

Item: Technology and Data Programme 2018/19 and 2019/20

This paper will be considered in public

1 Summary

Technology and Data (T&D) Investment Programme 2018/19 and 2019/20				
Existing Financial Authority for 2018/19 and 2019/20	Estimated Final Cost for 2018/19 and 2019/20	Existing Programme and Project Authority for 2018/19 and 2019/20	Additional Authority Requested for 2018/19 and 2019/20	Total Programme and Project Authority for 2018/19 and 2019/20
£ 167.7m	£ 167.7m	£ 60m	£ 107.7m	£ 167.7m

- 1.1 This submission presents the strategic case for the overall Technology and Data (T&D) Investment Programme (the Programme). This authority covers financial years 2018/19 and 2019/20. The Programme will return annually to the Committee to renew and validate a rolling two year approval. This enables approvals to be aligned to financial years, which complements the nature of this Programme.
- 1.2 This paper describes the range of activities undertaken by TfL’s T&D team but the authority sought relates only to those matters for which Programme and Project Authority is required by T&D. The authority request does not include matters where T&D is closely involved in delivery but authorities are secured separately by Surface Transport or London Underground (LU) or matters funded by third parties and which have been specifically authorised (such as Emergency Services Network).

2 Recommendation

- 2.1 **The Committee is asked to note the paper and:**
 - (a) **approve additional Programme and Project Authority of £107.7m for delivery of the Technology and Data funded Investment Programme (£53.7m in 2018/19 and £54.0m in 2019/20 described in this paper); and**
 - (b) **note that Procurement Authority for the various initiatives in the Technology and Data Investment Programme described in this paper will be sought at officer level in accordance with Standing Orders.**

3 Background

- 3.1 The T&D directorate was launched in July 2017, bringing together teams from across TfL – including IM, Online, Customer Experience and the Technical Services Group – to form a new single function under the Chief Technology Officer and Director of Customer Experience, Shashi Verma.

- 3.2 A new target operating model was embedded after the implementation of the Transformation Programme to deliver a streamlined directorate with clear accountabilities and decision making responsibilities.
- 3.3 We have re-organised ourselves around a number of core portfolios and product families and this is reflected in our Programme to ensure complete transparency and clarity regarding where the funding is going to be invested. The portfolio/product families are described in more detail in Appendix 1.
- 3.4 Technology and data underpin everything TfL does and our activities span across the organisation. We provide technical specialist skills, cyber security and data analysis, as required by the business. On a day-to-day basis, we support over 2,000 applications and systems, over 30,000 active users and 11,000 servers on our estate. We also collect and process vast amounts of data daily, including 2m journeys made using contactless payment, 4.5m iBus geo-located events and 500,000 rows of train diagnostic data on the Central line alone.
- 3.5 We also have a track record of delivering significant benefits for TfL and its customers. For example:
- (a) we continue to innovate and improve ticketing to provide customers with an integrated and seamless experience. The TfL Oyster app, which was launched in September 2017, removes a pain point for customers by allowing them to check their Oyster balance and make purchases from anywhere. To date, more than 500,000 customers have downloaded the app and it was the number one app on the UK Apple App Store on 1 November 2017;
 - (b) we provide personalised customer service to millions of customers every day on our transport network and in our Contact Centres. For the fifth year running, our core Contact Centre based in North Greenwich ranked in the UK's Top 50 contact centres for telephony, email and social media channels, competing against over 300 companies from a variety of sectors; and
 - (c) we have generated secondary revenue for TfL by striking a deal with Cubic Transportation Systems in July 2016, where we agreed to licence our world-class contactless ticketing system for up to £15m (as was approved by the Finance and Policy Committee in July 2016). By bridging the gap between public transport ticketing and banking industry standards, we helped create a new market for our product. Cubic has since been successful in selling new fare collection systems that re-use our intellectual property to Miami, New York and Boston and is exploring many more opportunities.
- 3.6 In addition to T&D-funded initiatives, we support every other directorate in TfL in delivering their own projects where they carry a technology or data component. For example, we are supporting London Underground (LU) to assess options and plan for the replacement or implementation of two safety-critical Underground communications networks:
- (a) Connect, a digital radio system used by all front-line staff that helps minimise disruptions on the network and assist emergency services during incidents; and

- (b) the Emergency Services Network (ESN), which is owned and funded by the Home Office and will form part of a UK-wide network used by emergency services once operational.

3.7 Other examples include work with Surface Transport on:

- (a) Cycle Hire, where T&D is managing and delivering a replacement payment system to process all customer payments; and
- (b) Ultra Low Emission Zone, where T&D is assuring the technical proposal from the supplier (Capita) and assisting the Programme team with web and mobile integration.

4 Strategic Case

4.1 The draft Mayor's Transport Strategy was published for public consultation in June 2017. It sets out the Mayor's ambitions to improve transport in London over the next 25 years by delivering:

- (a) Healthy Streets and Healthy People;
- (b) a good public transport experience; and
- (c) new homes and jobs.

4.2 To ensure the successful delivery of the Mayor's Transport Strategy outcomes, TfL has set six strategic priorities:

- (1) To put customers and users at the core of all our decision making;
- (2) To drive improvement in reliability and safety across our network;
- (3) To accelerate the growth and increase the capacity of our network;
- (4) To invest in our people and lead them to be the best they can be every day;
- (5) To cost less and to generate more income; and
- (6) To exploit technology to produce better and faster results

4.3 T&D provides the core infrastructure, services and enabling technologies that allow TfL to deliver its six priorities. The Programme is cognisant of this and of TfL's duty to deliver the Mayor's Transport Strategy outcomes.

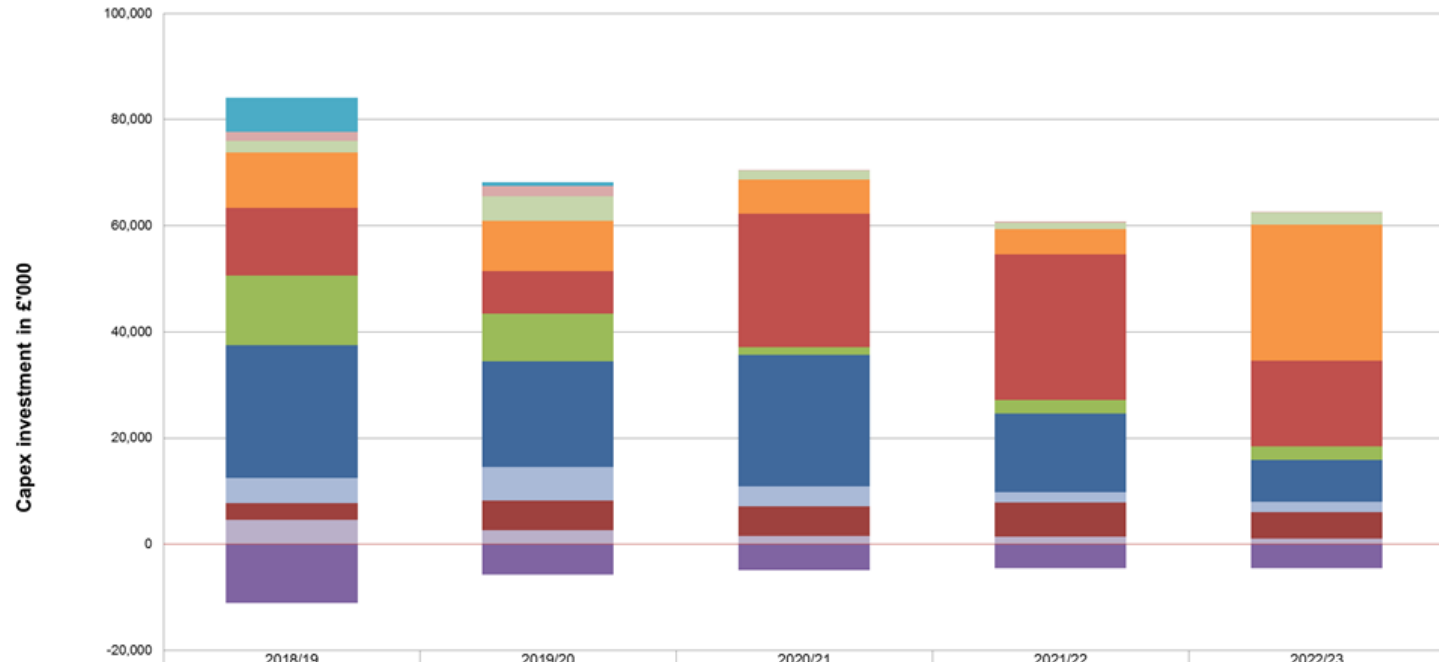
4.4 For example, the funding set out in the Programme will allow us to improve the ways we host, transfer and analyse data across the organisation. Doing so will ensure that business-led initiatives that support the Mayor's Transport Strategy outcomes, such as the Surface Intelligent Transport System (SITS) programme, can be delivered efficiently and sustainably going forward.

4.5 We will also invest in our assets, such as desktops, laptops and remote login facilities to enable the pan-TfL Smart Working initiative. This ensures staff have the right tools to do their jobs and the flexibility to work from any location, as best suited to their work.

4.6 Finally, we will maintain and enhance applications and systems which are critical to the day-to-day operations of TfL. This includes, for example, SAP, the core Enterprise Resource Planning (ERP) tool used to manage HR, Finance and other back-office processes.

- 4.7 Broadly speaking, the funding requested in this paper falls within two categories: (A) refresh of technology assets and core infrastructure, and (B) technology transformation programmes.
- 4.8 In order to assess and prioritise all of the initiatives that were included in the Programme, we adopted a consistent approach to ensure that all investment identified helps deliver the six priorities. This can be summarised as:
- (a) analyse the existing landscape to identify areas of potential improvement and opportunities to drive down cost and better exploit technology;
 - (b) set a strategy that seeks to address inefficiencies by removing duplications, consolidating and streamlining processes and services where possible;
 - (c) review service levels to ensure they are fit for purpose, with our customers and users at the heart of all our decision making; and
 - (d) apply best practice to deliver and realise benefits.
- 4.9 Every initiative included in the Programme has been assessed rigorously on its criticality, benefits and impacts on the business, to ensure that we only invest in what is essential for TfL and its customers.
- 4.10 As the landscape of technology evolves in future, T&D may be required to make additional investments to meet the changing needs of our business. Any additional Programme and Project Authority and Procurement Authority will be sought in accordance with TfL's Standing Orders, including through requests to this Committee.

4.11 Table 1 sets out how the Programme funding is split across the largest portfolios over the life of the Business Plan 2017/18.



	2018/19	2019/20	2020/21	2021/22	2022/23
Hosting - Data Centre Rationalisation and Cloud Migration	6,393	649	-	-	-
Cyber Security	1,695	1,970	180	180	180
Data & Analytics	2,280	4,620	1,650	1,300	2,300
Tech Refresh, Maintenance of Applications & Operations of Service (TSO)	10,456	9,438	6,426	4,630	25,554
Bus Operating and Monitoring Systems	12,664	7,988	25,179	27,551	16,250
Networks - Consolidation of Data Transmission	13,166	9,058	1,500	2,500	2,500
Revenue Collection System Investment	25,016	19,937	24,692	14,861	7,939
End User Computing (desktop, laptop, mobile)	4,663	6,225	3,848	1,863	1,878
Enterprise Resource Planning (ERP) – mostly retain and enhance SAP	3,175	5,660	5,500	6,500	5,000
Other investments	4,618	2,618	1,571	1,388	1,048
Credit returned to T&D from previous Data Centre Consolidation Project*	-11,060	-5,690	-4,940	-4,480	-4,480
Capital Investment Programme	84,126	68,163	70,546	60,773	62,649
Payments - DCC Investment Fund*	-11,060	-5,690	-4,940	-4,480	-4,480
Total funding required by T&D	73,066	62,473	65,606	56,293	58,169

Table 1. T&D Investment Programme by portfolio in Business Plan 2017/18

**Note: this item captures the credit returned to TfL from Cubic as a result of savings from the consolidation of data centres for ticketing systems. This fund can only be used to fund Cubic-facing projects.*

(A) Investment in Technology Assets and Core Infrastructure

- 4.12 Maintaining the service levels, tools and technologies TfL needs every day is a significant endeavour and this is reflected in the Programme, where the majority of the investment is for asset, infrastructure and technology refresh.
- 4.13 Assets typically have to be refreshed every five years. This is because of deterioration and the fact that older models become increasingly unlikely to meet required changes in compliance and business needs over time. While some assets can continue to perform beyond their standard lifecycle, supporting costs often rise and quickly become unsustainable.
- 4.14 Our Programme will, among others items, fund the refresh of: revenue collection assets (e.g. ticket gates and readers), data centre servers, network assets and end-user computing assets (e.g. desktops, phones, etc.)
- 4.15 Many of these assets will continue to be managed and maintained as part of T&D's business-as-usual activities to ensure they are performing at the required levels of service as per TfL scorecard. Below are the target service performance levels we are responsible for:

Services Measure in TfL Scorecard	Target Level of Service
Oyster Reader availability, measured by	
% of time that LU and Rail ticket system is available	98.20%
% of time that bus ticket system validation is available	99.00%
Customer Call Centre effectiveness, measured by	
% of calls answered before abandoned	85.00%
% of correspondence closed within Service Level Agreement (three days or 10 days if investigation required)	80.00%
TfL website availability, measured by	
% of time that TfL website is available, including access to revenue collection systems (excluding planned outages)	99.95%
Internal IT systems availability, measured by	
% of time that internal systems are available	99.60%

- 4.16 This refresh investment is essential to maintain service levels. It will also help mitigate operational risks.
- 4.17 Obsolescent devices and platforms carry risks of malware infiltrating our system, defects within applications not being fixed by the supplier and difficulties sourcing cost-effective compatible hardware. All of these can be mitigated by adequately investing in asset refresh and keep obsolescence levels as low as is practicable.
- 4.18 Given the current financial climate, the Programme's asset refresh profile has been prioritised against risks and impacts of not investing at this time. Going forward we will continue to explore ways to reduce asset refresh costs. For example, we have consolidated our ticketing data centres to reduce the costs of hosting and asset refresh. We are also proposing to transform the End User Computing (EUC) hardware refresh programmes from the expensive waterfall approach (every five to six years) to a continual delivery model to reduce overhead costs.

Bus Technology Programme

- 4.19 The London bus network supports over 6.5m passenger journeys every day with 19,500 bus stops and over 9,000 vehicles; one of the largest metropolitan bus networks in the world. TfL is responsible for the service planning, real time information, ticketing service and performance management of the bus network through performance-based contracts worth £2bn p.a. The operation and resources (buses, drivers and facilities) for the bus network are delivered by the Bus Operating Companies (BOCs).
- 4.20 The Bus Technology Programme is primarily an asset refresh and enhancement programme which ensures that the systems underpinning these TfL functions, many of which are currently aging or life expired, are not fit for purpose and unable to meet business needs. In doing so, the programme delivers against the following Mayor's Transport Strategy outcomes:
- **A Good Public Transport Experience (Reliable and Quality Service)** – the continuity in service and performance management functionality delivered by the programme protects against degradation in bus speeds and journey time reliability. The programme will also ensure TfL is able to continue providing accurate, real-time information, and improve customer information during disruption and delays.
 - **Healthy Streets and Healthy People (Safety)** – the programme will deliver a critical communications network able to meet the capacity demands of the bus fleet, enabling effective management of safety critical situations. In addition, it will deliver safety enhancing technology, such as Intelligent Speed Adaptation.
- 4.21 The programme will also help minimise TfL's costs by ensuring continuity in the systems enabling assessment of the BOCs performance, and consequently calculating contractual payments. Without these systems, TfL would need to pay BOCs the maximum contractual values or reintroduce costly manual performance surveys, either of which would lead to significantly increased costs.

(B) Investment in Technology Transformation

- 4.22 Another significant proportion of our investment will be focused on the change programmes or technology transformation that support TfL, especially initiatives to better exploit technology and data to deliver benefits for the business.
- 4.23 Due to the ongoing Transformation taking place across TfL and T&D's own work to embed the new structure, the change programme initiatives identified in our Programme are currently at different levels of maturity.
- 4.24 Portfolios such as Hosting, Networks, Payment, Cyber Security, Surface Buses, Contact Centre Operation (CCO) and Technical Service Operation (TSO) have clear strategies in place with well defined plans to deliver the committed benefits and savings.

- 4.25 Some projects within these portfolios have already obtained relevant Project Authority and have therefore been excluded from this authority request. Please refer to Section 5.3 and Appendix 2 for further details.
- 4.26 For the remaining portfolios – including Data and Analytics, EUC, ERP, Asset Management and Content & Collaboration – there are still opportunities to be explored to deliver further improvements. We will continue to seek engagement with and input from the business to finalise the strategies for these portfolios. However, in the meantime, we have established interim solutions to progress with any immediate improvements identified.

5 Proposal

- 5.1 This section sets out the Programme and Project Authority sought in this submission for 2018/19 and 2019/20, split by portfolio.
- 5.2 This authority covers financial years 2018/19 and 2019/20. T&D will provide quarterly updates on the Programme and will return annually to the Programmes and Investment Committee to renew and validate a rolling two year approval. This enables approvals to be aligned to financial years, which complements the nature of this Programme.

5.3 **Table 2. Programme and Authority Overview by Portfolio** (a more detailed breakdown is set out in Appendix 2).

Portfolio	Activity and Key Deliverables in 2018/19 and 2019/20	Existing Authority (£m)		This Authority Request (£m)		
		Financial Authority for 2018/19 - 2022/23 (£m)	Remaining Project Authority for 2018/19 - 2022/23 (£m)	2018/19	2019/20	Total
Payments – Revenue Collection Asset Investment	Service Delivery Assurance – this is spend TfL has already committed to under the Revenue Collection Contract for our supplier, Cubic, to assure the performance of ticketing assets, and to maintain and upgrade these assets in line with their contractual obligations. <i>(Full authority obtained)</i>	53.0	53.0	0	0	0
Payments – Enhancements to Oyster and the Revenue Collection System	<p>Complete the delivery of the Mayoral commitments on Oyster capping and Bus Hopper, enhancements to deliver previously committed savings and provide fare collection solutions for the Crossrail extension to Reading.</p> <p>More specifically:</p> <ul style="list-style-type: none"> • Complete the Future Ticketing Programme Phase 4 (FTP4) – enhancement to Oyster ticketing and Ticketing App <i>(Full authority obtained)</i> • Complete the development of a New Reader (The Hermes Reader) for operational use <i>(Full authority obtained)</i> • Implementation of new Fares Model for the Elizabeth Line • Automation of Oyster route charges to generate fares for Crossrail • Initiate 1G Oyster Migration by introducing on-system changes to remove 1st generation cards from circulation • Start Designing the new Revenue Inspection Device (RID) 	39.4	12.6	1.2	5.4	6.6

Payments – Credit returned to TfL	This is credit returned to TfL from Cubic as a result of savings made from consolidating Cubic's and TfL's data centres for ticketing systems. This fund can only be applied to variations placed with Cubic under the Revenue Collection Contract.	-30.1	N/A	N/A	N/A	N/A
Enterprise Resource Programme (ERP) – mostly retain and enhance SAP	Retain SAP ERP as-is and deliver the following improvements: <ul style="list-style-type: none"> • ERP Finance Master Data – standardise the financial accounts structure in ERP to enable consistent reporting of financial information • Occupational Health Process – improve process flow, reduce dependency on numerous workarounds and reduce costs • Financial Services Centre (FSC) Transformation Programme – a series of minor technology solutions to improve FSC processes • Legacy Portal Migration – retire the legacy portal so that users have one place to review and approve all ERP interactions. • Initiate the development of Change & Release Management tool to control and automate the release of SAP configuration. • Initiate the development of ERP Data Scrambling (TDMS) tool to encrypt, randomise and scramble ERP data • Initiate ERP Cloud Hosting migration and start the preparation for Managed Services retender & SAP S4 upgrade (Cloud SaaS) 	25.8	0	3.2	5.7	8.8

<p>Surface Buses – Bus Operating and Monitoring Systems</p>	<p>Deliver a number of key procurements to replace and upgrade current bus technology systems:</p> <ul style="list-style-type: none"> • Surface Narrow Band Radio Replacement – a safety critical project to replace the Bus radio system. The current system and assets have come to their end of life and the contract has been extended through derogation. <i>(Full authority will be obtained before PIC meeting)</i> • Initiate iBus2 – to replace our bus tracking, performance management and real time bus passenger information system, the contract for which cannot be extended past 2022. <i>(Part authority obtained)</i> • Future Bus Systems – Current bus routes and schedules systems are life expired and already extended by Single Source Justification (SSJ). Loss of these systems would result in a) the inability to manage bus operator performance and b) out-of-date network information and therefore passenger information. This would lead to increased costs due to higher contract payments to operators and significantly degraded customer information. <i>(Full authority obtained for Phase 1)</i> 	89.6	13.2	1.0	6.9	7.9
<p>Networks – Consolidation of Data Transmission</p>	<p>Deliver the new mobile and data network contracts and invest in consolidating our multiple networks leading to costs savings, improved security and stable performance. Key deliveries include:</p> <ul style="list-style-type: none"> • Access and Wide Area Networks (WAN) contract transition and transformation • Mobile Network procurement and transition. • Network tech refresh – refresh the DC(a) network equipment <i>(Part authority obtained)</i> • Data Centre Networks (DCN) – procurement of a third-party service for operational and ongoing duties of managing the DCN • This portfolio will generate savings of £32m over the business plan 	28.7	0.3	12.8	9.1	21.9
<p>Hosting – Data Centre Rationalisation and Cloud Migration</p>	<p>Reduce TfL's footprint at our Data Centre leading to savings and establish a Cloud presence through a phased migration of services (to be exploited tactically over time). Key activities include:</p> <ul style="list-style-type: none"> • Decommissioning of retired services – decommission servers (c.1,000) that were identified as part of the Rapid Discovery Assessment completed by Cloudreach • Data Centre Footprint Reduction Phase 2 & 3 – the migration of remaining services in scope (Storage and Migration) • Complete Early migrations for Cloud Hosting for selected services <p><i>(Full authority obtained for all above)</i></p>	7.0	7.0	0.0	0.0	0.0

End User Computing (EUC) Products – desktop, laptop, mobile, other	<p>Transform EUC by moving away from expensive waterfall programmes every 5-6 years to upgrade our desktop software and hardware to a continuous refresh/ update model. This will lower our overall total cost of ownership, negate the need for future large Capex change programmes and support the pan-TfL Smart Working Programme. Invest in Office 365 (Cloud based product) and Windows 10 upgrade that delivers savings and a compliance requirement. More specifically:</p> <ul style="list-style-type: none"> • Design and build modern desktop platform compatible with TfL's core applications, migrate Windows 7 and thin client users to a new modern desktop • Office 365 deployment – deploy Office 2016 to desktops, migrate workloads for email, email archive, skype for business and home drives to Office365's cloud tenancy. Includes support for business change and user migration • Mobile Management in-housing migration – deployment and migration of a new mobile device management capability • Continuous Desktop hardware refresh – purchase and deploy new end-point devices to users • Pull printing expansion – expand the use of the managed print service contract to provide printers in additional locations • Investment to support Back Office Telephony business case to rationalise the back-office telephony solution. • Enable Skype For Business Online across all sites (only for internal consumption for video links and voice (ON NET) and not for external video conferencing) 	18.5	0	4.7	6.2	10.9
Contact Centre Operation (CCO)	Review and improve the Lost Property Service. Re-tender and transition of the telephony self-serve contracts and Concessions contracts.	2.5	0	1.9	0.6	2.5
Cyber Security	Improve and deliver the cyber security capabilities required to lower the strategic cyber risk to our target levels (by 2020/21) while achieving savings. The majority of the investment is for procuring replacement or new tools to meet the latest business requirements, such as Digital Forensics tool, Data Loss Prevention tool, and network security monitoring & modelling tool, etc.	4.2	0	1.7	2.0	3.7
Tech Refresh – Investment in our Data Centre Servers	Technology Infrastructure Refresh: Replacement of a fifth of all HP physical servers (Compute) every year for five years.	33.1	0	1.9	2.0	4.0

<p>Technical Service Operation (TSO) – Maintenance of Applications & Operations of Service</p>	<p>Continue to ensure the day to day provision of IT services that deliver the required business outcomes cost effectively by:</p> <ul style="list-style-type: none"> • Improving service resiliency across shared platforms • Consolidation of outsourced IT services through Sourcing strategy • Operating System & Database Upgrades – tech refresh • Completing Data Centre Rationalisation for remaining sites – migrate and/or decommission services from legacy data centres to target hosting solution where there is deemed to be operational risk or service no longer required. • Migration and integration of JNP infrastructure and support • Cloud/Hosting Target Operating Model – develop new operating model to support a hybrid operating model (on premise and cloud/hosted) • Review and deploy Licence Management strategy • Infrastructure Monitoring Migration (Infrastructure & Service Operations). <i>(Full authority obtained)</i> • IT Service Management tool to log, create, manage and escalate IT related incidents 	23.4	0.8	7.9	7.2	15.1
<p>Data & Analytics</p>	<p>Continue to exploit and integrate our data to enable faster and better decision-making across the business by:</p> <ul style="list-style-type: none"> • Enhancing TfL self-service reporting capability. This directly impacts on financial and performance reporting across TfL (e.g. London Underground business objective reports) • Digital Marketing cloud – service to send emails to customers and for any enhancements in personalisation and alerting • Future enhancements to the Origin Destination Interchange Tool (ODX, infers Bus Journeys on our Network) to help better plan our bus network. This has already been baked into Surface's Transformation plan for buses, including savings for on-street surveys etc. • Provision for General Data Protection Regulation (GDPR) • Investment in Data Science – generating more efficiency in working, and improving our ability to run reports 	12.2	0	2.3	4.6	6.9

Asset Management Products	Develop a business case in order to deliver wider benefit pan-TfL. <i>Note: T&D will not be investing in any asset management system transformation or upgrades. Any transformational change to the asset management systems will have to be driven and funded by LU and Surface Transport.</i>	0.05	0	0.05	0	0.05
Content & Collaboration Products	Consolidate and upgrade pan-TfL document management and collaborations systems to improve end user performance, reduce technical failures and provide better access to information. Key deliveries include: <ul style="list-style-type: none"> • Legacy SharePoint consolidation • Essential upgrade to Livelink, the document collaboration tool for London Underground • Develop a strategy to clear the 'digital landfill' to improve efficiency and document management maturity 	3.0	0.2	1.0	1.0	2.0
Access & Networks Management Products	Refresh of Computerised Track Access Control (CTAC) application. It is a safety-related, business critical application, which we are contractually committed with the supplier to provide them with safe and secure access to London Underground track for essentially maintenance. <i>(Full authority obtained)</i>	0.5	0.5	0	0	0
Small Works		5.1	0	1.0	1.0	2.0
Unallocated		7.4	0	13.2	2.2	15.4
Total		323.0	87.6	53.7	54.0	107.7

6 Authorities sought

6.1 Financial Implications: a summary of the T&D Business Plan and Investment Programme from 2018/19 to 2022/23 is shown in Table 3.

Table 3. Summary of the T&D Investment Programme Costs and Funding

	Portfolio		Business Plan Year					Total
	Rounded to £m		2018/19	2019/20	2020/21	2021/22	2022/23	
Cost	Investment Programme Total	(A)	84.1	68.2	70.5	60.8	62.6	346.3
Funding	Financial Authority from Adjusted Business Plan	(B)	86.3	64.7	68.9	68.6	34.6	323.0
	Other funding - Credit from Cubic	(C)	11.1	5.7	4.9	4.5	4.5	30.7
	Actual funding required from T&D	(D) = (A - C)	73.1	62.5	65.6	56.3	58.2	315.6
Variance	Unallocated	(V) = (B - D)	13.2	2.2	3.3	12.3	- 23.6	7.4
Authority	Existing Project Authority	(E)	43.6	16.4	12.2	7.6	7.9	87.6
	Unallocated	(V)	13.2	2.2	3.3	12.3	- 23.6	7.4
	This Project Authority request	= (A - E) + (V)	53.7	54.0	-	-	-	107.7
	Future Project Authority request	= (A - E) + (V)	-	-	61.7	65.5	31.1	158.3

- 6.2 The T&D funded Investment Programme includes an unallocated contingency of £13.2m in 2018/19 and £2.2m in 2019/20. This contingency will be utilised to fund:
- (a) new risks and/or additional scope items, not allowed for in the individual programme estimates, that materialise in-year and require the overall programme to be adjusted accordingly; and
 - (b) the ability to flex planned delivery to accommodate movements in the programmes.

The use of this contingency will be managed by T&D in accordance with Standing Orders.

- 6.3 This submission seeks Programme and Project Authority for a total of £107.7m for delivery of the T&D funded Investment Programme (£53.7m in 2018/19 and £54m in 2019/20).
- 6.4 The Procurement Authority for the various initiatives in the Programme will be sought at officer level and in accordance with Standing Orders.

7 Assurance

- 7.1 TfL Project Assurance conducted an Integrated Assurance Review (IAR) on the T&D Programme in January 2018.
- 7.2 The objective of the IAR was to assess the Programme's readiness to deliver its outcomes. The IAR followed nine lines of inquiry to answer the challenge of "Is the Programme sufficiently well managed for the Programme and Investment Committee to award authority?"
- 7.3 There were no critical issues identified through the IAR. All recommendations have been accepted.

List of appendices to this paper:

- Appendix 1 High level summary for each portfolio and product families
Appendix 2 Detailed breakdown of Authority Request

List of background papers:

- IIPAG and Project Assurance Reports
Management response to IIPAG and Project Assurance Reports

Contact Officer: Shashi Verma, Chief Technology Officer
Number: 020 3054 4001
Email: ShashiVerma@tfl.gov.uk

As noted in the Background, our Programme is aligned to the T&D portfolios and product families' structure. Below is a high level summary of what they are and what they seek to deliver:

I. Payments – Investment in Revenue Collection Systems:

We will deliver a secure and compliant ticketing system, deliver a better customer proposition and reduce revenue collection costs. We will continue to maintain and upgrade revenue collection assets to assure their service performance.

II. Enterprise Resource Planning (ERP):

ERP incorporates the processes we use to conduct our 'back office' activities. We will invest to retain and re-platform the existing system (mostly SAP) in order to support the ongoing improvement of our HR, Finance and Supply Chain business processes.

III. Surface Buses – Bus Operating and Monitoring Systems:

Surface Buses investment includes the delivery of a radio network scaled to allow effective communication in critical scenarios thus improving the safety of our network; and a suite of Bus Technology Programmes to upgrade the aging technology estate to ensure the performance of the bus network is maintained and the quality of customer information improves.

Note: Due to the ongoing Surface Transport Transformation, the Buses Technology budget currently sits within T&D but its governance is controlled by the Public Transport Portfolio Board and its delegated Technology Board, both of which are part of Surface Transport.

T&D has included the request for Project Authority for the Buses Technology budget in this paper. However, in practice, any spend will be authorised by the Public Transport Portfolio Board and sent to the T&D Board for ratification.

IV. Networks:

A data network governs how we transfer data. We will invest to establish a unified, interconnected data network shared by our entire organisation, by minimising the duplication of network footprints and cost-effectively consolidating services to reduce costs.

V. Hosting - Data Centre Rationalisation and Cloud Migration:

Hosting is how we organise, process, store and disseminate large amounts of data. We aim to provide a flexible, scalable and agile hosting model that allows us to adapt to changing business needs. Savings are realised from reduced data centre lease costs and lower infrastructure refresh costs.

- VI. **End User Computing (EUC):**
EUC includes desktops, laptops, mobiles, telephony, etc. We need to move away from expensive waterfall programmes every 5-6 years to upgrade our desktop software and hardware to a continuous refresh/ update model. This will lower our overall TCO for EUC, negate the need for future large Capex programmes of change and supports the pan-TfL Smart Working Programme.
- VII. **Contact Centre Operation (CCO):**
CCO operate a number of established customer service businesses through a number of channels including telephony, email, social media and face-to-face. We will invest with the aim to reduce the ongoing cost of operation while maintaining the current service level.
- VIII. **Cyber Security:**
We aim to lower the strategic cyber risk to our target levels (by 2020/21), and therefore invest to increase our ability to prevent, identify and respond to threats across our network, devices and users by putting in place more advanced monitoring covering a higher proportion of our network.
- IX. **Tech Refresh and Technical Service Operation (TSO):**
TSO ensure the day to day provision of suitable IT services, including operational-critical applications and investment to refresh our Data Centre Servers. Embed proactive performance management to maximise service continuity and availability, and reduce costs by tighter financial controls, contract optimisation and removing service duplication.
- X. **Data & Analytics:**
We collect, manage and deploy data in order to drive evidence-based decision making. We will continue to exploit transport data that drives operational performance, supports future planning, and provides our customers with data services and information while complying with data regulations.
- XI. **Asset Management Products:**
We will develop a business case to identify how best to provide the appropriate asset management tools to drive efficiencies, safety and statutory obligations, and reduce the number and cost of asset management solutions across TfL.
- XII. **Content & Collaboration Products:**
We will invest to consolidate and upgrade pan-TfL document management and collaboration systems, such as SharePoint and Livelink to ensure business continuity. We will develop a strategy to clear the 'digital landfill' to improve efficiency and document management maturity.
- XIII. **Access & Networks Management Products:**
We will invest to maintain and upgrade business and safety critical applications such as Computerised Track Access Control to ensure safe and secure access to LU track for essentially maintenance.

A	B	C	J	K	L	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
Draft Budget - Combination of Latest Forecast (W11) & as per 17/18 Business Plan	New ID	Portfolio/Product family	Programme/Project Name	Total	Opex / Capex	Finance Business Partner/ Source	Notes/ Assumption	SAP Authority	Existing Authority	Prior Year Spend	2017/18	Remaining Authority	2018/19	2019/20	2020/21	2021/22	2022/23	2018/19	2019/20	2020/21	2021/22	2022/23	Total	2018/19	2019/20	2020/21	2021/22	2022/23	Total												
Original	Tech Refresh	Tech Refresh - Tech Ref Hardware (including FTP, RCC & Cycle Hire) - 2022/23	12,060	Capex	Li Ma	No Project authority submission		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Original	Tech Refresh	Tech Refresh - Infrastructure Refresh - Compute	10,349	Capex	Kaye Haywood	No Project authority submission		0	0	0	0	0	1949	2008	2068	2130	2194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Original	Tech Refresh	Tech Refresh - Infrastructure Refresh- Storage Backup & SAN	10,658	Capex	Kaye Haywood	No Project authority submission		0	0	0	0	0	0	0	1858	0	8800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Original	EUC	Skype for Business (network enablement)	150	Capex	Kaye Haywood	No Project authority submission		0	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	F5 BIG-IP Management Pack	25	Capex	Kaye Haywood	No Project authority submission		0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	IT Sourcing Strategy (Infrastructure & Operations (TSO))	1,350	Opex	Kaye Haywood	No Project authority submission - Gate 0 approved		0	0	0	0	0	650	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	Operating System & Database Upgrades	12,500	Capex	Li Ma	No Project authority submission		0	0	0	0	0	2500	2500	2500	2500	2500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	Datacentre Rationalisation - Remaining Sites	1,400	Capex	Maggie Hi	Current scope for CX01TEC.023 (G1406) Data Centre Consolidation) is expected to complete in 2017/18 with EFC to date of £2627k - PY £2386k and FY 2018 £237k. Approved funding for this scope is £2600k. MH: Additional scope to current inflight project required more authority.	2602	2602	2386	237	-21	700	700	0	0	0	0	0	0	0	0	0	0	-21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	JNP Integration	2,200	Capex	Kaye Haywood	No Project authority submission - Gate 0		0	0	0	0	0	1500	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	Service Resiliency Improvements	2,120	Capex	Kaye Haywood	No Project authority submission - Gate 0		0	0	0	0	0	1120	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	Cloud/Hosting Target Operating Model	580	Capex	Li Ma	No Project authority submission		0	0	0	0	0	580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	Licence Management	830	Capex	Kaye Haywood	No Project authority submission - Gate 0		0	0	0	0	0	200	630	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	Oracle: Commercial Approach	193	Opex	Kaye Haywood	No Project authority submission - Gate 0		0	0	0	0	0	193	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	Remote Access Consolidation & Migration of Load Balancers	30	Capex	Kaye Haywood	WBS: CX01TEC.024	920	920	683	198	39	39	0	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Adjust - Inflight	Infrastructure & Operations (TSO)	Remote Access Consolidation & Migration of Load Balancers	9	Capex	Kaye Haywood	WBS: CX01TEC.024	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	
Original	Infrastructure & Operations (TSO)	Infrastructure Monitoring Migration (Infrastructure & Service Operations)	800	Capex	Kaye Haywood	WBS: CX01TEC.036	900	900	15	85	800	600	200	0	0	0	0	0	0	0	0	0	0	600	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Infrastructure & Operations (TSO)	IT Service Management (ITSM) Toolset	1,400	Capex	Kaye Haywood/ Maggie Hi	No Project authority submission for delivery (There is Gate 0 approved for spend in 17/18 only.)		0	0	0	0	0	400	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Original	Surface Buses	Radio Replacement	9,284	Capex	Business contact: Alexander Thomas Finance - Maggie Hi	Procurement in progress, in process to go for project authority for its complete delivery costs on ahead of Feb PIC. MH - updated with latest Forecast phasing - CT PJ006C	190k in SAP W11, but will obtain full authority before PIC	10276.3	34.8	1603	8638.5	8606	30.5	0	0	0	0	0	0	0	0	0	0	8606	30.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Adjust - Inflight	Surface Buses	Radio Replacement	4	Capex	Finance - Maggie Hi	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged		
Adjust - CFwd Inflight	Surface Buses	Radio Replacement	844	Capex	Finance - Maggie Hi	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged		
Original	Surface Buses	IBus2 (back office)	36,704	Capex	Business contact: Alexander Thomas Finance - Maggie Hi	Has some Project Authority, see email from AT 30/11/17 MH - updated with latest Forecast phasing - CT PJ004C	SAP to be updated	555	640	431.7	208.3	0	750	3,576	23,963	27,289	15,979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Original	Surface Buses	IBus2 (Mts+garages)	26,225	Capex	Alexander Thomas	No Project authority submission		0	0	0	0	0	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	
Original	Surface Buses	IBus2 (Ticketing)	8,000	Capex	Alexander Thomas	No Project authority submission		0	0	0	0	0	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	
Adjust - Inflight	Surface Buses	IBus 2	451	Capex	Finance - Maggie Hi	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged		
Adjust - CFwd Inflight	Surface Buses	IBus 2	177	Capex	Finance - Maggie Hi	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged		
Original	Surface Buses	FBS (Future Bus Systems)	6,645	Capex	Business contact: Alexander Thomas Finance - Maggie Hi	AT - Has Project Authority for Phase 1, but need authority for Phase 2, and 3) MH - updated with latest Forecast phasing - CT PJ005C; includes carry forward from 2017/18	SAP to be updated	1250	5823	741	523	4559	3123	4187	1006	0	0	0	0	0	0	0	0	3058	1052	444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Adjust - Inflight	Surface Buses	FBS (Future Bus Systems)	453	Capex	Finance - Maggie Hi	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged		
Adjust - CFwd Inflight	Surface Buses	FBS (Future Bus Systems)	2,124	Capex	Finance - Maggie Hi	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged		
Original	Surface Buses	BPS (Bus Systems Result)	1,122	Capex	Alexander Thomas Finance - Maggie Hi	No Project authority submission MH - updated with latest Forecast phasing - CT PJ002C	Need to seek annual authority	1292	1292	0	522	770	185	194	210	262	271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Original	Surface Buses	IBus PVR & Garage Results	-	Capex	Sang Thoonq	This is an annualised programme and is only budgeted in 2017/18	N/A	495	0	495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Original	Payments - CUBIC Service Delivery Assurance	Payments - CUBIC Service Delivery Assurance	53019	Capex	Li Ma/ Aman Miah	No project authority - But this is BAU Capex relating to asset improvement, not project per se. This is already committed in the RCC contract. Project - FP-PJ42C	N/A	53019	0	0	0	53019	13606	12151	11762	7561	7939	0	0	0	0	0	0	0	13606	12151	11762	7561	7939	53019	0	0	0	0	0	0	0	0	0	0	
Original	Payments - DCC Investment Fund	Payments - DCC Investment Fund	-30650	Capex	Li Ma/ Aman Miah	No project authority - But this is BAU Capex relating to asset improvement, not project per se. This is already committed in the RCC contract. Project - FP-PJ42C	N/A	N/A	N/A	N/A	N/A	N/A	-11060	-5690	-4940	-4480	-4480	0	0	0	0	0	0	0	-11060	-5690	-4940	-4480	-4480	-30650	0	0	0	0	0	0	0	0	0		
Original	Data & Analytics	Data & Analytics - TL self-service reporting capability	930	Capex	Li Ma/ Aman Miah	No Project authority submission		0	0	0	0	0	280	300	350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Original	Data & Analytics	Data & Analytics - GDPR	3,250	Capex	Kaye Haywood/ Maggie Hi	No Project authority submission for delivery (There is Gate 0 approved for spend in 17/18 only.)		0																																	

	A	B	C	J	K	L	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1	Draft Budget - Combination of Latest Forecast (W11) & as per 17/18 Business Plan													Forecast in Jan 2018					Profile by project with adj merged					*Valid* remaining authority (if value is equal to zero, we need to ask for full authority)					Additional Authority Required					
2	New ID	Portfolio/Product family	Programme/Project Name	Total	Opex / Capex	Finance Business Partner/ Source	Notes/ Assumption	SAP Authority	Existing Authority	Prior Year Spend	2017/18	Remaining Authority	2018/19	2019/20	2020/21	2021/22	2022/23	Check	2018/19	2019/20	2020/21	2021/22	2022/23	Total	2018/19	2019/20	2020/21	2021/22	2022/23	Total				
41	Original	Data & Analytics	Data & Analytics - ODX Future Enhancements	1,350	Capex	Li Ma	No Project authority submission	0	0	0	0	0	150	300	300	300	300	ok	0	0	0	0	0	0	150	300	300	300	300	1,350				
42	Original	CCO	CCO - Eckoh Self Serve Contract re-tender	179	Opex	Li Ma	No Project authority submission	0	0	0	0	0	88.5	90	0	0	0	ok	0	0	0	0	0	0	88.5	90	0	0	0	178.5				
43	Original	CCO	CCO - Eckoh IVR Contract re-tender	180	Opex	Li Ma	No Project authority submission	0	0	0	0	0	90	90	0	0	0	ok	0	0	0	0	0	0	90	90	0	0	0	180				
44	Original	CCO	CCO - Batch 1 and 3 re-tender (potential 2 contracts that add up to the 60%)	18	Opex	Li Ma	No Project authority submission	0	0	0	0	0	0	9	9	0	0	ok	0	0	0	0	0	0	0	9	9	0	0	0	18			
45	Original	CCO	CCO - Batch 2 re-tender	18	Opex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	18	0	0	ok	0	0	0	0	0	0	0	0	18	0	0	0	18			
46	Original	CCO	CCO - Batch 4 re-tender	20	Opex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	20	0	0	ok	0	0	0	0	0	0	0	0	20	0	0	0	20			
47	Original	CCO	CCO - Mystery Shopping re-tender	-	Opex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
48	Original	CCO	CCO - CCO Chat	-	Capex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
49	Original	CCO	CCO - SAP CRM Replacement CCO CRM Efficiencies	-	Opex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
50	Original	CCO	CCO - Lost Property Service Review	1,390	Opex	Li Ma	No Project authority submission	0	0	0	0	0	962	428	0	0	0	ok	0	0	0	0	0	0	962	428	0	0	0	1,390				
51	Original	CCO	CCO - Contact Centre Services Framework - Outsourcing Batch 5 & 6	7	Opex	Li Ma	No Project authority submission	0	0	0	0	0	7	0	0	0	0	ok	0	0	0	0	0	0	7	0	0	0	0	7				
52	Original	CCO	CCO - Concessions Contract Re-Tender	711	Opex	Rags		0	0	0	0	0	711	0	0	0	0	ok	0	0	0	0	0	0	711	0	0	0	0	711				
53	Original	Networks	Networks - Access Networks & WAN Managed Service - Transition and Transformation	29,500	Capex	Adam Hills Maggie Hill	MH - updated with latest Forecast phasing - CS-PJ118C	0	3150.2	0	3150.2	0	11759	8500	1000	2500	2500	ok	0	0	0	0	0	0	11759	8500	1000	2500	2500	26259				
54	Adjust - CFwd Inflight	Networks	Networks - Access Networks & WAN Managed Service - Transition and Transformation	3,241	Capex	Adam Hills Maggie Hill	MH - updated with latest Forecast phasing - CS-PJ118C	merged	merged	merged	merged	merged	merged	merged	merged	merged	merged	ok	merged	merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0			
55	Original	Networks	Networks - Equinox Cloud-UX Replacement	10	Opex	Kaye Heywood / Adam Hills	No Project authority submission	0	0	0	0	0	10	0	0	0	0	ok	0	0	0	0	0	0	10	0	0	0	0	0	10			
56	Original	Networks	DC(a) Network Tech Refresh	333	Capex	Daran Rowland (replaced with Rajesh ...) Maggie Hill	Email from Daran on 29/11/17, no project authority for this at the moment - we have submitted a funding request through the Gate0 process that is being reviewed on 30/11/17 MH: Gate 0 approved for 567k in Dec 17	SAP to be updated	567	0	80	487	820	0	0	0	0	ok	333	0	0	0	0	333	487	0	0	0	0	487				
57	Adjust - CFwd New	Networks	DC(a) Network Tech Refresh	487	Capex	Daran Rowland (replaced with Rajesh ...) Maggie Hill	for this at the moment - we have submitted a funding request through the Gate0 process that is being reviewed on 30/11/17 MH: Gate 0 approved for 567k in Dec 17	SAP to be updated	merged	merged	merged	merged	merged	merged	merged	merged	merged	ok	merged	merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0			
58	Original	Networks	Networks - DCN Management Sourcing Project	260	Opex	Adam Hills	No Project authority submission	0	0	0	0	0	260	0	0	0	0	ok	0	0	0	0	0	0	260	0	0	0	0	260				
59	Original	Networks	Networks - Mobile Sourcing Project	1,375	Opex	Adam Hills	No Project authority submission	0	0	0	0	0	317	558	500	0	0	ok	0	0	0	0	0	0	317	558	500	0	0	1,375				
60	Original	CSIRT	CSIRT - Digital Forensics Tool (Encase)	340	Capex	Li Ma	No Project authority submission	0	0	0	0	0	340	0	0	0	0	ok	0	0	0	0	0	0	340	0	0	0	0	340				
61	Original	CSIRT	CSIRT - Risk & Threat Modelling Tool	123	Capex	Li Ma	No Project authority submission	0	0	0	0	0	123	0	0	0	0	ok	0	0	0	0	0	0	123	0	0	0	0	123				
62	Original	CSIRT	CSIRT - Key / Certificates Management	137	Capex	Li Ma	No Project authority submission	0	0	0	0	0	137	0	0	0	0	ok	0	0	0	0	0	0	137	0	0	0	0	137				
63	Original	CSIRT	CSIRT - Enterprise Encryption (SafeNet)	90	Capex	Li Ma	No Project authority submission	0	0	0	0	0	90	0	0	0	0	ok	0	0	0	0	0	0	90	0	0	0	0	90				
64	Original	CSIRT	CSIRT - Firewall Monitoring & Analysis	150	Capex	Li Ma	No Project authority submission	0	0	0	0	0	150	0	0	0	0	ok	0	0	0	0	0	0	150	0	0	0	0	150				
65	Original	CSIRT	CSIRT - Network Security Monitoring & Modelling	1,510	Capex	Li Ma	No Project authority submission	0	0	0	0	0	35	1475	0	0	0	ok	0	0	0	0	0	0	35	1475	0	0	0	1,510				
66	Original	CSIRT	CSIRT - Threat Intelligence (Cyjax)	60	Capex	Li Ma	No Project authority submission	0	0	0	0	0	60	0	0	0	0	ok	0	0	0	0	0	0	60	0	0	0	0	60				
67	Original	CSIRT	CSIRT - Awareness	15	Capex	Li Ma	No Project authority submission	0	0	0	0	0	15	0	0	0	0	ok	0	0	0	0	0	0	15	0	0	0	0	15				
68	Original	CSIRT	CSIRT - Vulnerability Manager (Qualys)	34	Capex	Li Ma	No Project authority submission	0	0	0	0	0	34	0	0	0	0	ok	0	0	0	0	0	0	34	0	0	0	0	34				
69	Original	CSIRT	CSIRT - Data Loss Prevention	365	Capex	Li Ma	No Project authority submission	0	0	0	0	0	50	315	0	0	0	ok	0	0	0	0	0	0	50	315	0	0	0	365				
70	Original	CSIRT	CSIRT - Pen Testing	30	Capex	Li Ma	No Project authority submission	0	0	0	0	0	30	0	0	0	0	ok	0	0	0	0	0	0	30	0	0	0	0	30				
71	Original	CSIRT	CSIRT - London Underground Security Monitoring (Starting w/Victoria Line)	-	Capex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
72	Original	CSIRT	CSIRT - London Underground Security Monitoring (other lines)	400	Capex	Li Ma	No Project authority submission	0	0	0	0	0	80	80	80	80	80	ok	0	0	0	0	0	0	80	80	80	80	80	400				
73	Original	CSIRT	CSIRT - End Point Security of Critical OT Asset Base	184	Capex	Li Ma	No Project authority submission	0	0	0	0	0	184	0	0	0	0	ok	0	0	0	0	0	0	184	0	0	0	0	184				
74	Original	CSIRT	CSIRT - Removal Media Protection - Operational Control Rooms (SheepClp)	40	Capex	Li Ma	No Project authority submission	0	0	0	0	0	40	0	0	0	0	ok	0	0	0	0	0	0	40	0	0	0	0	40				
75	Original	CSIRT	CSIRT - Network Information Systems EU Directive	105	Opex	Li Ma	No Project authority submission	0	0	0	0	0	105	0	0	0	0	ok	0	0	0	0	0	0	105	0	0	0	0	105				
76	Original	CSIRT	CSIRT - National Rail / Light Rail Security Programme DfT Regulation	72	Opex	Li Ma	No Project authority submission	0	0	0	0	0	72	0	0	0	0	ok	0	0	0	0	0	0	72	0	0	0	0	72				
77	Original	CSIRT	CSIRT - Incidence Response Tooling	-	Capex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
78	Original	CSIRT	CSIRT - Security Web Gateway (Forcepoint)	-	Capex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
79	Original	CSIRT	CSIRT - Malware Protection	-	Capex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
80	Original	CSIRT	CSIRT - Incident Response Services	50	Capex	Li Ma	No Project authority submission	0	0	0	0	0	50	0	0	0	0	ok	0	0	0	0	0	0	50	0	0	0	0	50				
81	Original	CSIRT	CSIRT - SIEM Tool (SPLUNK)	-	Capex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
82	Original	CSIRT	CSIRT - Web Application Security Monitoring (CloudFlare)	-	Capex	Li Ma	No Project authority submission	0	0	0	0	0	0	0	0	0	0	ok	0	0	0	0	0	0	0	0	0	0	0	0	0			
83	Original	CSIRT	CSIRT - Ironbridge Cyber Resilience	500	Capex	Li Ma	No Project authority submission	0	0	0	0	0	100	100	100	100	100	ok	0	0	0	0	0	0	100	100	100	100	100	500				

	A	B	C	J	K	L	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1	Draft Budget - Combination of Latest Forecast (W11) A as per 17/18 Business Plan													Forecast in Jan 2018					Profile by project with adj merged					*Valid* remaining authority (if value is equal to zero, we need to ask for full authority)					Additional Authority Required					
2	New ID	Portfolio/Product family	Programme/Project Name	Total	Opex / Capex	Finance Business Partner/ Source	Notes/ Assumption	SAP Authority	Existing Authority	Prior Year Spend	2017/18	Remaining Authority	2018/19	2019/20	2020/21	2021/22	2022/23	Check	2018/19	2019/20	2020/21	2021/22	2022/23	Total	2018/19	2019/20	2020/21	2021/22	2022/23	Total				
175				323,027									86,262	64,655	68,944	68,578	34,589		32,534	10,699	7,266	3,081	3,459	57,039	53,728	53,956	61,678	65,497	31,130	265,989				

	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
1	Detailed summary of Enhanced Business Plan												"Valid" remaining authority						Additional Authority Required							
2	New ID	Portfolio/Product family	Programme/Project Name	Description	2018/19	2019/20	2020/21	2021/22	2022/23	Total	Opex / Capex		2018/19	2019/20	2020/21	2021/22	2022/23	Total		2018/19	2019/20	2020/21	2021/22	2022/23	Total	
28	Original	Surface Buses	FBS (Future Bus Systems)	* Future Bus Systems (Routes and Schedules function only) - Current bus routes and schedules systems are life expired and already extended by SSJs. Loss of these systems would result in a) inability to manage bus operator performance b) out of date network information and therefore passenger information. This would lead to increased costs due to higher contract payments to operators and significantly degraded customer	3,752	1,604	1,289	-	-	6,645	Capex		3058	1052	444	0	0	4554		65	3135	562	0	0	3762	
29	Adjust - Inflight	Surface Buses	FBS (Future Bus Systems)	Inflight variances	-	629	-	283	-	-	453	Capex	merged	merged	merged	merged	merged	0		merged	merged	merged	merged	merged	0	
30	Adjust - C/Fwd Inflight	Surface Buses	FBS (Future Bus Systems)	Carry forward from 2017/18	-	2,124	-	-	-	2,124	Capex	merged	merged	merged	merged	merged	0			merged	merged	merged	merged	merged	0	
31	Original	Surface Buses	BPS (Bus Systems Result)	* Bus Performance Systems - used for early stage PoCs to inform requirements for major projects such as iBus2 and Countdown 3 as well as some spend to save initiatives and innovation trials.	185	194	210	262	271	1,122	Capex		0	0	0	0	0	0		185	194	210	262	271	1122	
32	Original	Surface Buses	iBus PVR & Garage Results	iBus PVR & Garage Results	-	-	-	-	-	-	Capex		0	0	0	0	0	0		0	0	0	0	0	0	
33	Original	Payments - CUBIC Service Delivery Assurance	Payments - CUBIC Service Delivery Assurance	Payments - CUBIC Service Delivery Assurance (committed contract costs)	13,606	12,151	11,762	7,561	7,939	53,019	Capex		13606	12151	11762	7561	7939	53019		0	0	0	0	0	0	
34	Original	Payments - DCC Investment Fund	Payments - DCC Investment Fund	DCC Investment Fund - funding for Cubic projects & services	-	11,060	-	5,690	-	4,940	-	4,480	-	4,480	-	4,480	-	-30,650	Capex	-11060	-5690	-4940	-4480	-4480	-30650	
35	Original	Data & Analytics	Data & Analytics - TFL self-service reporting capability	Must. Can't delay as TFL areas are asking for us to build a platform for new reports, and we need to do so in order to avoid extra costs of supporting multiple new systems.	280	300	350	-	-	930	Capex		0	0	0	0	0	0		280	300	350	0	0	930	
36	Original	Data & Analytics	Data & Analytics - GDPR	This is a pan-T&D provision for GDPR including a portion of the Data Analytics technical debt programme as required for business critical reporting. Also includes other elements under ERP (£500k) and Payments (de-identified current contract with Daimler ends in May 2018, and cannot be extended via SSJ. Provision has been put in place to provide a bare minimum service to send emails to customers. There will be savings by reducing the budget costs (£150k per year paid to Daimler) by	1,250	2,000	-	-	-	3,250	Capex		0	0	0	0	0	0		1250	2000	0	0	0	3250	
37	Original	Data & Analytics	Data & Analytics - Digital Marketing Cloud	Re-tender of the telephony self-serve tools, contract award and transition to new contract.	400	300	-	-	-	700	Capex		0	0	0	0	0	0		400	300	0	0	0	700	
38	Original	Data & Analytics	Data & Analytics - Technical refresh	Revise figures from £1m to £220k in 19/20 (remove this amount from Opex budget, total £1.22m)	-	720	-	-	1,000	1,720	Capex		0	0	0	0	0	0		0	720	0	0	1000	1720	
39	Original	Data & Analytics	Data & Analytics - Funding used to further enhance the existing project to provide wider benefits	This is for enhancements to work Analytics are undertaking that would have a benefit to the wider TFL if there was slightly more funding to support project costs	100	500	500	500	500	2,100	Capex		0	0	0	0	0	0		100	500	500	500	500	2100	
40	Original	Data & Analytics	Data & Analytics - Data Science	Cutting this would mean less efficiency in working, it will be slower and lose ability to run some reports.	100	500	500	500	500	2,100	Capex		0	0	0	0	0	0		100	500	500	500	500	2100	
41	Original	Data & Analytics	Data & Analytics - ODX Future Enhancements	Allocation of funding to support future enhancements to ODX to help better plan our network. This has already been baked into Surface's Transformation plan for	150	300	300	300	300	1,350	Capex		0	0	0	0	0	0		150	300	300	300	300	1350	
42	Original	CCO	CCO - Eckoh Self Serve Contract re-tender	Re-tender of the telephony self-serve tools, contract award and transition to new contract.	89	90	-	-	-	179	Opex		0	0	0	0	0	0		88.5	90	0	0	0	178.5	
43	Original	CCO	CCO - Eckoh IVR Contract re-tender	Re-tender of the IVR Management Contract, contract award and transition to new contract.	90	90	-	-	-	180	Opex		0	0	0	0	0	0		90	90	0	0	0	180	
44	Original	CCO	CCO -Batch 1 and 3 re-tender (potential 2 contracts that add up to the 60%)	Re-tender of the L&S, Telesales, and % of Adult Oyster telephony work, contract award and transition to new contract.	-	9	9	-	-	18	Opex		0	0	0	0	0	0		0	9	9	0	0	18	
45	Original	CCO	CCO -Batch 2 re-tender	Re-tender of the % of Adult Oyster telephony work, contract award and transition to new contract.	-	-	18	-	-	18	Opex		0	0	0	0	0	0		0	0	18	0	0	18	
46	Original	CCO	CCO -Batch 4 re-tender	Re-tender of the Cycle Hire contact offering, contract award and transition to new contract.	-	-	20	-	-	20	Opex		0	0	0	0	0	0		0	0	20	0	0	20	
47	Original	CCO	CCO -Mystery Shopping re-tender	Re-tender of the Mystery shopping, Exit survey and Quality audit tools and services, contract award and transition to new contract.	-	-	-	-	-	-	Opex		0	0	0	0	0	0		0	0	0	0	0	0	
48	Original	CCO	CCO -CCO Chat	to save initiative, as proven within the contact centre industry.	-	-	-	-	-	-	Capex		0	0	0	0	0	0		0	0	0	0	0	0	
49	Original	CCO	CCO - SAP CRM Replacement CCO CRM Efficiencies	(6260) Replacing CCO SAP CRM with MS Dynamics and (6792) Identifying new opportunities and delivering efficiencies made possible by the new MS Dynamics	-	-	-	-	-	-	Opex		0	0	0	0	0	0		0	0	0	0	0	0	
50	Original	CCO	CCO - Lost Property Service Review	This project is to review of the lost property service to look for operational scalability, efficiencies and cost reduction. make a recommendation for the future of the 1 to use the Contact Centre Service Framework to outsource batches of CCO work in order to make OPEX savings. Current scope for Batch 5 is Oyster	962	428	-	-	-	1,390	Opex		0	0	0	0	0	0		962	428	0	0	0	1390	
51	Original	CCO	CCO - Contact Centre Services Framework - Outsourcing Batch 5 & 6	Re-tender of the Concessions Scheme Management Contract, contract award and transition to new contract.	7	-	-	-	-	7	Opex		0	0	0	0	0	0		7	0	0	0	0	7	
52	Original	CCO	CCO - Concessions Contract Re-Tender	Re-tender of the Concessions Scheme Management Contract, contract award and transition to new contract.	711	-	-	-	-	711	Opex		0	0	0	0	0	0		711	0	0	0	0	711	
53	Original	Networks	Networks - Access Networks & WAN Managed Service - Transition and Transformation	Source a new managed network service contract that will provide the platform on to which TFL will consolidate its approximately 30 commodity network service contracts. Resource cost to support, shadow and assure the transition activities carried out by the new supplier	15,000	8,500	1,000	2,500	2,500	29,500	Capex		0	0	0	0	0	0		11759	8500	1000	2500	2500	26259	
54	Adjust - C/Fwd Inflight	Networks	Networks - Access Networks & WAN Managed Service - Transition and Transformation	Brought forward to 2017/18 - approved at Gate 0 including Connect	-	3,241	-	-	-	3,241	Capex	merged	merged	merged	merged	merged	0			merged	merged	merged	merged	merged	0	
55	Original	Networks	Networks - Equinix Cloud-IX Replacement	Replacement of CIX platform to ECX platform. Equinix's CIX service ends on 30/06/18. Service is used to connect to the Microsoft Azure and Amazon AWS public cloud environments and connectivity is used by Digital, ST, LU, Customer Technology, Application Hosting, and EUC and is critical for future Application Hosting and EUC transformation as well.	10	-	-	-	-	10	Opex		0	0	0	0	0	0		10	0	0	0	0	10	
56	Original	Networks	DC(a) Network Tech Refresh	Refresh is required for continuity of service and minimise security risk and extended outages. Much of the network equipment at DC(a) is already out of vendor support and more than 90% of network equipment in DC(a) will be out of vendor support by the end of 2019.	333	-	-	-	-	333	Capex		333	0	0	0	0	0	333		487	0	0	0	0	487

	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
1	Detailed summary of Enhanced Business Plan											"Valid" remaining authority						Additional Authority Required								
2	New ID	Portfolio/Product family	Programme/Project Name	Description	2018/19	2019/20	2020/21	2021/22	2022/23	Total	Opex / Capex		2018/19	2019/20	2020/21	2021/22	2022/23	Total		2018/19	2019/20	2020/21	2021/22	2022/23	Total	
91	Original	Payments	FTP Phase 4: CPC Capacity Improvements		0	250	250	-	-	-	500	Capex	250	250	0	0	0	0	500	0	0	0	0	0	0	
92	Original	Payments	FTP Phase 4: Apple Pay etc on App		0	-	-	-	-	-	-	Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	
93	Original	Payments	FTP Phase 4: App enhancements		0	-	-	-	-	-	-	Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	
94	Original	Payments	FTP Phase 4: Contingency		0	-	-	-	-	-	-	Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	
95	Original	Payments	FTP Phase 4: Analytics		0	1,440	-	-	-	-	1,440	Capex	1440	0	0	0	0	0	1440	0	0	0	0	0	0	
96	Adjust - Inflight	Payments	FTP Phase 4 :	Missing inflight work packages		3,694	646	-	-	-	4,340	Capex	3694	646	0	0	0	0	4340	0	0	0	0	0	0	
97	Adjust - C/Fwd Inflight	Payments	FTP Phase 4 :	Carry forward from 2017/18		124	-	-	-	-	124	Capex	124	0	0	0	0	0	124	0	0	0	0	0	0	
98	Original	Payments	Cash in Transit Retender	The Contract for Cash in Transit and Cash Processing with G4S Solutions is to expire on 25 February 2018 following a 2 year extension to incorporate the rollout of Security concerns, and the need to future-proof Oyster cards, have initiated an investigation into the activity required to migrate the remaining MiFare Classic Cards		-	-	-	-	-	-	Opex	0	0	0	0	0	0	0	0	0	0	0	0	0	
99	Original	Payments	POM to Web Service Interface	Hermes is the first project within a roadmap to deliver a New Reader (The Hermes Reader) for operational TTL use		-	-	-	-	-	-	Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	
100	Original	Payments	HERMES	Hermes is the first project within a roadmap to deliver a New Reader (The Hermes Reader) for operational TTL use		678	-	-	-	-	678	Capex	784	0	0	0	0	0	784	120.08698	0	0	0	0	0	120.08698
101	Adjust - Inflight	Payments	HERMES	Inflight variances		226	-	-	-	-	226	Capex	merged	merged	merged	merged	merged	0	0	merged	merged	merged	merged	merged	0	
102	Original	Payments	RFIS Stabilisation	Stabilisation of Rail Fares Implementation System - Migrate from an outdated, out of support platform to a new solution in line with hosting strategy, so that ongoing		11	-	-	-	-	11	Capex	0	0	0	0	0	0	0	11	0	0	0	0	0	11
103	Original	Payments	POM Enhancements	The project comprises two installations works: 1) Reduced QBM Functionality for RSLU; and 2) Portuguese on POMs		-	-	-	-	-	-	Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	Original	Payments	Digital Oyster	doing work on Digital Oyster - the idea of having the Oyster card in your phone is coming through strongly in feedback on the app		-	-	1,000	-	-	1,000	Capex	0	0	0	0	0	0	0	0	0	1000	0	0	1000	
105	Original	Payments	RID2	Procurement and/or development of a replacement for the current revenue inspection device which is out of support and cannot be used after December 2020		180	1,070	3,000	5,750	-	10,000	Capex	0	0	0	0	0	0	0	180	1070	3000	5750	0	10000	
106	Original	Payments	FTP Phase 5	Phase 1: Simplifying the legacy Oyster system - initial phase: reducing the cost of sale by making more transactions online only through integration Oyster on		-	-	-	-	-	-	Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	
107	Original	Payments	New Reader for Bus	Deployment of the New Reader (Hermes) on buses including a complete re-build and simplification of the reader software		-	2,020	7,880	-	-	9,900	Capex	0	0	0	0	0	0	0	0	2020	7880	0	0	9900	
108	Original	Payments	New Mayoral Initiatives	Provision for manifesto commitments eg a TFL cap		-	-	-	-	-	-	Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	
109	Original	Payments	OOL Modernisation	Phases 2 &3: Decommission Opus - exit Rackspace		-	-	-	1,050	-	1,050	Capex	0	0	0	0	0	0	0	0	0	0	1050	0	1050	
110	Original	Payments	RFIS Replacement Phase 2 & 3	Rail Fares Implementation System (RFIS). Automation of Oyster route charges. Phase 2 is a dependency for Point to Zone, to be able to		-	1,000	-	-	-	1,000	Capex	0	0	0	0	0	0	0	0	1000	0	0	0	1000	
111	Adjust - Inflight New	Payments	Ticketing Vending Machine (TVM) Development	NEW - Not on original list - Inflight variance		538	-	-	-	-	538	Capex	833	0	0	0	0	0	833	0	0	0	0	0	0	
112	Adjust - C/Fwd New	Payments	Ticketing Vending Machine (TVM) Development	Carry forward from 2017/18		295	-	-	-	-	295	Capex	merged	merged	merged	merged	merged	0	0	merged	merged	merged	merged	merged	0	
113	Original	Payments	Delinking expired credit cards	Compliance to GDPR. Once a contactless card expires, we need to delink the PAN from the token. The time when this occurs is that as		250	-	-	-	-	250	Capex	0	0	0	0	0	0	0	0	250	0	0	0	0	250
114	Original	Payments	Photocards on app	Include Photocard association for concessions in the App for Oyster inc proof of eligibility		-	-	-	-	-	-	Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	
115	Original	Payments	Point to Zone	Implementation of new Fares Model for the Elizabeth Line. Dependence on RFIS Phase 2, to generate fares data		600	600	-	-	-	1,200	Capex	0	0	0	0	0	0	0	600	600	0	0	0	0	1200
116	Original	Payments	1G Oyster Migration Strategy	Funding for on-system changes (on TVM and POMs but not Xpert devices) to force swapout of 1st gen cards. Depends on approach - soft campaign based on		-	750	750	-	-	1,500	Capex	0	0	0	0	0	0	0	0	750	750	0	0	0	1500
117	Original	Payments	Improved Refunds - Service Delay Refunds	Improved refunds including automatic service delay refunds, more autofill, better service disruption management		-	-	-	500	-	500	Capex	0	0	0	0	0	0	0	0	0	0	500	0	500	
118	Original	Payments	Polymer Notes (£20)	Changes to revenue collection systems to accept new £20 notes		-	-	300	-	-	300	Capex	0	0	0	0	0	0	0	0	0	300	0	0	300	
119	Original	ERP	ERP - FINANCE Master Data	To standardise the company account code structure in ERP to enable consistent reporting of financial information.		1,550	-	-	-	-	1,550	Capex	0	0	0	0	0	0	0	1820	0	0	0	0	0	1820
120	Adjust - C/Fwd Inflight	ERP	ERP - FINANCE Master Data	Carry forward from 2017/18 - Gate 0		270	-	-	-	-	270	Opex	merged	merged	merged	merged	merged	0	0	merged	merged	merged	merged	merged	0	
121	Original	ERP	ERP - Occupational Health Process Improvement & Application Rationalisation	To Improve process flow, reduce dependency on numerous workarounds and reduce costs.		685	-	-	-	-	685	Capex	0	0	0	0	0	0	0	685	0	0	0	0	0	685
122	Original	ERP	ERP TECH - Legacy Portal Migration	To retire the legacy portal so that users have one place to review and approve all ERP interactions. This will yield has technology support savings as it removes		100	-	-	-	-	100	Opex	0	0	0	0	0	0	0	170	0	0	0	0	0	170
123	Adjust - C/Fwd Inflight	ERP	ERP TECH - Legacy Portal Migration	Carry forward from 2017/18 - Gate 0		70	-	-	-	-	70	Opex	merged	merged	merged	merged	merged	0	0	merged	merged	merged	merged	merged	0	
124	Original	ERP	ERP - FSC Transformation Programme	A series of technology solutions to improve FSC processes.		500	-	-	-	-	500	Capex	0	0	0	0	0	0	0	500	0	0	0	0	0	500
125	Original	ERP	ERP Change & Release Management Tool	Tool to control and automate the release of SAP configuration.		-	150	-	-	-	150	Capex	0	0	0	0	0	0	0	0	150	0	0	0	0	150
126	Original	ERP	ERP Data Scrambling (TDMS)	Tool to encrypt, randomise and scramble ERP data. Likely to be essential post GDPR.		-	200	-	-	-	200	Capex	0	0	0	0	0	0	0	0	200	0	0	0	0	200
127	Original	ERP	ERP - Cloud Hosting migration	Drive savings out of SAP hosting (£3.5m p.a) by hosting the current application configuration in the Cloud.		-	1,500	1,000	-	-	2,500	Opex	0	0	0	0	0	0	0	0	1500	1000	0	0	0	2500
128	Original	ERP	ERP - Managed Services retender & SAP S4 upgrade (Cloud SaaS)	The SAP Managed Services contract expires June 2019. This is onludes hosting and application management. This initiative would retender that contract covering		-	3,810	4,500	4,350	2,850	15,510	Capex	0	0	0	0	0	0	0	0	3810	4500	4350	2850	0	15510
129	Original	ERP	ERP - S4 enhancements (Cloud SaaS)	Essential business driven enhancements post Cloud migration in 2020		-	-	-	2,150	2,150	4,300	Capex	0	0	0	0	0	0	0	0	0	0	2150	2150	0	4300

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1	Detailed summary of Enhanced Business Plan											"Valid" remaining authority						Additional Authority Required							
2	New ID	Portfolio/Product family	Programme/Project Name	Description	2018/19	2019/20	2020/21	2021/22	2022/23	Total	Opex / Capex		2018/19	2019/20	2020/21	2021/22	2022/23	Total	2018/19	2019/20	2020/21	2021/22	2022/23	Total	
130	Original	Infrastructure & Hosting	App Hosting - Footprint Reduction - Phase 1	This project will shrink TFL's presence in DC(a) by approx. 60% and consolidate all infrastructure and services into Module 1 before the current lease end date (July 2019) which will allow us to negotiate a new lease agreement for a smaller footprint which will reduce our annual lease costs by circa £4m per annum..	-	-	-	-	-	-	Opex		0	0	0	0	0	0	0	0	0	0	0	0	
131	Original	Infrastructure & Hosting	App Hosting - Footprint Reduction Phase 2 & 3	Migration of remaining services (Storage and Migration) with a dependency on the Module 1 Expansion. Dilapidations of Mod 2 and 3	1,621	247	-	-	-	1,868	Capex		2398	210	0	0	0	2608	0	39	0	0	0	39	
132	Adjust - Inflight	Infrastructure & Hosting	App Hosting - Footprint Reduction Phase 2 & 3	Inflight variances Phase 1	152	2	-	-	-	154	Capex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
133	Adjust - C/Fwd Inflight	Infrastructure & Hosting	App Hosting - Footprint Reduction Phase 2 & 3	Carry Forward from 2017/18	625	-	-	-	-	625	Capex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
134	Original	Infrastructure & Hosting	App Hosting - Discovery & Assessment	An in-depth analysis of the 467 services in scope to determine: - Whether the service is still required.	-	-	-	-	-	-	Opex		0	0	0	0	0	0	0	0	0	0	0	0	
135	Original	Infrastructure & Hosting	App Hosting - Pilot	Migration of 4 services to Azure and AWS	128	-	-	-	-	128	Opex		75	0	0	0	0	75	0	0	0	0	0	0	
136	Adjust - Inflight	Infrastructure & Hosting	App Hosting - Pilot	Inflight variances	53	-	-	-	-	53	Opex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
137	Original	Infrastructure & Hosting	App Hosting - Decommission of Retired Services	As part of the Rapid Discovery Assessment completed by Cloudreach, over 1000 servers have been identified to retire. These servers will go through further analysis to	85	-	-	-	-	85	Opex		182	0	0	0	0	182	0	0	0	0	0	0	
138	Adjust - Inflight	Infrastructure & Hosting	App Hosting - Decommission of Retired Services	Inflight variances	97	-	-	-	-	97	Opex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
139	Original	Infrastructure & Hosting	Application Hosting - Early Migrations	Early Migration of services to the Public Cloud Service providers (circa 10 services)	1,380	-	-	-	-	1,380	Capex		1463	322	0	0	0	1785	0	0	0	0	0	0	
140	Adjust - Inflight	Infrastructure & Hosting	Application Hosting - Early Migrations (Capex)	Inflight variances	270	-	-	-	-	270	Capex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
141	Adjust - Inflight	Infrastructure & Hosting	App Hosting - Early Migrations (opex)	Inflight variances	353	322	-	-	-	675	Opex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
142	Original	Infrastructure & Hosting	App Hosting - Mass Migrations (Option 4c)	Remaining services migrating to the cloud and on prem services migrating to a new DC. Removed as potential saving is not strongly evident.	-	-	-	-	-	-	Capex		0	0	0	0	0	0	0	0	0	0	0	0	
143	Original	Infrastructure & Hosting	App Hosting - Enterprise Service Hub Phase 2 and 1	Develop TFL's ability to host applications in the public cloud using Microsoft's Azure or Amazon Web Services (AWS) to fulfil the T&D core technology vision: "Technology will be delivered faster and cheaper, by removing duplication and moving to the cloud where appropriate allowing scalability for services based on demand at a lower cost."	251	-	-	-	-	251	Capex		457	77	0	0	0	534	0	1	0	0	0	1	
144	Adjust - Inflight	Infrastructure & Hosting	App Hosting - Enterprise Service Hub Phase 2 and 1	Inflight variances	76	-	-	-	-	76	Capex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
145	Adjust - Inflight	Infrastructure & Hosting	App Hosting - Enterprise Service Hub Phase 2 and 1	Inflight variances	130	78	-	-	-	208	Opex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
146	Original	Infrastructure & Hosting	Data Centre Rationalisation	Decommission internet link, final network migrations and decommissioning in Global Switch	-	-	-	-	-	-	Capex		0	0	0	0	0	0	0	0	0	0	0	0	
147	Original	Infrastructure & Hosting	Hosting - Data Centre Consolidation	Cost reduction in the technology refresh of the Cubic infrastructure. Standardisation and simplification of the technology stack that supports the ticketing platform leading to reduction in faults and reduction in OPEX through less people, reduction in training and common technology skills and knowledge.	145	-	-	-	-	145	Capex		145	0	0	0	0	145	0	0	0	0	0	0	
148	Adjust - C/Fwd New	Infrastructure & Hosting	Data Centre Hardware Refresh	NEW - Carry Forward from 2017/18	1,673	-	-	-	-	1,673	Capex		1673	0	0	0	0	1673	0	0	0	0	0	0	
149	Original	Asset Management	Asset Management	Asset Management - Upgrade Strategic AMIS System & Readiness for migration to Readiness system pan-TFL	50	-	-	-	-	50	Capex		0	0	0	0	0	0	50	0	0	0	0	50	
150	Original	Content & Collaboration	Content & Collaboration - Legacy SharePoint consolidation	TFL has a SharePoint estate that includes a significant number of sites in older versions of SharePoint	50	100	150	140	-	440	Opex		0	0	0	0	0	0	50	100	150	140	0	440	
151	Original	Content & Collaboration	Content & Collaboration - Document management strategy and consolidation	TFL has 1.2Tb of unstructured data hosted in datacentres that are mainly shared drive content. The future direction is to host the majority of unstructured data in the cloud	50	250	250	200	-	750	Opex		0	0	0	0	0	0	50	250	250	200	0	750	
152	Original	Content & Collaboration	Content & Collaboration - Project Server consolidation	TFL uses different versions and configurations of MS Project Server, which need consolidating and enabled to support a coherent strategy and approach around	-	150	100	-	-	250	Opex		0	0	0	0	0	0	0	150	100	0	0	250	
153	Original	Content & Collaboration	Content & Collaboration - Livelink upgrade	Livelink (aka TDM, TFL Document Manager)	600	-	-	-	-	600	Opex		0	0	0	0	0	0	600	0	0	0	0	600	
154	Original	Access & Networks Management	Computerised Track Access Control (CTAC)	This system is a booking system for the crews that carry out the maintenance of the LU rail network. The system is operated by the TAC Office, Network Planning and	500	-	-	-	-	500	Capex		531	0	0	0	0	531	0	0	0	0	0	0	
155	Adjust - C/Fwd Inflight	Access & Networks Management	Computerised Track Access Control (CTAC)	Carry forward from 2017/18	31	-	-	-	-	31	Capex		merged	merged	merged	merged	merged	0	merged	merged	merged	merged	merged	0	
156	Original	Content & Collaboration	Content & Collaboration - TFL Intranet Replacement	Replacement of TFL Intranet	500	500	-	-	-	1,000	Capex		200	0	0	0	0	200	300	500	0	0	0	800	
157	Original	EUC	EUC - Design and build modern desktop platform (core applications only), Desktop Migration and Desktop Application Migration	Design and build a modern desktop platform, compatible with TFL's core applications. This will be placed in the service catalogue and supported by TSO. Migrate	2,650	2,000	-	-	-	4,650	Capex		0	0	0	0	0	0	2650	2000	0	0	0	4650	

	A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	Detailed summary of Enhanced Business Plan											"Valid" remaining authority					Additional Authority Required								
2	New ID	Portfolio/Product family	Programme/Project Name	Description	2018/19	2019/20	2020/21	2021/22	2022/23	Total	Opex / Capex	2018/19	2019/20	2020/21	2021/22	2022/23	Total	2018/19	2019/20	2020/21	2021/22	2022/23	Total		
158	Original	EUC	EUC -Office365 deployment	Deploy Office 2016 to desktops, migrate workloads for email, email archive, skype for business and home drives to Office365's cloud tenancy. Includes support for deployment and migration of a new mobile device management capability in order to realise the benefits from the business case	300	50	-	-	-	350	Capex	0	0	0	0	0	0	300	50	0	0	0	350		
159	Original	EUC	EUC -Mobile management in-housing migration (includes business case development)	EUC -Mobile management in-housing migration (includes business case development)	364	-	-	-	-	364	Capex	0	0	0	0	0	0	364	0	0	0	0	0	364	
160	Original	EUC	EUC -Identity management service Business Case	Provide the business case to launch an identity management service within T&D that can serve the needs for non-T&D Identity Management. Currently we have duplicate communication mediums available to back office staff. This initiative will rationalise and deploy a back office telephony solution. It	-	-	-	-	-	-	Opex	0	0	0	0	0	0	0	0	0	0	0	0	0	
161	Original	EUC	EUC -Back Office Telephony business case	EUC -Back Office Telephony business case	-	150	-	-	-	150	Capex	0	0	0	0	0	0	0	150	0	0	0	0	150	
162	Original	EUC	EUC -Desktop hardware refresh	Purchase and deploy new endpoint devices to users	1,000	3,500	3,500	1,500	1,500	11,000	Capex	0	0	0	0	0	0	1,000	3,500	3,500	1,500	1,500	11,000		
163	Original	EUC	EUC -Pull printing expansion	Expand the use of the managed print service contract to provide printers in additional locations	124	106	-	-	-	230	Capex	0	0	0	0	0	0	124	106	0	0	0	230		
164	Original	EUC	EUC -Azure mobile components remediation	Azure components are regularly updated and depreciated due to the nature using cloud services. This means that there is a continual low level of work to ensure that application aren't negatively impacted.	75	419	348	363	378	1,583	Capex	0	0	0	0	0	0	75	419	348	363	378	1,583		
165	Original	EUC	EUC -London Transport Museum IT in-housing	The London Transport Museum have asked T&D to in-house their IT services after 3 of their 4 IT staff have left. T&D are working with the museum to provide options for in-housing services. This is a request to 1. Establish Pilot which will bring the LTM onto OneLondon 2. Establish a project to define & deliver the best solution to consolidate LTM desktop services into TFL T&D "	-	-	-	-	-	-	Opex	0	0	0	0	0	0	0	0	0	0	0	0	0	
166	Adjust - Small Works	Small Works	Small Works	Pipeline work - Published Business Plan	1,461	1,495	1,530	1,566	1,566	7,618	Opex	0	0	0	0	0	0	1,461	1,495	1,530	1,566	1,566	7,618		
167	Adjust - Small Works	Small Works	Small Works	Pipeline work - phasing	-	1	-	-	-	1	Opex	0	0	0	0	0	0	-1	0	0	0	0	-1		
168	Adjust - Small Works Transfer	Small Works	Small Works	Transfer to Surface; to align Small Works budget spend	-	482	-	506	-	518	Opex	0	0	0	0	0	0	-482	-494	-506	-518	-518	-2518		
169	Adjust - C/Fwd Unallocated	Unallocated	Unallocated	Aggregated Carry Forwards from 2017/18 - for projects a	1,786	200	-	-	-	1,986	Capex	0	0	0	0	0	0	1,786	200	0	0	0	1,986		
170	Adjust - C/Fwd Unallocated	Unallocated	Unallocated	Carry Forward from 2017/18	1,400	-	-	-	-	1,400	Capex	0	0	0	0	0	0	1,400	0	0	0	0	1,400		
171	Adjust - Unallocated	Unallocated	Unallocated	Investment Programme	7,276	563	2,613	9,963	-	26,242	Capex	0	0	0	0	0	0	7,276	563	2,613	9,963	-26,242	-5827		
172	Adjust - Unallocated	Unallocated	Unallocated	Investment Programme	2,734	1,419	725	2,322	2,662	9,862	Opex	0	0	0	0	0	0	2,734	1,419	725	2,322	2,662	9,862		
173																									
174																									
175	Total Draft Budget (version W11)				86,262	64,655	68,944	68,578	34,589	323,027		32,534	10,699	7,266	3,081	3,459	57,039	53,728	53,956	61,678	65,497	31,130	265,989		

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Category	Programmes/Projects		2018/19	2019/20	2020/21	2021/22	2022/23	Total 2018/19 - 2022/23
			£'000	£'000	£'000	£'000	£'000	£'000
	Revised - Total Project budget for T&D - Published Business Plan - (A)		86,267	64,654	68,945	68,578	34,589	323,031
Portfolio	Payments - CUBIC Service Delivery Assurance	Payments - Revenue Collection Asset Investment	13,606	12,151	11,762	7,561	7,939	53,019
Portfolio	Payments	Payments - Enhancements to Oyster and the Revenue Collection System	11,410	7,786	12,930	7,300	0	39,426
Portfolio	ERP	Enterprise Resource Programme (ERP) – mostly retain and enhance SAP	3,175	5,660	5,500	6,500	5,000	25,835
Portfolio	Surface Buses	Surface Buses - Bus Operating and Monitoring Systems	12,664	7,988	25,179	27,551	16,250	89,632
Portfolio	Networks	Networks - Consolidation of Data Transmission	13,166	9,058	1,500	2,500	2,500	28,724
Portfolio	Infrastructure & Hosting	Hosting - Data Centre Rationalisation and Cloud Migration	6,393	649	0	0	0	7,042
Portfolio	EUC	End User Computing (EUC) Products - desktop, laptop, mobile, other	4,663	6,225	3,848	1,863	1,878	18,477
Portfolio	CCO	Contact Centre Operation (CCO)	1,859	617	47	0	0	2,523
Portfolio	CSIRT	Cyber Security	1,695	1,970	180	180	180	4,205
Portfolio	Tech Refresh	Tech Refresh - Investment in our Data Centre Servers	1,949	2,008	3,926	2,130	23,054	33,067
Portfolio	Infrastructure & Operations (TSO)	Technical Service Operation (TSO) - Maintenance of Applications & Operations of Service	8,507	7,430	2,500	2,500	2,500	23,437
Portfolio	Data & Analytics	Data & Analytics	2,280	4,620	1,650	1,300	2,300	12,150
Product Family	Asset Management	Asset Management Products	50	0	0	0	0	50
Product Family	Content & Collaboration	Content & Collaboration Products	1,200	1,000	500	340	0	3,040
Product Family	Access & Networks Management	Access & Networks Management Products	531	0	0	0	0	531
	Small Works	Small Works	978	1,001	1,024	1,048	1,048	5,099
	Capital Investment Programme	Sub-Total	84,126	68,163	70,546	60,773	62,649	346,256
Portfolio	Payments - DCC Investment Fund	Payments - Credit returned to TfL	-11,060	-5,690	-4,940	-4,480	-4,480	-30,650
	Total funding required by T&D (B)		73,066	62,473	65,606	56,293	58,169	315,606

Variance against Total funding (B - A) **-13,201** **-2,182** **-3,339** **-12,285** **23,580** **-7,425**

	Unallocated	Unallocated (Capex and Opex)	13,196	2,182	3,338	12,285	-	23,580	7,421
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PIC submission: Table 6.1 - Summary of the costs and fu

Portfolio		
Rounded to £m		
Cost	Investment Programme Total	(A)
Funding	Financial Authority from Adjusted Business Plan	(B)
	Other funding - Credit from Cubic	(C)
	Actual funding required from T&D	(D) = (A - C)
Variance	Unallocated	(V) = (B - D)
Authority	Existing Project Authority	(E)
	Unallocated	(V)
	This Project Authority request	= (A - E) + (V)
	Future Project Authority request	= (A - E) + (V)

Technology & Data
Existing Financial Authority for FY18/19 and 19/20
£ 167.7m

167.7
= (B) + (C)

inding

Business Plan			
18/19	19/20	20/21	21/22
84.1	68.2	70.5	60.8
86.3	64.7	68.9	68.6
11.1	5.7	4.9	4.5
73.1	62.5	65.6	56.3
13.2	2.2	3.3	12.3
43.6	16.4	12.2	7.6
13.2	2.2	3.3	12.3
53.7	54.0	-	-
-	-	61.7	65.5

a (T&D) Investment Programme FY18/19 and 19/20			
Estimated Final Cost for FY18/19 and 19/20	Existing Programme and Project Authority for FY18/19 and 19/20	Additional Authority Requested for FY18/19 and 19/20	Total Programme and Project Authority for FY18/19 and 19/20
£ 167.7m	£ 60.0m	£ 107.7m	£ 167.7m

167.7
= (A) + (V)

60.0
=(E)

107.7

167.7

	22/23	Total
	62.6	346.3
	34.6	323.0
	4.5	30.7
	58.2	315.6
-	23.6	7.4
	7.9	87.7
-	23.6	7.4
	-	107.7
	31.1	158.3