

Transport for London

Investment Programme Report

Quarter 4 2020/21

Contents

Introduction	5
Major Projects	6
London Underground	6
Surface Transport	6
Other	6
The impact of the coronavirus pandemic	6
Performance at a glance	8
Major Projects	8
Line upgrades	8
Four Lines Modernisation	8
Railway Systems Enhancements (formerly World Class Capacity)	9
DLR Rolling Stock and Systems Integration	9
Piccadilly Line Upgrade – rolling stock (formerly Deep Tube Upgrade Programme) ..	10
Network extensions	12
Northern Line Extension	12
Silvertown Tunnel	13
Barking Riverside Extension	14
Bank Station Upgrade	15
Elephant & Castle	15
High Speed 2	17
Elizabeth line	18
Liverpool Street	18
On-Network Station Improvement Programme	18
Rolling stock	19
Central operating section	19
Reading and Heathrow	19
Stratford to Shenfield	19
Crossrail	20
London Underground	21
Stations	21
Paddington	21
Tottenham Hale	21
Knightsbridge	21

South Kensington	21
Colindale.....	22
Stratford.....	22
West Ham.....	22
Accessibility.....	22
Track renewals.....	23
Rolling stock.....	23
Renewals	25
Power and Cooling	26
LU Technology	26
Networks and connectivity.....	26
Asset management.....	27
Surface Transport.....	28
Healthy Streets.....	28
Old Street roundabout	29
Cycleway 4	29
Cycleway 9	30
Safer Streets.....	30
Responding to the coronavirus pandemic.....	31
Air quality	33
ULEZ expansion	33
LEZ and Direct Vision Standard	34
Vehicle scrappage and support schemes	34
Rapid charging	35
Greener fleet.....	35
Asset investment.....	36
Public transport	38
London Overground.....	38
Elizabeth line fleet.....	39
DLR	39
London Trams	40
Santander Cycles	40
London River Services.....	41
Surface technology	42

Roads technology	42
Operational safety and compliance	42
Public transport technology	43
Other.....	44
Technology and data.....	44
Payments.....	44
Content and collaboration/Evergreen programme	44
Hosting – data centre rationalisation and Cloud migration.....	45
Networks.....	45
Technical service operation	45
Enterprise resource planning	45
Contact Centre operation.....	45
Growth Fund	46
2020/21 Strategic Milestone performance	47

Introduction

This report provides an update on a range of projects that will further enhance our world-class transport services in London. This report covers Q4 2020/21 (10 January 2021–31 March 2021).

For each major project or programme, the financial and milestone data represent the position at the end of the quarter, and we include commentary for key achievements and progress made. The report also contains, as far as possible, updates on notable progress made after the end of the quarter.

Financial records of spend to date, authority and Estimated Final Costs (EFC) represent the entire duration of each separate project or programme, except where stated in the date range. Where authority is significantly lower than EFC, it has been given for the current stage of works and further authority will be sought when appropriate.

We also include cumulative EFC movements for savings and efficiencies that have been embedded since the 2020 Budget, while protecting safety, services and reliability. Numbers in brackets represent an EFC decrease and numbers without brackets represent an EFC increase.

Commentary is provided for cumulative movements greater than £2m. This report does not contain commercially sensitive information and therefore some EFCs and authorities are marked with an asterisk until the main contract has been awarded. On schemes where there is commercial confidentiality, the EFC, authority and spend to date may also be withheld.

All financial figures are gross and may not appear to align with costs detailed in the 2020 budget, which are net of any third-party funding.

The total number of physical injuries over the past financial year stands at 101, demonstrating a 45 per cent decline on the previous year and continuing the year-on-year decline in the number of injuries across the Major Projects Directorate (MPD), Project and Programme Delivery (PPD) and London Underground Renewals and Enhancements (R&E). Despite this welcome news, injuries must be considered in the context of hours worked, which were significantly lower in 2020/21 than in previous years, standing at nine million (30 per cent lower than in 2019/20).

During Q4, there were 36 injuries in total, with the most common cause being slips, trips and falls (12). This represents a slight increase on the previous quarter but is not significant.

There were two Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) accidents in Q4, lower than the seven reported in the previous quarter. The two RIDDORS comprised one in MPD and one in LU R&E.

During Q4, there were seven Lost Time Injuries (LTIs), two in MPD and five in LU R&E (none were reported in PPD). This total figure was significantly lower than in Q3.

The leading cause of RIDDORs & LTIs over the past financial year was slips, trips and falls.

Every injury is subject to a local investigation to establish root cause(s) and put in place mitigations to help prevent re-occurrence. Where identified, lessons from local investigations are shared across capital delivery and, where appropriate, across the wider industry. Sharing is either via Safety, Health and Environment bulletins, our newly instigated capital lessons learnt process or a bespoke communication event.

The strategic milestones for the second half of 2020/21 – the key milestones listed in the 2020 budget – are detailed on page 47.

Our investment programme is delivered by the following areas of the business and the report structure reflects this.

Major Projects

This is responsible for our largest and most complex projects. It comprises line upgrades, such as the Piccadilly line upgrades and the Four Lines Modernisation, network extensions, major station upgrades, the Elizabeth line and Crossrail, which are covered on pages 8 to 20.

London Underground

This comprises stations, accessibility, track renewals, power, cooling and energy, rolling stock, and signalling and control, which are covered in pages 21 to 27.

Surface Transport

This comprises Healthy Streets, air quality, public transport and asset investment. These are covered in pages 28 to 43.

Other

This comprises technology and data and the TfL Growth Fund, which are covered in pages 44 to 46.

The impact of the coronavirus pandemic

Following the temporary Safe Stop last year, each project had a full review of working practices in accordance with Public Health England guidelines. These were reviewed by construction managers before work recommenced.

There continues to be a knock-on effect from the coronavirus pandemic in terms of workplace requirements and the availability of our employees and the supply chain, however the main priority continues to be ensuring safe working practices for all.

Following the introduction of Tier Four measures and the subsequent third national lockdown, we reinforced safety measures further to address growing concerns regarding the transmissibility of COVID-19. The teams continue to plan and prepare for the risk of an outbreak on a site, including introducing limited flow testing using guidance from the Construction Leadership Council and from Public Health England.

Performance at a glance

Major Projects

Line upgrades

Four Lines Modernisation

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2023/24	5,009	5,412	5,394	0	386

*to be updated in July 2021 following completion of ongoing EFC/Schedule reviews

On 7 March, the Four Lines Modernisation programme reached a significant milestone when the new signalling system went live in Signalling Migration Area 3 (SMA3) between Monument, Euston Square and Stepney Green. Reliability and performance of the new commissioned area have been very positive, learning the lessons of the past, and instils confidence in our approach for future SMA commissioning areas. This is the largest and most complex migration area commissioned to date and introduced the full complement of District line drivers to the new signalling system. Following the success of SMA3, we have now commissioned SMA4 between Sloane Square and Monument as planned on 24 April 2021. This paves the way for frequencies to be increased and service reliability to be further improved as soon as the rest of the route has been automated.

Following challenges linked to software development, installation and the impact of the pandemic, an extended programme and cost review are currently under way and will also accommodate the outputs and lessons learnt from delivering SMA3 and 4 into revenue service.

We are planning to complete this review by June 2021, which will result in a revised schedule and cost re-forecast.

We continue to make good progress across the entire programme and have successfully completed a number of key works undertaken during closures, including system testing of future signalling for migration areas 5, 6, 7 and 8.

Additional key works have also been completed during closures, including dynamic testing of the east end of the District line and the remaining migration areas that will in future complete the Circle line. On the Metropolitan line, significant work in the Neasden area has also advanced readiness for testing of the first section, extending future operation beyond Finchley Road.

Recent successes give us confidence in the near-term programme (migration areas 5 to 7). Beyond that, however, further complexity exists. Significant technical and risk analysis has been undertaken to ensure the joint programme team are in the best place to determine the roadmap ahead.

Railway Systems Enhancements (formerly World Class Capacity)

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2023/24	138	245	192	0	54

The EFC is £53m lower than the Programme and Project Authority, due to historical Jubilee and Northern line additional trains being taken out of scope, and scope transfer for high-voltage works at Stockwell station to another project.

We successfully completed the Northern Line Speed Improvement Works (Working Timetable 58 Project) commissioning of the enhanced signalling software. This is one of the final critical activities on the project to enable improved run times, reliability and functional improvements, and prepares the railway for the introduction of the new timetable when the Northern Line Extension opens in autumn 2021.

The Kennington speed uplift team has successfully completed all works on the northbound track and are due to complete works on the southbound track by the end of May 2021. This work improves the track condition and is on target to make all the necessary improvements in advance of the start of the Northern Line Extension revenue service.

The Northern line rolling stock team has completed the decommissioning of redundant legacy signalling assets from all 106 Northern line trains. This was an outstanding safety-related action from the Northern line upgrade project.

DLR Rolling Stock and Systems Integration

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2024/25	89	864	859	(4)	770

The EFC has reduced by £4m as a result of savings made on the contract award of the Beckton depot northern sidings works and mitigation of associated risks.

The aim of the programme is to manufacture and supply 43 new DLR trains, 33 to replace the life-expired fleet and 10 to increase capacity. It will also include an expanded depot to stable and service the new fleet and signalling modifications to the Thales Automatic Train Operation system to support the new trains. In addition, telecoms system modifications will provide enhanced customer-facing information and traction power capacity works.

Rolling stock manufacturing is under way with Construcciones y Auxiliar de Ferrocarriles. The first three new bodysells have been completed, with remote first article inspections successfully finished in lieu of visits to the manufacturer's facilities. The first trains are due for delivery for testing on the DLR network in 2023.

The Beckton depot enabling works package is complete in line with programme. The Beckton depot northern sidings works have started on site to deliver the expanded stabling of the new fleet and are the first major works within the Beckton depot footprint. These works are scheduled for completion in early 2022.

Thales signalling software development for the route signalling modifications required for the introduction of the replacement trains has started. Power upgrade works have also begun on site and are expected to be completed in 2022.

Authority to enter into the grant agreement for the Housing Infrastructure Fund (HIF) works to deliver 14 additional trains and stabling capacity was approved in December 2020 and the grant agreement has now been signed.

Piccadilly Line Upgrade – rolling stock (formerly Deep Tube Upgrade Programme)

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2026/27	273	3,294	2,911	1	2,638

The EFC is £383m lower than the Programme and Project Authority as the project is progressing, with efficiencies being implemented and programme level risk reducing.

We continue to collaborate with Siemens despite the shift to remote working, and together in March 2021 we unveiled the detailed design of the new-generation trains for the Piccadilly line. This is a significant milestone and we continue to work in partnership with Siemens towards our next strategic milestone, namely the start of train manufacture, planned for summer 2021.

At the beginning of March 2021, Siemens erected the first steelwork of the train manufacturing plant in Goole, East Yorkshire, where up to 50 per cent of the new Piccadilly line trains will be assembled. Site construction will be complete in 2022, in readiness for the manufacture and roll-out of the first train in 2023.

We also started on site with our depot upgrade works at South Harrow sidings. We will be introducing four additional stabling roads at this site.

These works are a key enabler for the upgrades of our main depot sites at Northfields and Cockfosters, as this additional stabling capacity will allow us to decommission existing roads within these depots without impacting fleet availability.

Further information can be found in the full [press release](#).

Network extensions

Northern Line Extension

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2021/22	*	1,260	*	*	*

* Data has been redacted due to commercial sensitivity

At Battersea station, we completed a 24-hour test run on escalators that will take our customers from the ticket hall to platform level. The glass balustrades on escalator banks 1 and 2 are complete. The central roof and western side of the Eastern Head House are also finished, enabling handover of another section of site to Battersea Power Station Development Company (BPSDC).

Gatelines at both Battersea and Nine Elms stations are nearing completion, and the first ticket-vending machines have been installed at Battersea station.

Over the Easter weekend, we carried out signal testing with passenger trains. We tested track-to-train CCTV and the tunnel ventilation fans with both static and moving trains to check air flow.

We have opened the four new cross passages at Kennington station, which will make transferring between different branches of the Northern line at Kennington much quicker and easier for our customers.

Our focus is now on the work packages and resources required to support the start of trial operations planned for July 2021, and revenue service planned for September 2021.

Silvertown Tunnel

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2024/25	56	180	197	(5)	140

Financial data includes direct capital costs to TfL, other than the early development costs incurred by TfL that have been reimbursed by the Private Finance Initiative contractor. It excludes construction costs being incurred by the concessionaire, as these will be funded through the availability payments once the tunnel is open.

The EFC reduction of £5m is due to a revised resource forecast, savings from early site handover and reductions in risk. Riverlinx is reviewing its design programme and will update on whether there are further opportunities in relation to the land access schedule.

The EFC is £17m greater than the Programme and Project Authority due to an increase in costs for implementation of road user charging infrastructure. The project is considering the transfer of scope and budget for this package of work to Project and Programme Delivery (PPD) in Q1 2021/22 to achieve synergies with TfL's other Road User Charging schemes. Sponsorship will remain with the MPD to ensure project objectives are met.

Please note: All numbers shown as net of income and third-party contributions

The site physical works have started to accelerate. We have completed the ground investigation and surveys to facilitate utilities mapping enabling, and have had positive engagement with the utility companies. Works have started on cabling and diversions to enable the power supply for the tunnel boring machine (TBM). Site works have begun in both Greenwich and Silvertown, including where the TBM launch chamber will be constructed.

Following demolition of existing buildings and site clearance, there are now several piling rigs working across the site.

The contract for the design and manufacture of the TBM continues to progress. Fire resistance tests on the tunnel lining segments are ongoing with the suppliers through to June 2021.

Contracts have also been placed for transport and traffic, socio-economic and environmental monitoring, which are part of our Development Consent Order obligations. Environmental monitoring has started, with the others planned to start later this year. This

data will enable us to carry out modelling to adequately plan and implement our strategies prior to tunnel opening. The tunnel permit-to-use date remains unchanged at 2025.

Barking Riverside Extension

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2022/23	252	329	331	3	79

The EFC increase of £3m is due to the associated costs of restaging for buried utility services, now resolved, and prolongation costs associated with COVID-19. This was formalised with the Joint Venture in Q4 by way of a Supplementary Agreement, providing much greater confidence in the main works schedule and associated cost.

The updated Programme and Project Authority of £328m was approved in December 2020 and we plan to update the Programmes and Investment Committee in July once there is greater certainty on securing Network Rail possessions and third-party recoveries.

On the viaduct, all piling, pile caps and pier walls have been completed and the remaining one deck span was successfully lifted into position over Easter 2021. This completes the construction of viaduct structures that support 4.5km of track slab and is a major milestone.

Following completion of concrete works on the south viaduct in December 2020, installation of finishes, drainage and handrails has continued. North viaduct works are ongoing to finish the ramp and remaining deck slabs, with final pours planned in May. The track slab is being delivered to site prior to its installation on the viaduct, which is now planned to start in June 2021.

At the new station, we have completed the main roof and platform canopy cladding and glazing, and progressed the installation of mechanical and electrical equipment, including the power supply and lifts.

In January 2021, we completed the major signalling stage that was cancelled at Easter 2020 due to the first wave of the coronavirus pandemic. Signalling stages 10 and 11 have since been completed successfully, together with preparations for stages 13 and 14, which are due to be commissioned in June and July 2021. Stage 12 was removed during re-planning of the rail systems delivery, which was required due to the pandemic.

We are currently working towards autumn 2022 for revenue service to begin, but this is dependent upon securing the required Network Rail possessions.

Bank Station Upgrade

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2021/22	570	701	700	(1)	130

The installation of new track has started this quarter. A small delivery tunnel between the existing and new southbound running tunnels was excavated to allow delivery of rail sections into the worksite to facilitate the installation of 100 metres of new track. Fit-out of new and existing parts of the station continues. Cabling works have started in all areas, while installation of primary cable management and ventilation systems are approaching completion.

Manufacture of 12 new escalators and two new moving walkways is complete. Preparatory works and installation have now started on site.

Planning for the temporary closure of the Northern line Bank branch and associated Northern line stations continues. This will allow the existing southbound Northern line to be connected into the new running tunnel and platform at Bank, allowing the old running tunnel to be transformed into a new larger passenger concourse.

Elephant & Castle

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2029/30	5	*	*	*	*

* Data has been redacted due to commercial sensitivity

Negotiations with the developer continue and TfL remains supportive of the proposal. Subject to a development agreement being confirmed in the coming months, the developer will build the new station box, to be funded by TfL.

We continue to develop plans for early enabling works in order to take advantage of the temporary closure of the Northern line Bank branch. Tunnelling works to connect with the existing Northern Line platforms are due to commence once the station box has been handed over by the developer in 2024. In parallel, the team continue to identify cost reduction opportunities, in addition to logistical planning. This is reliant on funding confirmation.

The developer continues with the demolition of the existing Elephant & Castle shopping centre and has now reached the point of connection with the adjacent National Rail station.

High Speed 2

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2027/28	16	22	62	(16)	47

Programme and Project Authority is £40m lower than EFC as it is granted on an annual basis for the following year's spend. The EFC reduction is predominantly due to a descope of the Euston substation works and removal of bus mitigation works due to reduced demand during the coronavirus pandemic.

This project is fully refundable by HS2 Limited and the scope of works is dependent on third-party requirements. Enabling works are ramping up at Old Oak Common in readiness for piling and excavation works for the main station box, which are expected to start in May 2021. This is pending resolution of ground monitoring requirement issues, which have progressed substantially during this period.

We continue to work with several stakeholders around the affordability study of High Speed 2 in the Euston area. These stakeholders include HS2 Limited, Network Rail, the London Borough of Camden and Lendlease under the umbrella of the newly formed Euston Partnership. A decision on the high-level proposal is imminent.

We collaborate with HS2 Limited and its supply chain in reviewing and assuring their designs and works where there is a potential impact on our assets or operations.

Elizabeth line

Liverpool Street

The Liverpool Street (mainline station) 'blockade' works were successfully completed over Easter. These works will provide platform extensions to accommodate full-length trains operating into the mainline station from Shenfield.

On-Network Station Improvement Programme

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2021/22	93	94	95	0	2

The On-Network Station Improvement Programme continues to deliver upgrades at the surface stations on what will form the future Elizabeth line route.

On both the eastern and western sections of the route, step-free project work continues to progress and secure the appropriate level of handover paperwork from the contractors involved. On the Great Eastern, final submissions have been made and are with TfL for review. On the Great Western, there are challenges around the handover programme due to a lack of resources for the review of documentation.

The station refurbishment programme, delivered in partnership with our operator Mass Transit Railway (MTR) Elizabeth Line, has continued. Platform canopy works have been completed at Manor Park, and new canopies are planned for Ealing Broadway and Hayes & Harlington in the coming months to complement the works being undertaken by Network Rail. Projects are also under way at Burnham and Taplow to improve the station buildings and refurbish customer facilities.

TfL/MTR's recent work at Hanwell has been recognised by Historic England and the London Borough of Ealing, with the station being removed from Historic England's 'Heritage at Risk' register.

Rolling stock

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2024/25	986	1,149	1,006	0	20

We are introducing the new Elizabeth line train fleet and have built a depot to provide train maintenance facilities.

Central operating section

System integrated dynamic testing (running a maximum of eight trains testing system performance in the Trial Running entry configuration and allowing traffic managers and infrastructure managers to gain early experience) concluded on 16 March. The Class 345 sub-fleet allocated to the central operating section is ready to support the entry into Trial Running.

Reading and Heathrow

The nine-car Full Length Units with new software introduced in December 2020 to the Reading route have driven the expected improvements in fleet reliability during the quarter. The next software update is now being introduced to service on the Reading and Heathrow routes and is showing a further increase in reliability.

Stratford to Shenfield

Seven-car Class 345 trains continue to operate on this service. For Stage 4a (from May 2021), seven-car services on this route will be augmented with nine-car Class 345 trains (replacing a number of TfL Rail Class 315 trains). Full transition of the Stratford to Shenfield service to nine-car services will take place from September 2021.

Crossrail

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2022/23	*	18.4	*	*	*

* Data has been redacted due to commercial sensitivity

On 27 March 2021, the project transitioned from a construction environment to an operational environment, operating under the Railways and Other Guided Transport Systems (Safety) Regulations 2006 rulebook. As part of this move, TfL's service and infrastructure managers are now accountable for the safety, operation and maintenance of the 'live railway'.

On 28 March, the Great Western Main Line transition was commissioned. The central section infrastructure is now connected to the Great Western route to trial run trains across that route.

Work is continuing at our stations to complete the remaining works necessary for the railway to enter passenger service. Custom House and Farringdon have already been handed over to TfL and London Underground. Tottenham Court Road and Paddington are both in the process before handover, focused primarily on extensive testing and commissioning of systems. It is still anticipated that the railway will open for passenger service in the first half of 2022.

Acton Main Line and West Ealing were handed over by Network Rail to the operator of the Elizabeth line (MTR Elizabeth Line) on 16 March and 25 March, respectively. These stations now provide crucial step-free access to passengers. The focus now shifts to Ealing Broadway, with the delivery of step-free access expected in the spring. West Drayton, Hayes & Harlington and Southall stations remain forecast to be step-free by the summer of 2021.

London Underground

Stations

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2022/23	100	345	884	0	784

The stations programme includes a wide range of projects, including large station capacity upgrades. The structure of the programme has recently undergone a review with the aim of simplifying the portfolio of projects – an update will be presented at the next Programmes and Investment Committee.

Paddington

At Paddington we continue to work with Great Western Developments on a co-funded scheme that will deliver substantial benefits to customers accessing the Bakerloo line. The development scheme provides an enlarged ticket hall and step-free access to the Bakerloo line platforms. Demolition of the old half of the ticket hall is now complete. This will enable piling works to take place to create the new lift shaft. Work on the new station structures to extend the Bakerloo line ticket hall is well under way and is due for completion in early summer 2022.

Tottenham Hale

Critical roofing works have been completed and external glazing and cladding works are in progress. The internal fit has now begun.

Knightsbridge

Work to fit out the new Hooper's Court and Brompton Road entrance has begun and manufacture of the three lifts to make the station step free has been instructed.

South Kensington

The enabling works to implement and safeguard planning permission for works on the station were completed in Q3. Meanwhile, works started in Q4 on replacement of the life-expired escalators. This will involve the non-stopping of Piccadilly line trains until 2022, however the Circle and District line platforms remain open.

Colindale

A detailed design contract was awarded in September 2020 and is due to be completed during Q1 2021/22. The design is progressing well.

Stratford

A new south-western station entrance is forecast to open during 2023 and will provide new ticket gates and an improved public area. The project received approval to undertake and complete concept design. It is a collaborative venture with London Legacy Development Corporation and the London Borough of Newham who are funding the capital works. Procurement of concept design is under way and due to commence in Q1 2021/22.

West Ham

Enabling works adjacent to the Jubilee line track are ongoing, preparing the area for piling which is due to begin later in 2021.

Accessibility

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2023/24	92	176	175	0	83

We are making 12 stations accessible as part of the London Underground accessibility programme. We have delivered step-free access at seven stations since 2018, with the remaining five to be delivered by the end of 2021. Debden is the most recently delivered station, achieved on 1 April. Main works and lift installations continue at Osterley, Ickenham, Wimbledon Park, Harrow-on-the-Hill and Sudbury Hill, and are due for completion by the end of 2021.

Track renewals

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
Annual	76	81	81	0	5

At the start of the last quarter of 2020/21, the track programme had the challenging task of delivering 1.5km of new ballasted mainline track, which amounts to more than a third of new track delivered in 2020/21. The ballasted track renewal works were spread across six weekend closures on the District, Central, Hammersmith & City and Bakerloo lines. Our Integrated Track team successfully completed the works during planned line closures in February and March. The Epping train arrestors work remains outstanding due to cold weather on the planned weekend in February.

Our Track Delivery Unit team installed 0.9km of new deep tube track, and 0.2km of new ballasted track at Ruislip depot. In total, 2.6km of new track was installed in Q4 2020/21.

Rolling stock

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2026/27	232	703	1,049	0	818

We have commenced the Rail Vehicle Accessibility Requirement project on the Bakerloo line fleet and are currently working through the design and early parts manufacturing processes. A Bakerloo line train is currently at Acton maintenance shed having the first wheelchair bays installed. A second train, with new LED lighting throughout, is scheduled to enter service in May 2021. The Central Line Improvement Programme is progressing, with detailed design validation through the installation and testing of all prototype systems.

The first Metropolitan line S8 stock train has been lifted into heavy overhaul and the first bogies built. The Victoria line fleet overhaul is continuing to plan and is now 75 per cent complete. The Piccadilly line fleet overhaul of seating and flooring work has continued as planned and the pneumatic control module overhaul has re-started with Alstom.

The host wagons used for the Mechanised Renewal Vehicle (MRV) prototype have been refurbished, fitment of track renewal equipment to the wagons has begun and preparations are being made for initial testing of the system. The MRV is designed to mechanise track renewals in the deep tube to improve installation efficiency and reduce manual handling. Trials are planned to start in the spring.

Four pre-production wagons arrived in the UK from China, but dynamic testing is behind schedule due to build quality issues that need rectifying prior to testing.

Remote Track Monitoring (RTM) is undergoing an internal project assurance exercise prior to procuring the train measurement asset through competitive tender. The RTM will replace the life-expired track recording vehicle, which is being modified to operate on the new signalised sub-surface railway.

We are engaging with the market to replace our engineering locomotive fleet, which hauls engineering vehicles around the network. Feasibility for replacement locomotives is progressing well.

Renewals

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2024/25	134	285	341	0	207

The purpose of the LU Renewals Programme is to ensure LU assets remain safe and operable in perpetuity, through the delivery of prioritised workbanks to improve asset condition. The workbanks are created through the outcome of annual asset condition reviews. Assets that pose a risk to safety and reliability are prioritised; these are identified through multi-discipline assessment and are ranked based on safety, compliance, reliability and obsolescence threat. The LU Renewals Programme brings together a number of programmes: Buildings and Stations, Civils, Power, Electricals and Cooling. Power, Electricals and Cooling initiatives under the LU renewals programme are essential works and are aimed at ensuring compliance, safety and reliability.

Work continues to replace communications equipment across key stations, including King's Cross St Pancras and the Jubilee line extension stations.

We have installed and commissioned One-Person Operation CCTV cameras on platforms across Leytonstone, Stratford, West Ham and Holborn stations on the Central line. We have also prioritised works at Waterloo to address safety concerns and to provide safer access to and from the trains.

Platform to Train Interface improvement works on the Jubilee line have successfully met physical completion and the project is now being closed out.

Passenger to Train Interface improvement works on the Bakerloo line have commenced on site at Oxford Circus.

Embankment strengthening works between Grange Hill and Chigwell have commenced on site as scheduled.

The Uninterruptable Power Supply equipment at Wood Lane Control Centre was successfully replaced, removing a critical risk to the railway.

The Central line signalling and control system life extension project has completed conceptual design and is progressing towards contract award.

The Incremental Signalling Upgrade Programme has been initiated. In the first five-year tranche, critical obsolescence issues will be addressed by replacing both the Bakerloo line control system and key components of the Jubilee and Northern line signalling systems, with the first upgrades being planned for the Central line signalling system.

Power and Cooling

As part of the Mayor's Transport Strategy zero carbon target, we have completed converting traditional fluorescent lights to low energy LED lighting at 17 stations, improving efficiency and reducing ongoing maintenance costs. Two stations remain to be converted out of the initial 19 planned – this is due to the temporary Safe Stop implemented as a result of the pandemic, and subsequent budget restrictions. The conversion work has now been included in the delivery programme for the next financial year 2021/22.

We are completing the equipment manufacture and software development for the system-wide power control system replacement project to improve safety and reliability. This important step will enable us to proceed with the factory acceptance testing and installation. Unfortunately, the coronavirus pandemic has impacted these works, leading to delay of factory acceptance testing. We are forecasting achievement of this activity by June in line with the Government's current coronavirus restrictions.

As part of the Four Lines Modernisation line upgrade works across the London Underground network, existing substations are being upgraded to accommodate the associated increase in power loads. The upgrades result in increased heat emissions within several substations which, if left untreated, could have a detrimental effect on the operation of equipment and, in extreme cases, on train service.

The Tranche 3A sub vents construction works continue to progress following Safe Stops due to the pandemic. Shepherd's Bush and Earl's Court are undergoing final commissioning following a Safe Start and will be completed in May. Victoria and Notting Hill Gate are awaiting Safe Starts, which are due for completion in Q2 2021/22. The Tranche 3B works are now in delivery following a comprehensive tender process. Acton is in the advanced design stage, with works on site planned for June. Works are targeted to commence on site at Embankment in Q2 2021/22 ,followed by Bouverie Place in Q3.

LU Technology

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2024/25	74	95	205	0	131

Networks and connectivity

We are upgrading key components of London Underground's operationally critical Connect radio system, which provides communication links between trains, stations and control rooms. We have achieved a significant milestone by successfully completing a two-year

programme of work to deliver wide-ranging upgrades to key radio hardware and software and are now working on a second phase to roll out new radio hardware base-stations across the LU network. This second phase will continue through financial year 2021/22 and is expected to be complete in mid-2023. As a result of this work, the Connect system will be able to function into the 2030s.

We have completed installation of public and operational Wi-Fi facilities at Canary Wharf station on the Elizabeth line. We have also begun the roll-out of new staff devices to customer service staff across London Underground, which will enable us to continue to provide the expected level of customer service as passenger numbers increase on our network in 2021.

Asset management

To improve our approach to asset management and long-term investment planning, we are consolidating our Asset Management Information Systems (AMIS) into a single platform for London Underground and Trams. In Q4 we successfully completed the development of our new platform and are now in the process of migrating LU assets onto this new single platform. This work will continue through financial year 2021/22 and is anticipated to complete in late 2022. The London Underground AMIS project is part of a pan-TfL initiative to streamline our approach to asset management, with Surface Transport and other modes all migrating to the same single asset management platform over the coming years.

Surface Transport

Healthy Streets

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year expenditure forecast (£m)	Expenditure movement post plan (£m)
2020/21 - 2024/25	154	230	1,085	(16)

The Healthy Streets Programme and Project Authority was last updated at the November 2020 Programmes and Investment Committee. This includes all spend to 31 March 2021 and contractually committed expenditure beyond this point.

The Healthy Streets Programme is forecasting an increase in expenditure of £16m against the GLA budget. This is mainly driven by the £20m Active Travel Fund (ATF) received from the Department for Transport (DfT) to deliver projects that support the Government's response to the pandemic. The increased expenditure on the ATF has been partially offset by fewer scheme claims being submitted by boroughs in the financial year, as a result of the coronavirus lockdown.

In the quarter, £9.5m Programme and Project Authority has been granted to deliver the Hammersmith Temporary Ferry project.

A PIC chairs action was approved in April to ensure that Healthy Streets can continue with projects in construction, and can maintain support of the boroughs through Local Implementation Plan funding through our short-term funding period.

In the first half of 2020/21, a significant amount was delivered under the Streetspace for London programme in response to the coronavirus pandemic. This included more than 60km of new or upgraded cycle infrastructure, more than 22,000 square metres of extra pedestrian space across 35 locations on the TfL Road Network (TLRN) with a further 180 schemes at town centres and transport hubs on borough roads, 320 School Streets, 88 Low Traffic Neighbourhoods (LTNs) delivered and 86km of bus lanes on the TfL Road Network, with operational hours extended to 24/7 operation across London.

In the second half of the year, we have continued to deliver Healthy Streets and active travel programmes.

Q4 highlights include:

- TfL and the boroughs are committed to improving active travel options as part of our continued response to the coronavirus pandemic, therefore a further 30km of upgraded and trial cycle routes are now open, with another 14km in construction. The boroughs have delivered a further 15 School Streets, with 50 more committed, and another 18 LTNs, with 40+ more in design. This is a continuation of temporary scheme delivery built around new guidance on monitoring, consultation and the use of experimental schemes
- The continued delivery of safety measures on the TLRN, including Safer Junctions and Lower Speed Limit projects
- The remobilisation of borough delivery across a range of Healthy Streets projects
- Detailed work continues for Waterloo City Hub, along with progressing work on major schemes at Vauxhall, Lambeth Bridge and for a new Cycleway along Lea Bridge Road
- Cycleway 10 (formerly known as Quietway 1), which runs between Waterloo and Greenwich on mainly quieter streets, is being upgraded with new wayfinding signage as part of a programme to bring consistency to the design and installation of on-street signage. The purpose is to unlock the cycling network by making navigation simple and clear

Old Street roundabout

Construction work continues to progress on both the highway and station roof strengthening elements. The final traffic switch was successfully completed over the weekend of 16-17 January 2021, which permanently closed the north west arm of the roundabout. The demolition works for the new main station entrance and the new goods lift in the peninsula area were completed on 2 March 2021. The new main station entrance substructure works are currently in progress ahead of the superstructure works commencing from early July 2021. Upgrade and refurbishment of the existing stairs at the north-west entrance to the station is also currently in progress ahead of the adjacent subway 4 ramp closure and passenger lift works commencing from early July 2021.

The other new station entrance at Cowper Street is also progressing and on track to be opened in August 2021. Installation of the precast concrete elements, including the side walls, stairs and landings, was successfully carried out during long weekend traffic closures on 20-21 February and 13-14 March 2021, with the final roof sections to be installed in early May.

Installation of the critical fire safety systems works in the below-surface shopping arcade, in both public and retail areas, began on 13 April 2021. The scheme will substantially improve safety for people walking and cycling at this major junction. Completion is scheduled for autumn 2022.

Cycleway 4

Works along Creek Road within the Royal Borough of Greenwich restarted on 7 December 2020 and are progressing well, with completion due in June. To the east, trial cycling

infrastructure is being progressed to help more people walk and cycle during the coronavirus pandemic. The start of construction on Evelyn Street in Lewisham has been temporarily paused until Government funding beyond 18 May is confirmed.

Cycleway 9

In West London, 2.4km of new temporary cycle track on Chiswick High Road opened in December as part of the Cycleway 9 route between Olympia and Brentford. Works to complete the Kew Bridge and Wellesley Road sections of Cycleway 9 restarted on 4 January 2021. Other sections of the route are progressing well and a safer cycling corridor between Olympia and Gunnersbury has been created.

Safer Streets

We are working on more than 100 vital projects delivering measures to address historical collisions and reduce road danger on the TLRN. Measures include new and upgraded crossing points, improved pedestrian and cycle facilities, speed limit reductions and innovative pedestrian crossing technology.

In 2020/21, we achieved the Vision Zero action plan target of completing 41 Safer Junctions schemes. This success was achieved in spite of the Safe Stop in March 2020 due to the coronavirus pandemic, and included the following:

- Completed construction of a number of Safer Junctions schemes, including Camberwell Green, Edgware Road/Harrow Road, Edgware Road/George Street, East India Dock Road/Canton Street, Britannia Junction, Dalston Junction and Clapham Road/Union Street
- Delivered cycle safety improvements on the A23 Brixton Hill between New Road and Jebb Avenue, and pedestrian improvements on the A10 Stoke Newington Road between Shacklewell Road and Amhurst Road
- Installed measures to improve the safety of pedestrians on the A12 slip roads and at the A2 Amersham Road/Parkfield Road following pedestrian fatalities
- Completed improvements on the A302 Grosvenor Place to eliminate the risk of right-turn collisions
- Introduced 20mph speed limit on 15km of the TLRN, including the A102 Homerton High Street, A4202 Park Lane, A400 Hampstead Road, A501 Euston Road, A21 Lewisham High Street – Molesworth Street, Peckham town centre, A3205 York Road – Battersea Park Road and A3212 Grosvenor Road
- Delivered 29 new and upgraded crossing points, addressed 22 conflict points, widened footways at six junctions, and installed new dedicated cycle signals at three junctions

In Q4, we have:

- Commenced construction of safety improvements at Camden Road/Camden Street – completion of the scheme is expected in June 2021. We continue to work with the

London Borough of Camden to provide mitigation measures on their network as a result of the prohibited left-turn from Camden Street into Camden Road

- Started footway works on Holloway Road. The Safer Junctions upgrade works and carriageway resurfacing are taking place in the new financial year
- Introduced a new 20mph speed limit on Homerton High Street between Ponsford Street and Kenworthy Road, in Peckham town centre and on the A3205 and A3212 corridors as part of the CS8 upgrade
- Safety measures have been introduced on the A20 Amersham Road/Parkfield Road following a pedestrian fatality, and on the A10 Stoke Newington Road between Shacklewell Road and Amhurst Road.

Design work has started to install a new signal-controlled crossing point over Battersea Bridge at the junction with Grosvenor Road, after the tragic fatality of a male jogger. Phase one of the project, delivering a new crossing over the bridge and introducing a 20mph speed limit, is expected to be delivered by the autumn. We plan to consult on the second phase of the scheme, to introduce a new crossing point on the western arm of the junction, in early summer.

Responding to the coronavirus pandemic

We are continuing to work with the London boroughs to rapidly deliver a series of trial interventions implemented in response to the coronavirus pandemic. All activity is being kept under review as appropriate. In addition to the TfL-led programme, £20m has been allocated to borough schemes from the DfT Active Travel Fund Tranche 2 (this is separate from any funding agreement from the DfT with regard to other TfL activity). We met our milestone target for the second half of the financial year, delivering more than 30km of new or improved temporary cycle facilities.

Q4 highlights include works starting on delivery of further sections of the extension to Cycle Superhighway 4 between Aldeburgh Street and Anchor and Hope Lane in January. Upgrades to substantial sections of Cycle Superhighway 8 between Wandsworth and Battersea were delivered during February and March, providing protected cycle lanes along this popular route. In addition, upgrades to Cycle Superhighway 7 were delivered between Oval and Elephant & Castle and works started on the A23 Oval to Streatham cycle scheme. Borough-led delivery continues to make good progress. Greenwich launched consultation on two further routes (Greenwich to Shooters Hill, and Eltham to Greenwich Park). Barking and Dagenham have started construction of their cycle route between Barking town centre and Barking Riverside, as have Camden on an extension to the popular York Way cycle route, which will extend the route to Agar Road. Hackney completed their 2km cycle route along Green Lanes between Woodberry Grove and Petherton Road.

On the borough side, all funds are now allocated, and new guidance has been issued reflecting the change in circumstances across London since May 2020 when the original interim guidance was issued. New guidance on consultation (December 2020), on delivery using temporary and experimental schemes, and on monitoring scheme impacts (both March 2021) has also been issued. Tranche 2 funding is delivering new temporary

schemes, but also enabling changes and improvements to existing schemes, reflecting feedback received. Perhaps the most obvious example of the changes made is the wider use of camera-enforced modal filters by boroughs, reflecting emergency services feedback. Interim monitoring reports on some LTNs are indicating reductions in traffic both within LTNs and on some boundary roads, as well as a growth in walking and cycling. An interim report by the London Borough of Islington indicates no increase in emergency services response times, which builds on a previous long-term study in Waltham Forest (both using London Fire Brigade data), as well as no increase in anti-social behaviour (an academic study of a similar scheme in Waltham Forest showed a 10 per cent reduction in recorded street crime). The GLA has also published a study showing positive impacts on air quality outside schools that have received School Streets interventions.

The Active Travel Fund programme is funded for 2021/22, and delivery is continuing at a pace that reflects the balance of the public health imperative, and an increased emphasis on consultation and engagement.

TfL is appealing the judgment in the judicial review challenge brought on behalf of two industry groups from the taxi trade in relation to the making of a temporary traffic scheme in Bishopsgate (A10) and the issuing of our interim guidance to boroughs. The Court of Appeal has given permission for the appeal to proceed, and it will be heard on 15 and 16 June 2021.

Air quality

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year expenditure forecast (£m)	Expenditure movement post plan (£m)
2020/21 - 2024/25	153	255	640	(46)

The Air Quality Programme and Project Authority was increased at the December 2020 Programmes & Investment Committee. This includes all spend from 2020/21 to 2022/23.

The Air Quality Programme is forecasting an increase in expenditure of £46m against the Business Plan, mainly due to the acceleration of bus electrification. Subject to Government funding, our ambition is to have a zero-emission bus fleet by 2030, which will be delivered by enabling appropriate power supply at bus garages for overnight charging ('grid to gate' – £17m) in the current forecast view.

Additional funding of £4.6m has been provided by the GLA for the London Vehicle Scrappage Schemes, supporting small businesses and lower income individuals in efforts to scrap and/or replace existing vehicles to comply with the Ultra Low Emission Zone (ULEZ) standards.

ULEZ expansion

Since the central London ULEZ was introduced, we have already seen significant air quality improvements, including a reduction of roadside concentrations of NO₂ by more than 40 per cent. By toughening the Low Emission Zone (LEZ) standards and expanding the central ULEZ, it is predicted that more than 100,000 fewer Londoners will be living with levels of air pollution above the legal limits in 2021 than would otherwise be the case. Improvements will continue in future years, both inside and outside the zone.

After the ULEZ is expanded to the North and South Circular Roads and tougher LEZ standards are introduced London-wide, 96 per cent of roads in outer London will comply with legal NO₂ limits by the end of 2021.

Progress on ULEZ expansion schemes is on track. The installation of enforcement cameras has progressed, with around 550 cameras installed to the end of April. Installation of infrastructure for the boundary signs is nearing completion, with 12 out of 14 boroughs completed. Planning for the next phase of signage installation is well under way, with the start of sign and post installation planned to begin in June.

Build of the new Siemens camera data processing systems is complete and now progressing through testing cycles. Migration of the back office processing systems to the Cloud is under way, with two of the four tranches already migrated to the new Cloud Platform.

The ULEZ expansion is scheduled to launch on 25 October 2021.

LEZ and Direct Vision Standard

The LEZ, which covers most of Greater London, encourages the most polluting heavy diesel vehicles driving in the Capital to become cleaner by setting minimum standards for emissions. These standards were tightened on 1 March 2021 for buses, coaches and lorries, in line with the requirements for the central London ULEZ.

Our Direct Vision Standard (DVS) categorises HGVs depending on the level of the driver's direct vision from their cab. The DVS requires all HGVs more than 12 tonnes to hold a safety permit to enter or operate in Greater London from 1 March.

Final system testing and pre-Go live preparations completed on 16 February 2021. Following a weekend of system cutover, testing and assurance, the LEZ and DVS schemes were launched to the public on 1 March 2021.

Pre-launch, the LEZ compliance was at 90.6 per cent, with the preliminary compliance rate shortly after Go live at 93.2 per cent. As of 25 March 2021, we have issued a total of 112,732 DVS permits.

Vehicle scrappage and support schemes

We have been operating the scrappage schemes, which help drivers scrap their older, more polluting vehicles to meet required emissions standards. To date, the schemes have supported the scrapping of in excess of 8,900 vehicles, with more than £41m of grant payments issued.

We have recently agreed the transfer of an additional £4.2m from the GLA, to increase the overall scrappage budget from £48m to £52m. This funding is proposed to be allocated across two scrappage schemes: £1.7m for the Van and Charity Minibus Scrappage Scheme; and £2.5m for the ULEZ Car and Motorcycle Scrappage Scheme (UCMSS).

The Van and Charity Minibus Scrappage Scheme supports small businesses (those with up to 50 employees) and charities to replace older, more polluting vehicles that do not meet the LEZ and ULEZ emissions standards. It has provided grants of between £7,000-£9,500 per vehicle. This scrappage scheme has been extremely popular and due to high demand and limited funds the scheme was suspended to vans in August 2020. More than 1,700 payments were made and around 1,400 applications were held in a queue. The extra funding will allow us to make offers to nearly a third of eligible van applicants in the queue.

UCMSS is a grant available to any London resident who receives certain means-tested or non-means-tested disability benefits. They can apply for a £1,000-£2,000 grant to scrap cars and motorcycles that do not meet the ULEZ emissions standards. The extra funding of £2.56m will allow the scheme to continue to offer support to these target groups who would be disproportionately affected by the ULEZ expansion.

Rapid charging

To support the growing number of zero-emission capable taxis and wider take-up of electric vehicles, we have invested £18m to build a network of electric vehicle rapid charging points (RCPs). Despite delays caused by the pandemic, we achieved our original target of installing 300 RCPs by 31 December 2020, and now have a total of 311 units in operation. Work continues on the delivery of two hub sites at Baynard House in the City of London and Glass Yard in Greenwich, which will add a further six and eight points, respectively.

Greener fleet

The core bus fleet meets or exceeds the Euro VI emission standard. We continue to add zero-emission buses into service, with now more than 480 electric buses in the fleet. The number of zero-emission buses is expected to grow to 700 by the end of the year, including the introduction of 20 hydrogen double-deck buses. All buses operating in our Dial-a-Ride fleet now comply with the Euro VI emission standard, which ensures they meet the requirements associated with our planned expansion of the ULEZ.

Asset investment

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year expenditure forecast (£m)	Expenditure movement post plan (£m)
2020/21 - 2024/25	97	494	994	10

Asset Investment Programme and Project Authority was increased at the March 2021 Programmes and Investment Committee. This includes all spend from 2020/21 to 2022/23.

In 2020/21, £16m of activity was accelerated from 2021/22 given the urgent need to improve asset condition. This included the acceleration of Thames navigational lights in the Structures Programme and the undertaking of eight additional carriageway schemes. The reduction compared to the Business Plan is due to £3m savings realised in the year, including risk releases on the delivery/completion of the Ardleigh Green and Vauxhall Bridge projects and Surface Asset Management Information Systems. There is also a forecast £7m reduction in third-party funded signal modernisation in 2021/22 to reflect a more realistic delivery programme.

The five-year forecast reflects the Long-Term Capital Plan. This option will enable TfL to address high-risk assets (in particular bridges and tunnels) as well as the large backlog of works over the next five years. This will also see gradual improvements in the state of good repair, including carriageways, footways and bridges.

Work is under way on ensuring the safety and operability of our highest priority assets that are in need of urgent renewals, including critical tunnels (Rotherhithe and Blackwall) and structures (A40 Westway, Brent Cross, Croydon Flyover and Gallow's Corner).

By 31 March 2021, the Asset Capital Programme delivered the modernisation of 81 traffic signal sites, 195 new lighting columns, six new bus driver facilities, 405 new bus shelters, renewal of 40 safety cameras and 240,000 square metres of carriageway resurfacing. Five structures were also built: A406 Colney Hatch Lane Underpass, A2 Danson Road Bridge Flyover, A406 Ilford Viaduct over Rail, A406 Barking Viaduct over Rail and A406 Barking and Ilford Viaducts over Rail.

Notable progress in Q4 included:

- Completion of the refurbishment works, including bearing replacement, at the Colney Hatch Lane structure, over the A406 North Circular Road

- Completion of the renewal of the navigational lighting at six TfL bridges to ensure the safety of vessels passing underneath the structures, as well as ensuring the safety of the bridges themselves
- Works commenced at Walthamstow bus station, due to complete in 2021/22
- Design work is progressing to plan on the bridge expansion joint scheme on the A40 Westway, with the works forecast to begin in late summer 2021. The detailed design for protective security measures at Westminster Bridge is progressing well and works are scheduled to begin on site in late 2021
- The major project to upgrade fire systems to the Rotherhithe Tunnel is progressing through the concept design phase as scheduled and is due to complete in June 2021. Advance critical works were completed to repair the fire main, install additional CCTV, and correct faults to the tunnel equipment controller, to ensure the continued safe operation of the tunnel in advance of the major renewal
- Feasibility works have begun on the Blackwall Tunnel systems and Brent Cross structures
- Exploratory works to remove the pedestal casings and blast clean the pedestals on Hammersmith Bridge have been completed, and discussions are ongoing regarding the next stage of works with the DfT Taskforce, London Borough of Hammersmith and Fulham, and stakeholders

Public transport

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year expenditure forecast (£m)	Expenditure movement post plan (£m)
2020/21 - 2024/25	67	121	784	26

The Public transport Investment Programme and Project Authority was increased at the March 2020 Programmes & Investment Committee. This includes all spend from 2020/21 to 2022/23.

The Public transport programme is forecasting a decrease in gross expenditure of £26m from the Business Plan.

The portfolio is strongly supporting the delivery of new infrastructure and housing in London as part of the Housing Infrastructure Fund schemes over the next five years. This includes the commercial development for the Poplar depot (+£20m) which has now been transferred out of Public Transport to Commercial Development, to align with the business delivery.

Expenditure on the City Greenwich Lewisham Rail PFI contract for the DLR Lewisham extension is related to passenger volumes, which have been higher than forecast in the Business Plan, in addition to investment in the Woolwich Ferry, which has recently transferred into TfL as an asset.

This expenditure is offset by the delayed start for rail devolution, savings released on the new Routemaster buses refurbishment programme and an efficiency target applied to the portfolio, which have further reduced planned expenditure.

London Overground

Since signing the Grant Determination Agreement with the Ministry of Housing, Communities and Local Government and the GLA in August 2020 to begin work on the East London line project, TfL has taken the design work through option selection and commenced concept design. The current forecast for conclusion of the concept design stage is autumn 2021. Works have finished on site at White Hart Lane, West Hampstead and Crossrail stations, with close-out of handover documentation ongoing. Additionally, early design work has been completed on the Seven Sisters Access-for-All project, where the option selection report has been completed.

London Overground has completed the migration to the new asset management information system, Maximo, which is aligned with our corporate asset management

approach. We have completed documentation, training and end-to-end user acceptance testing, and we are now archiving the old system.

A variety of minor route-way infrastructure renewals are on programme for completion by the end of the financial year to further improve resilience on the core route.

A further eight Class 710 trains will be delivered later in 2021. These will be used on the Barking Riverside Extension as operational spares and to provide additional capacity to meet forecasted growth on the London Overground network.

Elizabeth line fleet

We are installing a safety system on the eastern and western Network Rail sections of the Elizabeth line to guard against inadvertent incorrect side-opening of doors at stations. This will complement the automatic correct side door control provided by Crossrail in the central section. The system uses new trackside equipment that verifies location so that the train knows the next station and position of the platform. Installation is in phases, with the eastern section (Liverpool Street to Shenfield) substantially complete in February 2021. Installation on the western section (Paddington to Heathrow and Reading) is in progress, and the system is planned to be brought into use in June 2021.

DLR

In Q4, construction activity continued at pace for our renewal projects, with the DLR team working closely with our contractors to monitor the coronavirus control measures in place at our construction sites and ensure they are mitigating the spread of the disease.

The Vehicle Control Centre borders (handover points from one control computer to another on the automatic train control system) signalling project achieved substantial completion following operational testing and successful commissioning of the new system configuration at Poplar Control Centre.

Procurement activity continued with contractors appointed for several DLR renewal projects such as replacement of critical power substation equipment at Bow Church and Royal Mint Street, renewal of platform stairs, station surfaces and a number of key lighting surveys contracts.

The lift system upgrade project completed the strategic milestone of successfully refurbishing and commissioning six lifts back into service before 1 March 2021.

City Airport took a leap forward with design approvals and works commencing, with the majority of the works completed this quarter.

The first phase of track fixing was successfully finished and has provided some valuable information for future phases. Designs and procurement of long lead items for future track work continues.

Another strategic milestone was achieved with two station buildings at Woolwich Arsenal being fully stripped and new waterproofed membrane installed within three months.

The GLA-funded Royal Docks stations programme continued, with concept designs now approved for Royal Victoria and Beckton Park. The programme was on track to complete concept design and enter the construction phase upon GLA agreement, however in March the GLA put the programme on hold due to funding uncertainty pending a decision at its June board.

London Trams

The Tram Replacement Rolling Stock programme will replace the life-expiring CR4000 fleet, which are experiencing declining reliability and have one of the lowest states of good repair categorisations across TfL's fleets. Within the last quarter, the programme has continued to learn lessons from internal and external fleet replacement programmes and developed project requirements through engagement with key stakeholders. It is now in the process of commissioning an infrastructure feasibility and tram market study to ascertain infrastructure constraints and their impacts on the current tram market offerings.

Work progresses on a Correct Side Door Enable (CSDE) technical solution for the fleet to mitigate the risk of tram doors opening on the wrong side of the platform. Roll-out has commenced on the Stadler Variobahn trams and is due to complete in Q1 2021/22. A contract has been awarded for upgrading the wayside tram communication equipment necessary to enable CSDE on the Bombardier CR4000 trams and the site work will commence in early Q1.

Our renewals programme continues across seven asset groups, including fleet, power, civils, systems and permanent way infrastructure. The design was carried out for the Lower Addiscombe Crossing track renewal which was completed in April 2021 and the design has progressed for the third phase of the Reeves Corner track renewal, planned for August 2021. The installation phase for the additional CCTV cameras on the Stadler fleet (Stadler Equipment Overhaul) has commenced and a contract has been let to undertake condition assessment and repair work on Tram 2547. Designs have been completed and tenders prepared for the Birkbeck Retaining Wall and Morden Road Staircase projects, and the OLE Parafil Replacement and Substation Battery Charger Replacement projects continue to progress well.

Santander Cycles

The programme to modernise cycle hire continues to progress, with Cubic developing the back-office upgrade through the design stages. There is ongoing engagement with Serco to explore measures to ensure Santander Cycles benefits from the latest market functionality for bicycle sharing systems.

Work has progressed on the cycle hire expansion element of the programme, with plans being developed to help contribute towards the business case. These will be further developed to form a recommended priority list of areas that would benefit from expansion.

London River Services

Work has been completed on installing a new belting system on the side of the ferries to help prevent wear when mooring to the pontoons. This was complemented by the installation of new fenders, which were installed over the Easter period in April 2021.

Optioneering and design work have progressed on various renewals to help support the reliability of the Woolwich Ferry. These include modification to the North and South Terminal approaches, upgrades to the link-spans and investigations into alternative berthing.

Surface technology

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year expenditure forecast (£m)	Expenditure movement post plan (£m)
2020/21 - 2024/25	17	128	292	20

The Surface Technology Programme and Project Authority was increased at the March 2021 Programmes and Investment Committee. This includes all spend (2020/2021–2021/2022) and expected contracted spend (2022/2023–2024/2025) required before March 2022.

The five-year expenditure has reduced by £20m from the Business Plan. The majority of this movement is the transfer of budgets of Taxi and Private Hire projects to the Professional Services portfolios (£15m). The remainder of the reduction is a blend of minor cost savings and scope changes across a large number of projects.

Roads technology

We are leading the way in delivering innovative road traffic management systems to make journeys by walking, cycling and on buses, as well as essential emergency services and freight trips, as efficient as possible. In March 2021, we successfully deployed the second release of the Common Operational View Incident Management System (COV IMS) into live use in the Network Management Control Centre (NMCC) within Surface Transport. This second release is a significant milestone, as it introduces new data sources and map layers to enable the NMCC to focus its response to incidents on our network around the Healthy Streets framework. The 4Ps (pedals, passengers, pedestrians and protection) are the foundation for incident management in COV IMS.

Operational safety and compliance

This area includes initiatives to improve staff safety using technology, including introducing body-worn video cameras for more front-line colleagues. Cameras have now been rolled out to 6,000 colleagues across London Underground stations, staffed bus stations, Victoria Coach Station, Woolwich Ferry, and to front-line officers within compliance and policing on street. These cameras have already been used to capture footage of incidents of aggressive behaviour towards front-line colleagues, which help our people feel safer.

Work is also continuing to deliver deployable enforcement cameras. Each year more than 4,000 people are killed or seriously injured in collisions on London's roads. Seventy-six per

cent of collisions happen at junctions – many of which involve moving vehicles contravening road traffic rules. Driving in bus lanes or waiting in yellow box junctions also negatively impacts bus reliability. These cameras can be flexibly deployed at locations not covered by existing CCTV cameras, which will greatly improve enforcement coverage, reduce collisions and support bus reliability. The tender process to select a camera supplier is well under way. The deadline for tender responses was 1 March 2021 and evaluation is in progress. We are on track to roll cameras out from late 2021.

Public transport technology

We are maintaining and developing technology to improve operation of our public transport networks and enhance customer experience. This includes replacing the booking and scheduling system for Dial-a-Ride, which will enable us to book and deliver more trips with the same number of vehicles. Procurement for this system is on track, with supplier selection questionnaire responses recently issued.

This area also includes replacing the iBus system. This back-office system is vital to ensure buses continue to operate effectively in London. Refreshing it gives an opportunity to improve bus passenger experience, with targeted enhancements including providing real-time information when a bus cannot follow its normal route and linking virtually to traffic lights at more junctions to help buses travel more quickly. We are preparing to commence the procurement process for the replacement iBus2 system.

Other

Technology and data

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2022/23	137	320	314	(5)	177

The Programme and Project Authority and EFC shown are for financial years 2019/20 to 2022/23 as per the approval given by the Programmes and Investment Committee on 6 March 2021. Values shown are for Technology & Data-funded projects only and exclude the Emergency Services Network, Public Cellular Network and Telecoms Commercialisation Project.

Net telecoms spend is included from financial year 2021/22 as it was included within the latest Programmes and Investment Committee approval.

iBus2 spend is excluded from financial year 2021/22 as it transfers to Surface Transport from 1 April 2021.

Payments

We received 19 responses to the early market engagement questionnaire in relation to the re-procurement of the Integrated Revenue Collection Contract, which expires in 2025. This was followed up by eight one-to-one discussions with interested parties. The information gathered will inform our procurement options analysis, with a view to a pre-procurement strategy being settled in the summer. On 1 March, the most extensive fares revision for five years was successfully implemented. This included changing fares that had previously been held as part of the Mayor's fares freeze commitment, and involved extensive testing and assurance processes, which were completed despite the pandemic.

Content and collaboration/Evergreen programme

The Evergreen programme is closing at the end of Q4, having successfully met its objectives of updating all obsolete PCs, moving all 32,700 users to Windows 10/Office 365, and all 44,323 e-mailboxes and archive data to Exchange Online. Legacy infrastructure is now in various stages of being de-commissioned. The consolidation of all legacy versions of Microsoft SharePoint sites onto SharePoint Online continues to progress ahead of schedule, with a total of 1,009 of 1,225 sites already completed. This project will give a common, online data platform for all TfL SharePoint sites, giving

improved accessibility and eliminating the cost and complexity of managing the obsolete infrastructure.

Hosting – data centre rationalisation and Cloud migration

We continue to transform our data centre Compute platforms and have now completed 80 per cent (up from 60 per cent in Q3). We have also addressed dilapidations and handed the lease back on two legacy data centre spaces, thereby avoiding the renewal cost of £4.6m.

Networks

We continue to deliver infrastructure to support the Home Office's national Emergency Service Network (ESN) communications system; in tunnels we are focusing on fixing the leaky feeder cable, with 342km fixed (81 per cent, up by seven per cent) and the same amount of fibre installed (342km). We have completed around 84 per cent of the required station cabling works (up from 51 per cent) at the first 70 stations and started work at two further stations. We have reached agreement with the Home Office to fund further works in 2021/22 up to a value of £30m to mitigate any impact on the overall ESN schedule of the delay in awarding the Telecoms Commercialisation Project concession and are currently planning this work.

Technical service operation

We have delivered the IT infrastructure to enable transition of the Woolwich Ferry Service to direct management by TfL, as part of the project funded from Rail and Sponsored Services. Projects continue to improve the resiliency of business IT services and management of our software licence requirements. We have also begun several projects to support the GLA's office moves, with installation of the required infrastructure, and submitted a proposal to manage GLA's IT services.

Enterprise resource planning

The SAP hosting project successfully migrated the SAP service used to run our Finance, HR and Procurement processes onto the Amazon Public Cloud on 11 January. This was a significant milestone as it brought our SAP enterprise resource planning infrastructure back into a supportable state while also creating the technical foundation for an SAP upgrade in the future. Importantly, this was achieved without any unplanned business disruption and will save us approximately £1.7m a year over the next 10 years.

Contact Centre operation

We continue to undertake projects to maintain the quality and efficiency of the Contact Centre services. These include re-tenders of contracts to outsource the handling of ticketing-related customer enquiries, and the replacement of the system used to manage our Lost Property operation.

Growth Fund

Forecast completion year	Spend to date (£m)	Programme and Project Authority (£m)	EFC (£m)	EFC movement post plan (£m)	Cost to Go (£m)
2029/30	0	284	284	(20)	251

As the Growth Fund schemes have developed, and costs and potential funding have become clearer, it has been possible to identify savings in required Growth Fund contributions.

The revised Budget classifies all Growth Fund schemes as fully meeting the Mayoral objectives but 'contingent on additional funding'. This means that, although all Growth Fund projects have already secured a strong commitment and a significant degree of third-party funding for their delivery, a further commitment by Government or other third-party sources is needed to complete their funding packages.

Over the last quarter, the Growth Fund has contributed to TfL's Financial Sustainability Plan processes and begun a review of the programme objectives considering the most recent funding agreement with Government and the emerging strategic priorities around economic recovery. The programme team are working to identify additional funding streams while continuing to support all urgent Growth Fund projects by providing case-making and programme-level support. We are working closely with the GLA, central Government and other partners to discuss further third-party funding for Growth Fund schemes.

2020/21 Strategic Milestone performance

Our 2020/21 strategic milestones for the projects or programmes covered in this report are listed below. The RAG status indicates delivery forecast against the current plan date in line with this key:

■ On time or early
 ■ 1-89 days late
 ■ 90+ days late

Commentary is provided on milestones that are forecast to be delivered more than 90 days late. These milestones also indicate the history of forecast date movements by showing the RAG status and variance (the number of days' difference) between the plan date and the forecast date at each quarter end.

Milestone description	Plan date	Actual/ forecast date	Status
Major Projects			
Four Lines Modernisation ■			
Completion of foundation for train maintenance access platform at Neasden depot	26 August 2020	16 July 2020	Complete ■
SMA03 Ready for revenue	31 January 2021	19 February 2021	Complete ■

The SMA03 Ready for revenue milestone enables 4LM to commission the SMA03 area, which was planned and achieved in early March 2021. This Ready for revenue milestone included all the necessary work required in order for SMA03 to be considered ready for commissioning.

The milestone was initially set as of January 2021 to allow time for all the works and the Go live which, as mentioned, was achieved on time in March 2021. The delay to the milestone was due to some software fixes that needed to be applied. This resulted in this milestone being delayed by a couple of weeks, but within the range of the March 2021 planned commissioning date for SMA03.

Although this milestone was completed later than planned, it had no impact on the SMA03 commissioning date.

DLR Rolling Stock and Systems Integration ■

Detailed train design complete.	9 December 2020	9 November 2020	Complete ■
---------------------------------	-----------------	-----------------	---

Piccadilly Line Upgrade programme ■			
One-person operation CCTV (design and build) approved by TfL for contract award	14 July 2020	14 July 2020	Complete ■
New passenger trains – Complete the detail design of the new Piccadilly line train	31 March 2021	5 March 2021	Complete ■
Network extensions			
Northern Line Extension ■			
Completion of 22kv installation, necessary for providing full traction power for the new extension to Battersea	1 September 2020	1 September 2020	Complete ■
First test train to run on the Northern Line Extension	25 December 2020	19 December 2020	Complete ■
Silvertown Tunnel ■			
Completion of pump test boreholes and all geotechnical surveys for the north site of the Silvertown Tunnel	15 September 2020	24 August 2020	Complete ■
Contractor compound set up to commence piling operations	29 March 2021	18 January 2021	Complete ■
		Actual/ forecast date	Status
Barking Riverside Extension ■			
Completion of Thames Water works to divert sludge main at Pier 14	23 July 2020	12 August 2020	Complete ■
Cadent Gas site attendance delays. Traffic management delay on the first day of the works and slower progress due to safety restriction measures.			
Completion of piling on all piers	23 December 2020	20 October 2020	Complete ■

Major stations ■

Bank station – Completion of the tunnel primary lining for the new DLR triple escalator	1 September 2020	5 September 2020	Complete ■
---	------------------	------------------	------------

Concept design was prepared using generic loading information. It was subsequently established that specific bollard loading information would be required to confirm the structural element of the concept design. As the bollards are patented products, a commercial arrangement with the manufacturer is required to obtain the necessary information. This has taken a number of months to progress, but the arrangement is now in place. The loading information will now be assessed by our engineers to confirm the preferred design.

New transformer room complete and power on for supply to the new station ticket hall.	22 February 2021	18 December 2020	Complete ■
---	------------------	------------------	------------

London Underground

Stations renewals and enhancements ■

Stations – Restart of construction activities at 12 sites (Amersham, Harrow-on-the-Hill, Osterley, Cockfosters, Mill Hill East, Debden, Ickenham, Wimbledon Park, Tottenham Hale, Acton Train Maintenance Shed, Bromley-by-Bow and Finsbury Park)	31 July 2020	29 July 2020	Complete ■
Accessibility – Step-free access available at six more London Underground stations	31 March 2021	21 June 2021	■

In 2020/2021, the Accessibility programme delivered three step-free stations, and three additional sites are currently still in progress at Osterley, Ickenham and Wimbledon Park. Testing and commissioning, and lift installation delays at Wimbledon Park are causing the slippage against the milestone target from Q4 2020/21 to Q1 2021/2022. Delays at Osterley and Ickenham were due to testing and commissioning activities, however Osterley is expected to be brought into use at the beginning of May.

Track renewal – 52-hour possession on the Piccadilly line to re-rail track between	6 July 2020	6 July 2020	Complete ■
--	-------------	-------------	------------

Heathrow Terminals 1, 2 & 3 and Hatton Cross on the eastbound tunnel			
Track renewal – 2.7km of renewed track delivered	9 January 2021	7 December 2020	Complete ■

Power, cooling and energy – Factory acceptance test of the new London Underground power control system comprising hardware, software and functionality	22 February 2021	4 June 2021	■
--	------------------	-------------	---

The amount of works required to achieve a fully assured design prior to the factory acceptance test exceeded expectations. In addition, the pandemic and associated travel restrictions have significantly impacted productivity of the engineering activities. The supplier is based in Sweden, making end user training and on-site system development extremely difficult.

Healthy Streets ■

Old Street roundabout removal – Permanent traffic switch complete	31 March 2021	18 January 2021	Complete ■
Streetspace for London – Complete 40km of improved cycling infrastructure	31 Mar 2021	31 Mar 2021	Complete ■

Air quality ■

Congestion Charge changes – Go live	22 June 2020	18 June 2020	Complete ■
Direct Vision standards – Go live	1 March 2021	1 March 2021	Complete ■
Low Emission Zone stronger – Go live	1 March 2021	1 March 2021	Complete ■
Rapid Charge Point network – 300 Rapid Charge Points installed	30 December 2020	17 December 2020	Complete ■

Assets ■

Victoria Coach Station infrastructure – Complete fire system works on site	17 October 2020	22 September 2020	Complete ■
Public transport ■			
Trams: Reeves Corner – Embedded rail track renewal. Section one complete	14 September 2020	31 August 2020	Complete ■
DLR – Six lifts refurbished across the DLR network and brought into use	1 March 2021	28 February 2021	Complete ■