discussion of that exempt information must take place after the press and public have been excluded from this meeting.

2   Recommendations

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

(a)   **approve an increase in Programme and Project Authority of £227m for the Technology Programme giving a total of £1,092m Programme and Project Authority;**

(b)   **note that matters for which Programme and Project Authority is sought above include commitments that extend beyond the period of the 2024/25 Budget and 2024 Business Plan. Provision will, therefore, need to be made for those commitments in future Budgets and Business Plans; and**

(c)   **note that Procurement Authority for the various initiatives will be sought at officer level in accordance with Standing Orders.**

3   Background

3.1   This section describes what the Programme has delivered over the last 12 months, how we have addressed the ongoing challenges to delivery, and how we have supported TfL customers and our colleagues across the business.

Technology underpins everything that TfL does and is integral to securing its future business

3.2   The Programme includes providing core Information Technology (IT) and Operations Technology (OT) services, delivering and maintaining the digital workplace, ensuring transport operations retain the technology capabilities required to operate safely and efficiently, helping TfL become financially sustainable through the support of our payments systems, and protecting the business from cyber-attacks. A significant proportion of our investment is committed to renewals, ensuring our assets stay operational and that TfL services are available and secure.

We used last year's authority to continue to deliver value across TfL and for its customers

3.3   Over the last 12 months, we have invested in future proofing our payments infrastructure (Projects Hina and Proteus), ensuring our operations are safe with upgrades to Passenger Help Points at 15 LU stations, rolling out Body Worn Video (BWV) cameras and Emergency Communication Devices (ECD) to customer facing colleagues, and upgrading our end-of-life wi-fi infrastructure across our estate. Further detail of our delivery over the last 12 months is provided in Appendix 2.

We have also delivered value to colleagues and customers outside of the Programme and across London

3.4   Over the last 12 months, we have delivered several projects from within combined and hybrid delivery teams. For example, in partnership with our supplier, we have increased access to high-speed 4G and 5G-ready connectivity on the underground. We are also delivering the expansion of contactless Pay As You Go (PAYG) beyond London and across the south east, through a Department for Transport funded project.

T&D and OpsTech are merging to create the Technology Programme, enabling greater oversight and flexibility in how we deliver value to TfL and invest in the future

3.5   We welcomed the recommendation by the Independent Investment Programme Advisory Group (IIPAG) that technology investment across TfL should be consolidated into one, business-wide Programme to enable greater efficiency and co-ordination of planning and delivery.

3.6   In May 2023, the Committee approved the establishment of a single Technology Programme as part of a wider set of changes to improve how our Investment Plan is structured. Since then, progress has been made towards establishing the combined Technology Programme in governance, combining management meetings, and consolidating information for ease of reporting and escalation.

3.7   To enable better outcome-based planning, prioritisation, and visibility across the OpsTech elements of the Programme, six theme-based groups of projects have been developed: (1) Connectivity; (2) Cycling and Micro-Mobility; (3) Digital Asset Management; (4) Enforcement, Compliance, Safety and Security ; (5) Network and Public Transport Management; and (6) Tools for Planning, Automation and Staff.

3.8   The merging of T&D and OpsTech into the Technology Programme is at an early stage and ongoing work is being undertaken to ensure that the benefits outlines in section 3.5 can be realised for TfL. This submission to the Committee is a significant early step on the journey to combining the two areas.

4   Programme Delivery Performance During 2023/24

4.1   This section highlights the Programme's delivery performance over 2023/24, the challenges we faced, and how we addressed them.

Our Delivery Performance and Key Achievements

4.2   In the 2023 submissions to the Committee, the former T&D and OpsTech programmes set out key project deliverables for the financial year. The below list highlights some of the key achievements and benefits that have been realised:

(a)   we deployed SAP Ariba, our new supplier and contract management system, providing around 5,000 colleagues with one common platform and dataset for procurement and commercial, improving the way purchases are executed;

(b)   we updated our colleagues' desktop experience, providing a simplified, consistent, people-focussed experience – optimised for hybrid working. This new platform supports continuous, iterative and rapid change, minimising business disruption, and reducing the support/administration resource requirements for delivery and maintenance;

(c)   we deployed Multifactor Authentication across our online platforms, helping safeguard TfL customers and colleagues against personal data breaches and shielding our organisation from any accompanying Information Commissioner's Office fines;

(d)   we delivered a range of upgrades to our TfL Go app including the integration of full bus routes and enhanced disruption information for our customers. We have also made progress on integrating Oyster and contactless payment functionality and delivering push notifications. New functionality continues to drive TfL Go growth with five million downloads so far and 837,000 users in January 2024;

(e)   we delivered replacement Connect radio hardware base units at 295 sites by July 2023, ahead of schedule, ensuring we can deliver improved radio network connectivity for colleagues working across LU;

(f)   we upgraded the passenger communication system for the London Cable Car, delivering improved network connectivity to enable safe operation and an enhanced customer experience;

(g)   we plan to award a new contract in February 2024 which will deliver essential upgrades to the current iBus system including assets and continuation of service;

(h)   we launched the new Common Operational View Incident Management System in June 2023 which provides colleagues in the Network Management Control Centre with a single, more efficient interface for managing incidents and planned works;

(i)   we completed Phase 2 of the Cycle Hire Modernisation programme, including bug fixes and enabling customers to hire multiple bikes using the app; and

(j)   through coverage on the Jubilee, Central, and Northern lines, our Telecoms Commercialisation Project has now provided 4G and 5G mobile coverage to 25 per cent of the LU. We have also hit the key milestone

providing 4G mobile coverage on the first four central London stations on the Elizabeth line. This increased connectivity allows customers to get the latest travel information, access social media, check their emails, make calls, and stream videos while passing through these stations.

4.3   A more detailed list of achievements and associated benefits realised is provided in Appendix 2.

Review of Financial Performance

4.4   In March 2023, £158.7m Programme and Project Authority was approved by the Committee for T&D for financial year 2023/24 and we are forecasted to spend £125.9m by the end of the financial year.

In July 2023, £107.4m Programme and Project Authority was approved by the Committee for OpsTech for financial year 2023/24 and we are forecasted to spend £82.7m by the end of the financial year.

4.5   There have been several delivery and financial forecasting challenges in 2023/24 which have resulted in underspend for both T&D and OpsTech, shown in more detail in Appendix 4. Key causes of the underspend include optimism bias in forecasting, particularly in risk management. This is being actively addressed with deliverability reviews undertaken across the Programme to review 2024/25 forecasts. In addition, supply chain resourcing is impacting the number of projects and the pace at which they can be delivered, particularly commercial resources that were required for projects with contractual elements.

4.6   The Programme conducts periodic reviews of actual performance versus last year's submission expectation as shown in Table 2. Since the last submissions to the Committee, there have been some changes to estimated final costs (EFCs), details of which are provided in appendix 3 and in the related paper on Part 2 of the agenda.

	Programme and Project Authority requested in 2023/24	2023/24 Period 9 Actuals and Forecast Spend	Difference
T&D	158.72	125.86	32.86
OpsTech	107.35	82.65	24.70
Total Programme	**266.07**	**208.51**	**57.56**

Table 2: 2023/24 Summary of Forecast Spend against Budget (£m)

4.7   To reduce the prospect of underspend in 2024/25, we have identified additional projects valued at £75.8m (£33.8m for T&D and £42.0m for OpsTech) within our work bank. These projects have been prioritised and, following a deliverability assessment, the most suitable projects will be shortlisted to utilise any funding made available if the outcomes highlighted in section 4.4 materialise. The projects that become part of our approved 'overprogramming' spend will be reviewed regularly to ensure they are deliverable and that the most impactful initiatives are funded.

4.8   If additional resources are required to deliver our projects, we will utilise existing channels to engage non-permanent labour (NPL). For Road User Charging and

vacancies related to expanding PAYG, we have the additional option of using the Crown Commercial Services framework.

4.9   An overall EFC has not been included as the Programme oversees hundreds of recurring projects, some of which have differing rates of refresh. Further detail of EFC changes by portfolio is provided in Appendix 3 and in the related paper on Part 2 of the agenda.

5   Delivering Value for Money (VfM) and Realising Benefits

5.1   This section provides examples of some of the initiatives we have undertaken to ensure we deliver VfM and tangible benefits to both our customers and colleagues.

5.2   We are procuring an Enterprise Architecture software platform to model our Programme's business capabilities and investment processes. It will be utilised across a range of activities such as business planning, reducing the current resource burden on our colleagues, and enabling them to focus more effort on delivery.

5.3   Working with TfL's Investment Appraisal team, we have established programme-level Benefits Management Frameworks to categorise and quantify project benefits where possible. Each project within the Programme will deliver against several core benefits which in turn contribute to TfL's Strategic Outcomes. In 2024/25 we will also exploit routine change control processes – such as Budget Change Requests and Drawdown Requests - to ensure business cases are still aligned to strategic outcomes and notable benefits will be realised.

5.4   We have conducted benchmarking analysis across various parts of the Programme to ensure that our spending is similar or more efficient than comparable organisations. For example, in early 2023 we were able to reduce the cost of Project Hina by £6.5m through the identification of efficiencies and successful contract negotiations with our supplier.

5.5   We periodically review our work bank to identify potential accelerations for critical works - opportunities to bring forward spend from future years into the current financial year - should underspend occur elsewhere or additional funding become available. This year, we were able to identify £6.1m worth of accelerations in 2024/25.

6   Strategic Case for Investment

6.1   Our Product Management teams work closely with service users across TfL to identify emerging business needs and determine the capabilities required to meet them. This informs our future investment opportunities and shapes our Technology Roadmap. Our Technology Roadmap outlines our contribution to the goals set out in the Mayor's Transport Strategy (MTS) and TfL's strategic priorities; the Technology Programme ensures safe and reliable journeys while making our transport network more attractive to customers.

6.2   Due to financial constraints, investment has primarily been focussed on renewals of key assets to ensure the continued availability of critical services. Of the Programme and Project Authority requested between 2024/25 and 2025/26, 71 per cent will be committed to asset renewal projects. Without this investment, TfL will experience several negative outcomes:

(a)   degradation in services that supply real time information for customers and station staff;

(b)   loss of productivity due to deterioration of operational processes responsible for safety, reporting, and enforcement;

(c)   potential data security vulnerabilities and breaches due to inconsistent application of security patches and upgrades; and

(d)   loss of revenue due to increased failure of payment infrastructure critical to making our revenue collection systems operable into the future.

6.3   These outcomes would also result in significant reputational damage for TfL, dissuading customers from using our service, and hindering the MTS objective of ensuring that 80 per cent of all trips in London are made on foot, by cycle or using public transport by 2041.

6.4   Our enhancements are also essential to preventing a loss of capability. For example, while many software and asset upgrades introduce new functionality and features, failure to carry them out will leave the organisation vulnerable to ever-adapting cyber threats. We need to invest in these enhancements to remain operationally compliant and secure. In recent years, however, TfL has been in a challenging financial position and we have deferred spend on enhancements to help the business meet its financial targets. As a result, spend on enhancements has significantly reduced from 66 per cent of our total work bank in 2018/19 (before the pandemic) to 22 per cent in 2024/25.

Supporting TfL's vision to become the strong green heartbeat for London

6.5   The Mayor of London has an ambition for London to be Net Zero by 2030. The Programme will support these goals by:

(a)   ensuring the continued reliability and availability of TfL operations by improving asset management processes, future-proofing applications used by field colleagues, and guaranteeing the availability of mission critical digital services;

(b)   increasing the attractiveness of public transport by improving our digital offerings such as the TfL website and the TfL Go app, making it easier for customers to plan and pay for journeys; and

(c)   reducing the environmental impact of TfL's technologies by executing our carbon reduction roadmap (see section 7). This work is currently being led by volunteers within our Sustainability Planning working group, however funding will be required to make significant progress.

7 Investment Plan 2024/25 and 2025/26

7.1 Several budget scenarios, for both renewals and enhancements, were considered during the Business Planning process. Technology renewals and enhancements are assessed against two separate frameworks overseen by TfL's Asset Strategy and Business Strategy Teams respectively, together with additional technology-specific criteria. The overall funding envelope for 2024/25 to 2025/26 is insufficient to deliver all projects within our work bank. To manage this gap, detailed prioritisation of projects has taken place to manage how spend is distributed within the Programme and is reviewed throughout the year.

Planned Expenditure by Investment Portfolio

7.2 The forecast in Table 3 below provides an overview of our past spend and our planned future expenditure in relation to our authority request in financial years to 2027/28 inclusive. This recognises that the existing budget constraints are forecast to continue for the next few years. 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. A proportion of future years spend is contractually committed, or is planned to be, before we next return to the Committee, details of which are in the related paper in Part 2 of the agenda.

	Existing Programme and Project Authority	Prior Years Spend	Planned Expenditure 2024/25	Planned Expenditure 2025/26	Future Commitments (26/27 and beyond)	Programme and Project Authority Requested	Total Programme and Project Authority
T&D	457.4	243.3	120.5	98.3	113.2	117.8	575.3
OpsTech	407.4	152.0	109.3	124.3	131.1	109.3	516.6
Total	**864.8**	**395.3**	**229.9**	**222.6**	**244.2**	**227.1**	**1091.9**

Table 3: Overview of financial request (all values are in £m)

7.3 Approval of the Programme and Project Authority sought for financial years 2024/25 and 2025/26 will enable our Programme to deliver high-value outcomes that will achieve benefits across TfL's strategic themes as set out in Table 4.

Theme	Business outcomes to be delivered by 2025/26
Our Customers	• Upgrading our automatic vehicle location systems and delivering improvements to real-time travel information to support customers at times of network disruption. • Introducing an integrated suite of new systems and tools to enhance road network management. • Delivering an enhanced cycling experience that aligns with the physical network (Cycleways) and encourages more confident experimentation with cycle routes. • Delivering 4G and 5G-ready coverage for customers of all four major mobile network operators on LU.

	• Developing a more personalised, data-driven TfL Go app experience that supports intelligent nudging towards sustainable transport modes.
	• Enhancing website travel tools that complement rather than replicate functionality in TfL Go, to provide customers with a more seamless journey planning experience. Updating train movement data on the Bakerloo line and lines within the Four Lines Modernisation programme to provide more accurate travel information to LU operational staff and customers.
	• Delivering a coordinated approach for managing non-docked micro-mobility to support safe, sustainable travel across London.
Our Colleagues	• Deploying wi-fi connectivity at LU stations and depots, supporting our colleagues' productivity and future-proofing our networks estate.
	• Introducing Operational Workforce Planning systems for more efficient utilisation of operational resources and self-service tooling as part of the wider transformation of our SAP Enterprise Resource Planning infrastructure up to 2027.
	• Preparation work for the roll out of Windows 11, including hardware refreshes, application testing, and capacity planning.
	• Digitising paper-based processes and enhancing existing systems to improve productivity and resilience.
	• Improving compliance processes for our on street operational enforcement colleagues, enabling streamlined enforcement of multiple contraventions across the road network.
	• Managing IT Services for the Greater London Authority, the Mayor's Office for Policing and Crime, the London Legacy Development Corporation and the Old Oak and Park Royal Development Corporation, allowing them to benefit from 24/7 support and greater technical and cyber security resilience.
	• Improving our network capacity and replacing communications devices to support our operational Bus and Coach Service Delivery colleagues who increasingly rely on connected devices (computers, tablets, and mobile phones) to perform their roles. We will also introduce an enhanced support model to improve colleague efficiency.
Our Finances	• Expanding contactless payments to 152 stations in the south east to enable a reduction in the use of paper tickets.
	• Investing in asset management capability for enhanced reliability and longevity of our assets across TfL.
	• Improving TfL's Irregular Travel Analysis Platform which identifies fare evasion from anomalous journey patterns and sales data.
	• Rolling out our Surface Asset Management System to support new surface technology contracts and complete the consolidation of LU asset management systems into Metro Maximo.
	• Awarding the new Revenue Collection Contract (Proteus).
Safety and Security	• Replacing critical radio hardware units, delivering improved network connectivity across LU.

	• Enhancing processes through technology for driving efficiency and ensuring safety on our stations. • Renewing and extending our operational network capacity and capability across LU to ensure we can continue to run a secure and supported operational network. • Continued roll out and refresh of BWV Cameras and ECDs to colleagues in customer facing roles to reduce the risk of workplace violence and aggression and improve reporting of incidents. • Continuous investment in our cyber security for our most critical corporate and operational technology to ensure robust security from external threats. • Installing over 300 Deployable Enforcement Cameras across the road network to reduce road danger, increase bus lane compliance, and reduce congestion at junctions. • Enhancing our incident response system, supporting our colleagues' ability to respond to critical incidents on LU and improving the safety of our customers.
Our Green Future	• Delivering various projects (such as Laptop Refresh and Telephony Refresh) which will provide tailored IT based on each colleague's role. This will reduce the number of devices being used in the organisation and replace end-of-life devices with more efficient ones. • Bringing 450 additional e-bikes into service by July 2025 and 1,400 e-bikes into service by September 2025, providing greener travel choices for a wider customer base. • Executing our carbon reduction roadmap which involves benchmarking our current carbon footprint, acquiring resources that will allow us to effectively monitor and reduce our carbon footprint, providing Carbon Literacy training to our colleagues, introducing sustainability principles to our supplier engagement, and identifying any necessary changes to our Operating Model.

Table 4: Business Outcomes to be delivered by the Technology Programme

7.4   A detailed list of projects in scope for 2024/25 and 2025/26 is provided in Appendix 2.

8   Risks and Opportunities

Key Risks

8.1   Table 5 below outlines the key risks the Programme will face, and the steps we have taken to mitigate those risks.

Risk No	Risk Description	Mitigation Actions
1	The merger of T&D with OpsTech into the Technology Programme is highly complex due to the size of the two areas, the variety of what we deliver, and diverse range of customers we support. There is a risk that the benefits of the change will not be achieved if not supported by a formal change programme.	A detailed review of the operating model is required to ensure we maximise the opportunities for efficiencies and meet the demands of the organisation. Initial work on the operating model has begun with a working group convened to document 'as is' processes to support any future changes. The working group has so far identified four areas of focus: Sponsorship, Project Controls, Technology Strategy, and Investment Strategy. A change programme is being taken forward in 2024/25 covering end to end technology across the elements outlined in the recommendation to ensure a smooth and effective transition.
2	It remains challenging to fill specialist or senior roles resulting in our management layer being overstretched. As a result, our ability to deliver challenging projects in our complex environment is strained. There is a risk that there are insufficient resources available to deliver the 2024/25 investment programme.	TfL is reviewing our Employee Value Proposition and Reward Strategy by ensuring the benefits TfL provide are attractive to our colleagues and potential hires. Within the Programme, we have formulated a resource strategy outlining how we are beginning to address this risk. For example, we have already increased our permanent full time employee numbers (100 per cent improvement in period 9 of 2023/24) reducing our dependency on NPL.

We regularly review the criticality of our projects to forecast demand and ensure effective prioritisation of our resource. We are also adopting TfL's Smart resourcing tool, SmartCore, to improve our ability to visualise and track our resources. We will work more closely with our stakeholders to better maintain our service catalogue. This will provide better visibility of pipeline activities and allow us to forecast demand more accurately. |
| 3 | We are facing uncertainty around future funding levels whilst prices continue to increase. As a result, we have reduced costs by sweating assets beyond expected end-of-life. This has increased the risk of catastrophic asset failure, | We undertake regular and detailed scenario planning, modelling investment against a range of potential funding outcomes. These activities can be time consuming, reducing capacity for delivering work.

While we have an effective and proven process for dealing with major incidents, we are undertaking work to define our technical debt and mitigations. |

	forcing reactive work that impacts delivery of our investment programme.	We also regularly review and maintain business continuity plans for TfL and critical suppliers.
4	Forecast optimism continues to be a challenge across the Programme. There is a risk that inflated forecasts, which overestimate the in-year financial spend, will lead to inaccurate budget setting and underspend.	Detailed deliverability reviews have been undertaken to assess 2024/25 forecasts in line with the business planning process to mitigate optimism bias. A review of risk provision was also included to ensure allocation of risk is appropriate to the scale and stage of the projects. Overprogramming remains a core part of the financial plan to mitigate underspend in-year.
5	A cyber security incident may result in operational, financial, reputational, legal, regulatory, environmental, public safety and, potentially, national economic consequences. This may also inhibit our ability to deliver projects across the Programme.	Our recently published 2023 Cyber Security Strategy outlines our ambition to maintain investment in our people, processes, and systems such that the probability and impact of a successful attack are reduced to acceptable levels. This involves providing adequate training to all relevant TfL staff and adopting industry best practice.

Table 5: Key risks and mitigations of the Technology Programme

Key Opportunities

8.2   Table 6 below sets out a range of opportunities that we can exploit to deliver additional value to our customers and colleagues:

No	Opportunity Description	How can we take advantage of this
1	The Mayor's target for London to be Net Zero Carbon by 2030 provides an opportunity to deliver sustainable technology and have a positive impact on the environment.	This will require investment in sustainable IT initiatives and market research – which is currently not planned. TfL will also need to adopt procurement practices that take our suppliers' carbon footprints into account.
2	We can ensure better prioritisation of projects, spend, and resources across the investment plan.	Implement the Programme in full with aligned, effective governance and prioritisation.
3	We can better exploit our data (and other technology solutions) to deliver efficiencies and drive out costs.	Adoption via Our TfL Programme of the Data Strategy and an organisation-wide push to release the benefits of TfL's data.

Table 6: Key opportunities of the Programme

9   Equalities Implications

9.1   Section 149 of the Equality Act 2010 (the Public Sector Equality Duty) provides that, in the exercise of their functions, public authorities such as the Mayor and TfL must have due regard to the need to:

(a)   eliminate discrimination, harassment, victimisation, and any other conduct that is prohibited by or under the Equality Act 2010;

(b)   advance quality of opportunity between persons who share a relevant protected characteristic [1]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   Compliance with the Public Sector Equality Duty is ensured within the Programme at a project level, with all schemes undertaking Equality Impact Assessments to identify potential impacts. We also routinely engage with the Independent Disability Advisory Group (IDAG) at early stages of our projects to help inform design requirements. For example, following engagement with IDAG, we tightened our requirements on the visibility of Countdown (next-bus arrivals) signs so that they are accessible to more customers like the elderly / those with visual impairments. We have also set up an Equality Working Group with bus drivers and service controllers to engage on design of our iBus2 solution. This has influenced screen positioning, text size, and colours for improved colleague accessibility.

10   Assurance

10.1   An Assurance Review on the Programme was carried out in November 2023 by the TfL Assurance Team and IIPAG. Two critical issues were raised by IIPAG and Project Assurance on the need for a structured / formal change programme. Four further recommendations were raised, responses to which have been provided.

10.2   First line assurance will be carried out on the Programme and its constituent projects. The next Programme level assurance review will be undertaken in advance of, and reported in, the next annual submission to the Committee in March 2025.

List of appendices to this report:

Appendix 1: Summary of the Programme Costs and Funding
Appendix 2: Delivery since last Committee submission and plan to next submission by portfolio

---

[1] Protected characteristics under the Equality Act are age, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex, sexual orientation, and marriage or civil partnership status (the duty in respect of this last characteristic is to eliminate unlawful discrimination and other prohibited conduct under the Act only)

Appendix 3: 2023/24 Changes to EFC and rationales for significant differences in Programme EFC by portfolio
Appendix 4: Breakdown of 2023/24 forecast spend (Period 9) against forecast at previous submission

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

List of Background Papers:
Programme and Investment Committee papers:
Technology Programme: July 2023
Technology and Data: March 2022, March 2023
Surface Technology: March 2019; October 2020; March 2021; October 2021; July 2022
London Underground Technology: October 2020; May 2022
Programmes and Investment Committee Programme Structure: May 2023

Independent Investment Programme Advisory Group Report and Management Response

TfL Project Assurance and Management Response.
Contact Officer: Rebecca Bissell, Director, Information Technology
Email: RebeccaBissell@tfl.gov.uk

Contact Officer: Shashi Verma, Chief Technology Officer
Email: ShashiVerma@tfl.gov.uk

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

Appendix 1 – Summary of the Programme Costs and Funding

Portfolio			Business Plan Year							Total
Rounded to £m			22/23	23/24	24/25	25/26	26/27	27/28	Commits 28/29+	
Cost	Base Gross Draft Forecast values	**(A)**	186.8	213.0	304.5	317.4	285.9	225.0		1,532.6
	Management adjustment to account for schedule optimism		0.0	(4.5)	(74.6)	(94.8)	(32.9)	(19.2)		(226.1)
	Investment Programme Total Gross	**(B)**	186.8	208.5	229.9	222.6	253.0	205.8		1,306.5
Funding	Financial Authority	**(C)**	186.4	212.8	223.7	218.7	226.5			1,068.0
Authority	Existing Project Authority	**(D)**	179.4	266.1	234.2	102.9	72.6	9.7		864.8
	Transfers	**(E)**	-	-	-	-	-	-		-
	Project Authority less Transfers	**(F) (D+E)**	**179.4**	**266.1**	**234.2**	**102.9**	**72.6**	**9.7**		**864.8**
	This Project Authority request	**(G) (B-F)**	**7.4**	**(57.6)**	**(4.4)**	**119.7**	**79.8**	**65.0**	**17.1**	**227.1**
	Future Project Authority request	**(H)**					**100.6**	**131.1**		**231.7**
Income	Investment Programme Income*	**(I)**	6.8	3.1	2.1					12.2
Income	Financial Authority Income	**(J)**	**6.8**	**2.6**	**1.9**					11.3

(A) Work bank before overprogramming
(B) Costs net of the management adjustment for overprogramming
(C) Financial Authority is based on the Business Plan up until Financial Year 2026/27
(D) Programme and Project Authority based on existing approvals
(E) Transfers into or out of the Programme
(G) This project authority request for FY26/27 onwards is for commitments only
(J) Financial Authority Income is based on the Business Plan up until FY26/27

* The bulk of the income reduction is due to the Barcode Readers project which is netted off by slightly higher income on Greater London Authority and London Legacy Development Corporation work and other smaller project income.

Appendix 2 – Delivery since last Committee submission and plan to next submission by project group

T&D

Portfolio	Expected and Actual Outputs in 2023/24	Expected Outputs in 2024/25
Contact Centre Operations (CCO) **Notable Projects**: Concessions Re-tender (both inflight and future), Lost Property System	**Control our costs by continuing our outsourcing strategy** **Achieved:** Renewed and enhanced Contact Centre Operations Framework in place. Expanded the scope of what we can contract under it, e.g. we can now outsource development and management of CCO-related technology through the framework.	The moving to two new suppliers for Contactless Payment Card contact handling, May 2024, to minimise dependency on the performance of a single supplier. The retender of the Interactive Voice Response system and self-serve telephony is due to be completed July 2024. The concessions management system and associated contact handling retendered and contract awarded Quarter 3 2024.
Cyber Security **Notable Projects**: Operation Technology (OT) Detection Tooling Expansion, Vulnerability Remediation, Advanced Endpoint Protection	**Achieved:** Successful OT to Information Technology (IT) proof of concept; End Point Protection enabled; Cyber Security Ezone - new pan-TfL cyber training launched. **Achieved**: Azure Information Protection Protective Marking, Phase 2, is complete with mandatory classification marking deployed across core office tools.	Deliver or enhance elements of our pan-TfL cyber security improvement roadmap: Coordinate and support the management of cyber security risk pan-TfL, both for IT and OT.

	Achieved: OneLondon Security Essentials has delivered new endpoint protection capability to OneLondon laptops, significantly reducing the risk of compromise via a thick client.	**London Underground (LU) Cyber Security Improvements for Operational Systems:** Improve LU compliance with cyber security regulation – specifically the Network and Information Systems Regulations 2018 , to be completed in financial year 2024/25
Data & Analytics **Notable Projects**: Enterprise Data Development, Self-Service Reporting Refresh	**CLEO Framework** (The CLEO Framework is the Data and Analytics strategic solution for TfL's Enterprise Data Warehouse.) Build and solution deployment into production environment completed May 2023 as planned. **SHE Data Storage** Go-live re-planned for August 2023, achieved November 2023 due to emerging technical complexity. Project is now in early life support with project completion in January 2024.	**CLEO Framework additional enhancements:** This year we will complete phase 2 of the core CLEO migration to Azure with the as is platform hosted in Azure and then will move on to deliver phase 3 which is about modernising and implementing new framework approaches. The migration of Oyster Clicks Model will be completed by the end of this year and will move colleague in payments to a supported platform. **Performance Data Warehouse** Requirements gathering and high-level design are in progress with target completion of April 2024. This will enable, over the course of the next financial year, the completion of about a third of data pipelines that are in scope of the project and to lay foundations for a secure and GDPR compliant platform for LU service performance reporting.

Digital **Notable Projects**: TfL Go Continuous Improvement, Data and Application Programming Interface Continuous Improvement	**Deliver a range of upgrades to our TfL Go app, including the** **integration of live bus updates and routes,** **Oyster and contactless payments and National Rail departures** **Achieved:** From 2024 customers will be able to top-up their Oyster card, buy Travelcards, and view Oyster/contactless journey history in one app. We have also integrated Superloop into Journey Planner and delivered new strike functionality to support customers at times of disruption (a key customer pain point). Customers can now see greyed-out line sections (closures) and glowing line sections (disruptions) on the live Tube map. We've also added detailed bus route information to TfL Go, plus released live step-free access information on Electronic Service Update Boards in stations - greatly improving access to critical information for mobility impaired customers.	**Continuous Improvement of TfL Go:** Further improvements to real-time travel information, including live bus locations, to support customers at times of network disruption. Delivery of an enhanced cycling experience that aligns with the physical network (Cycleways) and encourages more confident experimentation with cycle routes. A more personalised, data-driven app experience that supports intelligent nudging towards sustainable transport modes. **Improve the TfL website:** Enhanced website travel tools to support people using our network that complement rather than replicate functionality in TfL Go. Management System and the migration of relevant website content to reduce support costs. Both to be delivered by Quarter 4 2024.
Digital Workplace **Notable Projects**: Laptop Refresh, Thin Client Refresh, Telephony Strategy	**Updating Our Desktop Experience, providing a simplified,** **consistent, people-focused experience** **Achieved:** Enhanced the desktop experience for smart meeting rooms across the estate; Delivered the 5ES Auditorium; Updated Display Names for all TfL employees; Procured/deployed laptop devices	Improve the digital maturity and productivity of our workforce. Embed a new desktop experience for our colleagues including new thin clients. Improved data management, protection, and governance.

	for prioritised Citrix and RA users; Completed requirements gathering across entire Desktop service; Removed Windows XP, and circa75 per cent of remaining Windows 7 instances; Launched Windows 11.	Maximise value and reduce costs and environmental impact. All to be delivered by Quarter 1 2025.
Enterprise Resource Programme (ERP) **Notable Projects**: Surface Workforce Management, SAP S4 Hana Upgrade	**Continue to make updates to the SAP estate across TfL** **Achieved:** Gate 2 for Core Enterprise Resource Planning S/4HANA Project on track with significant work to baseline requirements and market tender complete by Dec 2023. **Transform our people processes and technology to deliver a great experience for all our colleagues by replacing our Core Human Resources system with MyJourney (SuccessFactors Phase 2)** **Achieved:** Operations Workforce Management Project: commercials, contract award, and sign-off with UKG as systems integrator to deliver Phase 1.	**Success Factors Phase 2:** Employee Central and Recruitment & onboarding modules inflight to be completed by October 2024. **Operations Workforce Management Phase 1 Tranche 1:** Completion forecasted for October 2024 – this will deliver workforce management, time, and attendance for Compliance, Policing, Operations and Security (CPOS) and Bus and Coach Service Delivery business areas. **SAP S/4HANA:** In financial year 2024/25 the project is aiming to analyse and, as much as possible, improve the business processes and remediate data quality issues on SAP before the system integrator is onboarded. The project is also aiming to implement SAP Business Technology Platform for HR relevant processes to improve the user experience, a Business Process Management tool, and a Training Tool. The project will also begin implementing a Master Data

		Management solution to maintain the quality of data on SAP systems.
Hosting **Notable Projects**: Tech Infrastructure Refresh, New Datacentre, Payment Infrastructure Tech Refresh	**Ransomware Protection Project (CyberVault)** Successfully achieved the Tier 2 milestone of the platform being ready for service and the creation of a "clean room" environment to facilitate restore of data in the event of a ransomware attack. **Operating Systems and Data Bases project** Refreshed 88 services along with decommissioning 852 servers and 2,416 databases that were no longer in use, saving at least £1m in annual OpEx costs. **Payments Asset Refresh Project** Core back-office network delivered and deployed in Data Centre. **Storage Tech Refresh Project** Storage arrays for home drive data brought into production, completion of "Recover Point" delivery, new Data Centre Infrastructure management capability.	Deliver a cyber vault platform to secure critical data from Ransomware attacks. Transform and modernise T&D's monitoring capability to provide reliable, proactive, and consistent monitoring of on-premise and cloud based T&D managed services. Complete the Citrix Application Delivery Controller Refresh by June 2024. Modernise our core technical end user computing platforms such as remote access, identity, and virtual desktops infrastructure to support our digital workforce.
Networks **Notable Projects**: Access Network Contract Extension, wi-fi Station Rollout, Tech Refresh (Surface Scope)	**Refresh wi-fi Connectivity at LU Stations and Depots, future-proofing against potential 5G data constraints** **Partially Achieved:** Vast majority of the key infrastructure components (the Wireless Access Points (WAPs)) are now end-of-life and have become increasingly problematic to support, resulting in performance issues; 2,500 WAPs have been procured with a further 2,000 soon to be procured. Networks will complete 28 Train Crew Accommodation sites before the end of March 2024.	Completion of the new wireless local area network controllers. The detailed planning and sign off of our wi-fi coverage and performance principals that will feed into our overall design that will determine what our estate will look like. The engagement with the wider business to understand new and emerging connectivity requirements. The delivery and evaluation of our proof-of-concept sites (likely to be between three and five).

	Replaced wi-fi in three floors of Albany house to test the new Cisco 9166 Access Point (AP) units and will install up to 50 more APs before April. We will also be installing wi-fi in Mandela Road Dial a Ride (DaR) site as well as surveying and providing costs to install the remainder of sites by the end of this financial year.	It is not anticipated that we will begin full rollout of the programme until March 2025.
Payments Notable Projects: Hina, Oval, Barcode Acceptance, Proteus, Next Generation Reader	**Achieve a significant reduction in operational revenue collection costs by delivering a smooth transition to the future Revenue Collection Contract** **Partially Achieved:** The programme is making good progress and meeting milestones despite some setbacks causing delay to a strategic milestone - the overall project completion date is held. Contract award for Revenue Collection estimated for August 2024. **The Hina Project will re-develop our Card Reader hardware and software and replace the existing assets across our transport network** **Achieved:** Hina reader contracted with Cubic, achieving a negotiated saving.	Development of the Hina complete to point of enabling the first stage of payment card acceptance (known as Europay, MasterCard, and Visa (EMV) accreditation). Milestone expected in Quarter 3 2024. Deliver a replacement Pin Entry Device (PED) into vanguard in January 2025, mitigating the risk of depleted PED spares.
T&D LU Notable Projects: Protecting Workers on the Track Safe Tack Access – Mobile App, Triapps, Computerised Track Access Control	**Station Management System** **Achieved:** Go live in stations, incorporating Logbook, Asset Checks, Station Security Checks and admin portal. Enhancements to Real Time Information app, which is used to report lift, escalator, andtoilet issues to customers.	Updating Trackernet to present new information and data on the Bakerloo and lines within the Four Lines Modernisation programme: Both projects are replacing end-of-life hardware, reducing risks, and improving system resiliency.

	Improvements to Turn Up and Go app, meaning information relating to customers with accessibility needs is more available to staff. New Safe Track Access and Station Access apps built, to support different aspects of safe working of track and contractor staff at stations.	**Network Operations Centre Admin Project:** Current completion planned in mid-2024, with improvements being made to system that publishes disruption-related information to customers.
T&D Surface Notable Projects: Digital Radio Replacement, Geographical Information System Redevelopment, Bus Systems	**Project Adiona** (Replacement of the core back office systems of Busnet, Caesar and Stop Specific Time Table which are over 13 years old, and the contracts are end-of-life.) **Partially Achieved:** Detailed design achieved for Adiona upgrade and development complete. **Predictive Bus Diversion** **Partially Achieved:** The model is complete and this initiative has now moved to Bus Customer Action Plan Investment portfolio.	Adiona 1.0 will be delivered mid-July 2024. GIS renewals to be complete by Quarter 4 2024. Wave on Cloud Web dispatcher plug-in to be complete in Quarter 3 2024.
Technology Services Operations (TSO) Notable Projects: Core Support Services, IT Service Management (ITSM) Tooling Solution, GLA IT Transition	**Access & Wide Area Network Performance Review**: **Partially Achieved:** Planned complete May 2023, delayed due to technical complexities and third-party resource constraints. All remediation works and early life support completed November 2023. **Joiners, Movers, Leavers Project:** **Achieved**: Development and testing completed November 2023 and project forecasts completion in January 2024. **GLA IT Shared Service Technical Transition:** **Partially Achieved**: Due to scope changes required by GLA and Mayor's Office for Policing and Crime, timelines across the project were extended namely;	Deliver ITSM Tooling Solution Procurement Deliver TSO Process efficiencies Deliver critical network initiatives including Firewall Management platform as well as contract retenders in future years.

	- Network drive migration was scheduled to complete April 2023 but completed October 2023 - O365 Migration contract award planned for February 2023 completes Nov 2023 - Printer rollout planned for May 2023 now completes January 2024.	
Telecomms Commercialisation Programme (TCP) Notable Projects: TCP – Emergency Services, Elizabeth Line Acceleration	**Deliver full LU 4G and 5G-ready coverage for customers of all four major mobile network operators, delivering significant ongoing revenues for TfL.** **Partially Achieved:** We have moved to a joint 4G/5G programme, accelerated the Elizabeth line and added the Dockland Light Railway and London Overground to the scope. A plan is being put in place working with Rail for London Infrastructure to introduce connectivity on the Elizabeth line stations (8) and tunnels (22 sections). **Deliver new Emergency Services Network (ESN) giving first responders immediate access to life-saving data, images, and information in emergencies in the frontline** **Partially Achieved:** ESN is in the project delivery stage.	Deliver ESN services: Transition in London from Airwave to ESN from 2024 is dependent on the availability of ESN services on the Underground by this date. Enable Commercial Mobile Services (CMS)for revenue generating potential: Potential to monetise CMS and provide TfL an additional revenue stream.

OpsTech

Portfolio	Expected and Actual Outputs in 2023/24	Expected Outputs in 2024/25
Connectivity **Notable Projects:** Bus and Coach Service Delivery Technology	**BCSD TIP:** Network connectivity upgrade at five trial bus station sites; initiation of delivery at a further 31 sites.	**BCSD TIP Network Renewal:** Continued delivery of high-speed broadband connectivity to the 36 bus and coach stations by Autumn 2025.

Improvement Programme (BCSD TIP) Network Renewal; Connect; Connectivity Asset Renewal Programme (CARP);	**Delayed:** Improved network connectivity / wi-fi across the five trial bus stations is underway which will provide improved connectivity for colleagues in their role supporting customers; initiation of further 31 sites has commenced with initial surveys complete. **Connect:** Completion of next stage of Connect Programme, radio unit delivery and hardware / software upgrades. **Achieved:** Roll out of radio hardware base units at 295 sites by July 2023, ahead of schedule, delivering progress towards improved radio network connectivity for colleagues working across the LU. **CARP:** Progression of the CARP Programme including: Gate A, equipment order, design and delivery plans. This includes **Achieved:** CARP: Programme assurance review and commencement via Gate A completed in November 2023.	**Connect:** Roll out of new radio handsets to the 295 base stations **CARP:** Migration of the incremental Circuit Migration across lines and connectivity of the Renewed Operational Network will be extended to stations and control centres as well as development of procurement strategy and initial market engagement.
Enforcement, Compliance, Safety and Security **Notable Projects:** CPOS Enforcement, Compliance and Operational Safety (ECOS) ; CPOS Data Futures; Operation Staff Safety (OSS) Programme; Deployable Enforcement Cameras (DEC); Ending Violence Against Women and Girls (EVAWG), BCSD TIP Station Security; Station Security Technology Integration Programme (SSTIP);	**ECOS:** CPOS operational officers to have mobile access to four areas: Taxi and Private Hire (TPH) appeals, rail revenue inspection, transport safety enforcement and prosecutions and penalty fares process. **Partially Achieved:** Mobile access to two areas (Bus Revenue Inspection and Transport Support and Enforcement officers) by March 2024, Delay to delivery of TPH Lara into 2024/25 due to delays to TPH re-let project meaning that inspections have not been included.	**ECOS:** Complete development and in-sprint testing by October 2024.

| Traffic Order Management Enforcement solution (TOME). | **CPOS Data Futures:** Development of the CPOS Data Hub, adding data feeds throughout 2023/24 and 2024/25. Commence development (2023/24) and implement (2024/25) a replacement reporting solution for internal stakeholders by December 2024.
Achieved: Delivered key data feeds and commenced development of the reporting solution ahead of implementation.

OSS
-**Bodyworn Video cameras:** Options analysis for non-oyster camera check out method and delivery of a system that can automatically process and label video footage (Auto-tagging) which is currently done manually and is very time consuming.
Achieved: Options analysis and auto-tagging completed.
-**Pan TfL Work-related Violence and Aggression (WVA) Case Management and Reporting:** Requirements scoping, options analysis and option selection to be completed.
Achieved: Scoping undertaken for both projects; decision to proceed with 'buy' option for Case Management.
-**Emergency Communication Devices (ECD):** Delivery of remaining 300 ECD in phase 1 and development of a future proofed solution in phase 2.
Partially Achieved: Delivery of 254 devices and remainder in progress meaning that colleagues have a simpler, discreet and more direct emergency support. Phase 2 delayed due to resource limitations. | **CPOS Data Futures:** Delivery of the reporting solution.

OSS:
-**Pan TfL WVA Case Management and Reporting:** Contract award and implementation of the new Case Management system.

-**ECD:** early market engagement, procurement and contract award for phase 2.

DEC:
-**Continuation of delivery of cameras within Phase 2**
-**Attended Parking Enforcement Cameras:** Completion of 10 site trial |

	DEC: Project close of phase 1; installation of 265 sites in 2023/24. **Partially achieved/delayed:** Phase 1 project closed; Phase 2 delivery slower than expected due to revised methodology for delivery and inability to enforce cameras in bus lanes. **BCSD TIP Station Security:** Phase 1 option selection and detailed design for a new station security check process and incident reporting system. The delivery of which will be undertaken in 2024/25; as well as starting delivery for an E-Log Book and initiating Phase 2 - which will focus on Customer safety and security. **Partially achieved / Delayed:** Delayed due to project requirements needing to be redefined following project pause in 2021. Following restart, requirement capturing has commenced. **SSTIP:** Critical connectivity upgrades to TfL's CCTV estate to improve GDPR compliance and our ability to respond to major incidents. Continued installation of Critical incident management CIM. **Achieved:** Design of all 27 CIM completed with 5 installed; 10 of 21 stations with remote CCTV live. **EVAWG:** -**Passenger Help Point** 15 sites installed and went live, re-routing emergency calls to the LU control centre.	and feasibility report which looks specifically at parking enforcement. **BCSD TIP Station Security:** Option Selection, detailed design and commencement of delivery. Defining and initiation of phase 2. **SSTIP:** Delivery of CIM network on Circle, District and Hammersmith and City lines including go-live and completion of CCTV elements including handover to maintenance. **EVAWG:** **PHP:** Re-routing emergency calls at a further 150 stations. **TOME:** Completion of contract and implementation of first phase of solution.

	TOME: Completion of scope and options selection, the requirements build and procurement activities by December 2023. **Partially achieved/Delayed:** Completion of scope and option selection. Procurement activity more complex than originally planned and delayed to 2024/25.	
Cycling and Micro-Mobility **Notable Projects:** London Cable Car (LCC) Passenger Communication System (PCS); Cycle Hire Modernise & Electrify; Micromobility Rental Programme	**LCC PCS:** Complete delivery and handover to operations. **Achieved:** LCC PCS upgraded and handed over to operations, delivering improved network connectivity for safe operations and a good customer experience. **Cycle Hire Modernise:** Complete delivery of the back-office upgrade. **Partially Achieved / Delayed:** Cycle Hire Modernise; Further software releases complete to improve system performance and customer experience. Completion of the project delayed until 2024/25 due to supplier delays. **Ongoing development of the Micro-Mobility Rental Programme and its projects** (Cycle Hire Re-let, Non-Docked Procurement, E-Scooter Phase 2). **Achieved:** Micro-Mobility Rental Programme; 23/24 outputs delivered, including launch of Cycle Hire Re-let competitive tender and contract award for E-Scooter Phase 2.	**Cycle Hire Modernise** Complete delivery of remaining back-office upgrade, including GDPR compliance **Cycle Hire additional e-bikes:** Additional 450 e-bikes into service by July 2025 and total of 1,400 e-bikes into service by September 2025 **Micro-Mobility Rental Programme** Complete definition of the programme and define remaining work tranches. Specific project outputs include: - Cycle Hire Re-let; Contract award by November 2024 and commence supplier transition; - Non-Docked Procurement.
Digital Asset Management	**AMIS: Complete delivery of AMIS migration.**	**AMIS** Complete delivery of AMIS migration and close the project.

Notable Projects: Asset Management Information System (AMIS), Digitising Asset Management (DAM) Programme, Remote Monitoring to Next Generation Remote Monitoring (RM to NGRM)	**Delayed:** AMIS migration delayed to May 2024 due to performance issue of critical mobile sync functionality. **DAM Programme:** Issue a tender pack for a new Decision Support system in September 2023, and procurement of specialist consultant resources to support design and delivery of the long-term digital strategy. **Partially Achieved:** DAM split into programme development activities and priority tactical projects progressed in parallel. **DAM Programme development**; Issue of tender for specialist consultancy delayed to May 2024 due to resource availability; Landscape review undertaken to inform tender. **DAM Tactical Projects**; Tender pack for Decision Support Tool to support investment decision making delayed until April 2024 due to resource constraints. **RM to NGRM:** Software development and procurement activities to award contracts for equipment purchase and to deliver connectivity to 881 traffic signal sites. **Partially Achieved:** RM to NGRM; Software development nearly complete. Hardware purchasing delayed due to protracted negotiations for the connectivity solution with Capita.	**DAM Programme** **DAM Programme Development**; Procure specialist consultancy to support programme development activities. **DAM Tactical Projects**; Complete capture of necessary fire precaution data for buildings; Award contract and begin implementation for a Decision Support Tool to improve investment decision making. **RM to NGRM** Award contract for hardware purchase and connectivity rollout.
Network and Public Transport Management **Notable Projects:** BCSD TIP Financial and Commercial, Bus Business Intelligence Reporting	**BCSD TIP Financial & Commercial:** Project initiation of system to enable financial efficiencies / commercial opportunities to detail design stage. **Achieved:** BCSD Initiation planned for early 2024.	**BCSD Financial & Commercial** Optioneering and detailed design to be undertaken. **BBIR**

(BBIR), Countdown 3, iBus2, Future Bus Systems 2 and 3, Passenger Incident Management Systems (PIMS), Surface Intelligent Transport System (SITS), Tunnels Controls System, TfL's Video Management System (TVMS)	**BBIR:** Contract variation in July 2023 to provide an interim solution and enhancement of the existing reporting tool for extracting bus data until iBus2 is completed in 2027. **Delayed:** Contract variation for BBIR delayed from July 2023 to March 2024 due to further options analysis being undertaken. Increase in OpEx support costs during 2025/26 as a result. **Countdown 3:** Contract award for procurement of new contract for supply, installation and maintenance of Countdown signs and communications upgrade to existing signs by December 2023. **Delayed:** Commercial tendering process for Countdown 3 has been delayed by a few months to provide additional time for bidders to submit robust submissions that offer value for money for TfL. Contract award now planned for August 2024. **iBus2:** Contract award for upgrade to current iBus system including assets and continuation of service by March 2024. **Achieved:** iBus2 contract award expected to be secured in February 2024. **Future Bus Systems 2:** Contract award for the renewal of existing bus contracts management system by March 2024. **Delayed:** Contract award for replacement of Bus Contract Management System delayed from March 2024 due to lack of resources and review of potential for in house development.	Contract variation in April 2024 to provide the interim solution. Proof of concept to be developed to work in parallel to provide transition from iBus to iBus2. **Countdown 3** Contract award recommendation to upgrade London's on street Countdown signs by June 2024 followed by mobilisation, detailed design, service readiness and operational commencement by the end of 2024. **iBus 2** Supplier to be mobilised and detailed design and testing to be completed by November 2024 ahead of operational commencement in February 2026. **Future Bus Systems 2** Contract award by October 2024. After which, detailed design carried out with project go-live in April 2026.

| | | **PIMS:** Completion of option selection stage for this project which aims to renew capability for our control centres to manage passenger incidents effectively, including sharing information with third parties.
 Partially Achieved: Requirements gathering ongoing – external spend on project has been paused to focus on finalising this activity.

 SITS:
 -Real Time Optimiser (RTO): Core development of the RTO system to be complete by December 2023 with go-live and migration to the new system by March 2024.
 Achieved: On track for go live in March 2024.

 -Common Operational View (COV) Incident Management System (IMS): Completing the build of COV IMS and final features (RTO, Video Management System (VMS) and Decision Support Service (DSS). Old system to be decommissioned in June 2023 following go-live in April 2023.
 -Achieved: System went live in June 2023. VMS and DSS were not required for go live and are not completed.

 -Data Service Hub (DSH): Automatic number Plate Recognition (ANPR) and iBus data will be transferred from the existing platform to the Data Service Hub and re-tendering for a Data as a Service feed to support real time demand
 Partially Achieved: ANPR, iBus and Inrix data transfer delayed due to resource pressures and design complications. | **PIMS**
 Continue requirements gathering and undertake market engagement ahead of tender process in 2025/26.

 SITS:
 -RTO: Migration to full live environment by May 2024. Commence RTO roadmap projects.

 -COV IMS: Complete system development including additional ULEZ scope.

 -DSH: Complete data ingestion for ANPR, RTO, Inrix enriched and iBus.
 -Video Analytics: Procurement for video analytics solution and commence solution development.
 -Data as a Service Re-Let: Procurement of a new service for the real time journey time data that feeds into COV IMS.
 -Data Roadmap: Start Proof of Concept. |

	-Predictive: Re-starting project, completing option selection and commencing tender process ahead of delivery in 2024/25. **Partially achieved:** Option selection nearing completion, procurement delayed to 2024/25. **Tunnels Controls System:** Development of requirements, options, business case and procurement strategy **Achieved:** Options analysis undertaken and initial option selection confirmed. Procurement strategy in development. **TVMS:** Procurement of contract for software system to view and operate CCTV cameras owned by TfL and our partner organisations. **Partially achieved/delayed:** Publication of tender in November 2023; tender release delayed due to internal resource constraints.	**-Predictive:** Complete option selection and market sounding exercise. **Tunnels Controls System:** Continue preparation for tender of new system **TVMS:** Preferred supplier Invitation to Submit Final Tender for acceptance by November 2024
Tools for Planning, Automation & Staff **Notable Projects**: Access Planning System (RailSys), Assisted Transport Services (ATS) DaR Booking and Scheduling, BCSD TIP, Planning Process Optimisation, SAFE 2, Sentinel.	**Access Planning System (RailSys):** Delivery of the new access planning system which will improve our ability to plan and co-ordinate works on the LU network - and improve reporting. Delivery and project close will conclude in March 2025. **Achieved:** Design and development of additional functionality and automating of manual reports underway, requirements for publications complete. **ATS DaR Booking and Scheduling:** Design and delivery of the new booking and scheduling system ahead of project close in 2024/25. **Achieved:** Project is on track to complete in 2024/25 which will deliver benefits for customers	**Access Planning System (RailSys):** User acceptable testing planned for April 2024, with project go-live due for September 2024 followed by project close. **ATS DaR Booking and Scheduling:** Delivery due to complete in April 2024 with project close in May 2024.

	Dial a Ride and colleagues once the system has gone live. **BCSD TIP Device Refresh:** Delivery of a strategic support model for staff devices and purchase of additional devices. **Achieved:** New devices purchased for operational staff.	
	Planning Process Optimisation: Project initiation **Achieved:** Project initiated and feasibility study undertaken.	**Planning Process Optimisation:** Scope definition, agreement of delivery approach and undertaking procurement activities.
	SAFE 2: Contract award, option selection and delivery of updated software to improve cyber security of Surface Transport Incident Management System **Partially achieved:** Contract award expected before the end of 2023/24 but delivery has been delayed to summer 2024/25.	**SAFE 2:** Delivery of updated software in summer 2024 and benefits realisation.
	Sentinel: Project initiation and commencement of procurement activity to align with Network Rail replacement of Sentinel system, prior to supporting delivery in 2024/25. **Delayed:** Project initiation delayed due to ongoing Network Rail study into current system and feedback from report expected late Feb	**Sentinel:** Scope definition, agreement of delivery approach and procurement preparation.
Pipeline **Notable Projects:** Various	**Initiate the development of technology renewals and enhancements projects.** **Eight projects initiated**, including BVW Phase 3, Digital Traffic Enforcement System /Parking	Pipeline initiatives with the greatest contribution to TfL's strategic outcomes and that are most time critical have been prioritised for

	Enforcement Solution, TPH Assessment Centre Expansion and Planning Process Optimisation, delivering safety, customer, staff tools and financial outcomes and benefits. TfL- resourcing challenges have limited the number of projects initiated. This is mitigated and managed as part of ongoing pipeline prioritisation.	2024/25. Other initiatives will be monitored as opportunities should additional funding and resource become available. The initiatives deliver core outcomes across all OpsTech themes.

Appendix 3: 2023/24 Changes to EFC and rationales for significant differences in the Programme EFC by portfolio (all values in £m)

Portfolio	Current EFC (Period 9 2023/24)	Previous Submission EFC	Difference	Change (%)	Rationale for most significant changes
Payments	697.7	618.5	79.2	12.8%	N/A
Enterprise Resource Programme (ERP)	126.9	100.1	26.7	26.7%	Consolidated multiple business needs for ERP Central Programme Management and Business Recharges into one budget. Budget and delivery of the Operations Workforce Management was moved from Operations (London Underground (LU) and Surface) into T&D.
Networks	168.7	138.2	30.5	22.1%	N/A
Hosting	227.5	196.6	30.9	15.7%	N/A
Digital Workplace	91.1	70.8	20.3	28.7%	The costs required to modernise operational systems are significantly higher than forecast due to additional network complexity, increased obsolescence, and higher component costs. Some refresh and lifecycle costs were not accurately factored into the previous business plan.
Telecomms Commercialisation Programme (TCP)	9.1	8.6	0.6	6.5%	N/A
Technology Service Operations (TSO)	40.0	26.8	13.3	49.6%	Contract retendering for our core business critical services, the prioritisation of initiatives which are of

					strategic importance to the Mayor's Office, the introduction of new projects and the rephasing of our bigger project commitments into financial year 2024/25 and financial year 2025/26 following a pause to enable a review and amendment of their strategic directions to ensure the programme delivers value for money.
Cyber Security	102.5	138.9	(36.4)	(26.2%)	The reduction in forecast is due to the delivery constraints within the portfolio; the availability of key resources for project delivery in addition to Business-As-Usual operational activities.
Data Analytics	42.8	35.8	7.1	19.8%	N/A
T&D LU	52.8	53.0	(0.2)	(0.4%)	N/A
Digital	92.8	66.8	26.0	38.9%	We have been asked to accelerate the delivery of the TfL Go app's future functionality (with a focus on personalisation). We are also enhancing app payment functionality and expanding our core app delivery team.
T&D Surface Transport	64.4	84.4	(20.0)	(23.7%)	N/A
Contact Centre Operations (CCO)	19.0	13.9	5.1	36.5%	Increase due to costs associated with a re-tender and a new Concessions system.
Telecommunications	17.5	17.5	0.0	0%	N/A
Other Tech & Data	20.9	379.4	(358.6)	(94.5%)	N/A
Overprogramming	(102.4)	(85.0)	(17.4)	20.5%	N/A

Total T&D	1,671.3	1,864.2	(192.9)	(10.3%)	
Enforcement, Compliance, Safety & Security	151.0	156.8	(5.7)	(3.7%)	EFC changes across a number of projects due to deferral of projects/scope, commencement of new projects, commercial changes, transfer of projects within the portfolio and efficiency savings.
Network & Public Transport Management	337.1	323.2	13.9	4.3%	EFC changes across a number of projects due to increase/decrease in scope, extension of contracts, commercial savings, transfers of projects within the portfolio and efficiency savings.
Connectivity	212.2	172.7	39.4	22.8%	Scope and cost definition of Connectivity Asset Renewal Programme during early stage of project.
Tools for Planning, Automation and Staff	37.4	35.6	1.8	5%	Scope and cost definition of early-stage projects such as Sentinel and Performance Data Warehousing.
Cycling and Micro-Mobility	117.7	109.8	7.9	7.2%	Scope and cost definition of early-stage projects such as Cycle Hire Re-let, including commercial review and commencement of new Micro-Mobility projects.
Digital Asset Management	81.2	42.8	38.4	89.6%	Scope and cost definition of early-stage projects which were previously at initiation stage e.g. Digitising Asset Management programme and increased costs due to prolongation of delivery of Asset Management Information System project.

Transferred	0.2	1.2	(1.0)	(83.1%)	Transfer of Operational wi-fi and Stations and Buildings projects out of the portfolio.
Overprogramming	(164.1)	(160.4)	(3.7)	2.3%	N/A
Pipeline Projects	453.3	463.8	(10.4)	(2.2%)	N/A
Closed Projects	454.2	503.2	(49.0)	(9.7%)	Future Voice and Data Provision closed with £49m savings.
Total OpsTech	**1,680.1**	**1,648.6**	**31.5**	**1.9%**	
Total Technology	**3,351.4**	**3,512.8**	**(161.4)**	**(4.6%)**	

Note: Previous submission forecast spend is Period 10 financial year 2022/23 for T&D and Period 11 financial year 2022/23 (as used for the Budget) for OpsTech. Further detail, which includes commercially sensitive information, can be found on Part 2 of the agenda.

Appendix 4 – Breakdown of 2023/24 forecast spend (Period 9) against forecast at previous submission (£m)

Programme / Theme	2023/24 forecast at last submission	Period 9 2023/24 Actual / Forecast	Difference
Payments	91.88	58.19	(33.70)
Enterprise Resource Programme	15.15	12.14	(3.00)
Networks	12.81	12.97	0.16
Hosting	10.73	10.62	(0.11)
Digital Workplace	7.64	10.43	2.79
Telecomms Commercialisation Programme	6.06	3.83	(2.23)
Technology Service Operations	3.34	2.84	(0.51)
Cyber Security	6.80	4.54	(2.25)
Data Analytics	3.57	3.48	(0.09)
T&D LU	3.70	1.97	(1.74)
Digital	4.52	5.79	1.27
Surface Transport	2.33	0.86	(1.47)
Contact Centre Operations	1.01	0.74	(0.27)
Telecommunications	0.00	0.02	0.02

Other Tech & Data	3.67	(2.47)	(6.14)
Overprogramming	(14.50)	(0.10)	14.40
Total T&D	**158.72**	**125.85**	**(32.86)**
Enforcement, Compliance, Safety & Security	38.76	27.96	(10.80)
Network & Public Transport Management	50.60	32.03	(18.56)
Connectivity	10.81	6.67	(4.14)
Tools for Planning, Automation and Staff	11.86	6.68	(5.18)
Cycling and Micro-Mobility	12.66	5.39	(7.27)
Digital Asset Management	13.64	7.19	(6.45)
Pipeline	0.00	1.01	1.01
Transferred*	8.25	0.00	(8.25)
Overprogramming	(39.23)	(4.29)	34.95
Total OpsTech	**107.35**	**82.65**	**(24.70)**
Total Technology	**266.07**	**208.51**	**(57.56)**

Note: The previous submission forecast spend is from Period 10 of financial year 2022/23 for T&D and Period 11 of financial year 2022/23 (as used for the Budget) for OpsTech.

* Surface & LU Workforce Management Projects and the Connectivity wi-fi project. All of these projects transferred from OpsTech into T&D.