

Transport for London

Investment Programme Report

Quarter 2 2020/21

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Introduction

This report provides an update on a range of projects that will create world-class transport services in London. This report covers Quarter 2 2020/21 (26 July 2020-17 October 2020).

The quarterly investment programme report gives a progress update on the major projects and sub-programmes that seek authority each year (unless extraordinary approvals are needed) to the Programmes and Investment Committee.

For each major project or programme, the financial and milestone data represents 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.

For a programme or project with a defined start and end, we include when it is planned to be substantially complete and being used by customers. Works that are delivered in a prioritised sequence, such as road resurfacing or track renewal, are referred to as 'annual' as they are controlled and measured within each financial year. This report only includes progress on committed projects and programmes.

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.

To ensure continued transparency, the EFC for projects is based on the current risk profile and opportunity realisation at the time of publication. As a result, it could fluctuate every quarter, but this does not automatically mean there is an increase in spend authority.

Owing to the coronavirus pandemic there is an unprecedented impact on our projects and programmes. As such, we are unable to accurately assess the full impact on all our EFCs but many have a revised budget.

We also include cumulative EFC movements for savings and efficiencies that have been embedded since our 2018 Business Plan, while protecting safety, services and reliability. Numbers in brackets represent an EFC increase and numbers without brackets represent an EFC decrease. 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 TfL Budget, which are net of any third-party funding.

The strategic milestones for the first half of 2020/21 – the key milestones listed in the TfL Budget – are detailed on page 40.

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 Line Modernisation, network extensions, and major station upgrades, which are covered on pages six to 15.

London Underground

This comprises stations, accessibility, track renewals, power, cooling and energy, rolling stock, and signalling and control, which are covered in pages 16 to 21.

Surface transport

This comprises Healthy Streets, air quality, public transport and asset investment. These are covered in pages 22 to 33.

Other

This comprises technology and data, TfL Growth Fund and the Elizabeth line (including Crossrail), which are covered in pages 33 to 39.

The impact of coronavirus

In March, to help fight the spread of coronavirus, the Government and the Mayor gave clear instructions for people to stop travelling unless it was absolutely essential to do so. For this reason, we brought all our construction projects, including Crossrail, to a temporary Safe Stop unless they needed to continue for operational safety reasons. We continued with essential maintenance of the transport network.

This was done to ensure the safety of our construction and project teams, and to help reduce the number of people using public transport. It was vital that the transport network was only used for essential journeys.

When work restarted on site, each project had a full review of the working practices, together with submissions from the supply chain on how they would manage their site and their workforce in accordance with social distancing guidelines. These were then reviewed by construction managers, with work only restarting once this had been completed.

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	4952	5412	5397	(58)	445

Given the impact of the coronavirus pandemic on our finances, we have conducted a review of ongoing projects to see where costs can be reduced while still delivering vital improvements to the transport network. In September 2020, we reviewed the Four Lines Modernisation programme to assess and challenge both cost and schedule. Following this review, the western branches of the District line will not be re-signalled as part of this programme. This means sections of the District line south of Fulham Broadway and west of Barons Court will remain under the existing signalling.

While this change will mean journey times in these sections will remain unchanged, we can still increase frequencies to up to 16 trains per hour, as originally planned. We will continue to assess whether we can convert this signalling in the future. The other elements of the project will progress as planned.

Across the wider programme, the combined effect of the coronavirus pandemic, changes to scope and ongoing challenges have resulted in an EFC increase. The revised Budget was based on anticipated savings through a combination of reduced contractors' costs and supporting our works with an associated schedule reduction. Since the Budget was set, a number of pressures have emerged mainly relating to Safe Stop commercial impacts, ongoing negotiations with the main signalling supplier and provision for works to consolidate the new signalling boundaries. We are working closely with the main works contractor and anticipate the outcome of our discussions to be ready for the Quarter 3 Investment Programme Report.

We have introduced 192 new trains and installed new signalling on parts of the Circle and Metropolitan lines.

In June, work restarted in phases with coronavirus-compliant processes. This enabled dynamic train testing, signalling installation works and depot construction activities to be done, with all post-coronavirus Safe Stop targets being met. Despite the challenges, such as training operational staff under current circumstances, the programme remains on track for the post-restart target of March 2021, when we will migrate the signalling between Euston Square, Monument and Stepney Green.

The delays from the pandemic and the complexity of re-planning works around future events, is expected to lead to an extension of the programme, and it is anticipated that the estimated final cost will increase to reflect this delay. The re-planning and revised cost estimate will be complete by quarter three.

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	133	245	192	(11)	59

The EFC includes the latest supplier estimate for Jubilee line optimisation, which remains uncommitted. In light of the cost increase, the delivery approach is being reviewed further.

While some of the works are standalone, many projects in this area are essential to other programmes, including Jubilee line upgrades and the Northern Line Extension, as well as reconfiguring the Northern line at Bank.

To enable the new capacity works, we have completed speed improvement and track works to the Northern line and continue to focus on power enhancements, including an upgrade to the signalling software on the Northern line. We have also commissioned a new wheel lathe at Morden Depot, a new coupling transformer at Stockwell and a new wheel lathe at Stratford Market Depot.

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	65	603	603	0	538

The contract for supplying the next generation of DLR trains by Construcciones y Auxiliar de Ferrocarriles has started, with final designs almost complete. The manufacture of jigs and fixtures for the train bogies and car bodies has started. A life-sized mock-up of the train has been delivered to the UK, and we have had several stakeholder and customer reviews. The final design for the Thales signalling has been accepted by the project team.

Coronavirus has caused a three-period impact on train manufacture. We have revised the depot delivery strategy, with the southern sidings works being deferred to 2022/23. This will protect the programme critical path and enable the northern sidings work to meet the revised programme. The depot works have also been delayed by one period because of the recent financial uncertainty. This will not delay the delivery of the replacement trains but will reduce the float to the acceptable limit.

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	214	3294	2911	26	2696

We recently reviewed all Major Projects work, which has led to this reduction in EFC. We did this to ensure stage 1 approved costs are clearly aligned with deliverables. We transferred £18m in programme management and integration resource costs to the signalling stage of the programme. The rolling stock risk was reduced by £8m following the review as the detailed design nears completion.

We have made good progress in the design for the new Piccadilly line trains. We collaborated closely with train supplier, Siemens, and have a plan to minimise the impacts

of coronavirus on the design programme. We remain on target to complete the final design in March 2021.

The key contract for the supply of One-Person Operation (OPO) CCTV systems was awarded in September to Panasonic. This is a safety critical system that provides the train operator with CCTV images of the platform so that they know it is safe to depart. The project is now moving into the design phase as planned.

We continue to collaborate closely with our partners on three demonstrator projects to create innovative solutions in support of the Piccadilly Line Upgrade that will drive down costs, while also improving safety and sustainability. This includes a new platform cooling solution that will help manage the temperature on the platforms and scalable offsite-constructed equipment rooms, which are cheaper, more sustainable and safer to install. Contracts have been prepared and works have started so we are ready for the benefits in late 2021.

We have also prepared the next stage of the key contract procurement, with a Supplier Pre-Qualification Questionnaire being issued for the upgrades to the London Underground high-voltage power network. This was issued in September with responses received in early November. We can now engage with the suppliers who have expressed and qualified, while also preparing the Invitation to Tender documents for release in the New Year. This work is necessary to support the increased number of trains and enhanced train performance.

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	983	1,260	1,118	12	135

The EFC reflects a recent review of all Major Projects, which assessed and challenged both cost and schedule. The EFC movement includes an updated risk view on the full known impacts of the coronavirus pandemic and related issues.

The Northern Line Extension is a twin-tunnelled extension from Kennington to a new terminus at Battersea Power Station, via a new station at Nine Elms. This will be a catalyst for the regeneration of the Vauxhall Nine Elms Battersea Opportunity Area. The extension is expected to be completed in autumn 2021.

We continue to make good progress across all our work sites. The primary civils and structural works are complete and fit-out of the two new stations and two new head houses continues.

On 25 October, we successfully completed high voltage energisation to the switch rooms, enabling us to start commissioning key systems and dynamic systems testing later this year.

The Northern line train cab simulators have been upgraded to include the extension ahead of programme, which will enable train operators to familiarise themselves with the route, in preparation for trial operations.

We continue to work with Thales to upgrade the design of signalling software, which are the key enablers for operating trains on the new line extension and service being available.

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	4	180	202	(24)	198

The EFC reflects the recent review of all Major Projects, which assessed and challenged both cost and schedule. The EFC includes an update on the full known impacts of the coronavirus pandemic and related issues, as well as estimate increases for user charging implementation and systems integration.

The tunnel will connect Silvertown and the Greenwich Peninsula, which are areas subject to significant planned redevelopment in the coming years. The new twin-bore tunnel, within the extended Ultra Low Emission Zone (ULEZ), will effectively eliminate congestion and improve air quality, with no increase in carbon emissions. It will also provide a transformative new cross-river bus network for east London, with plans for up to 37 buses per hour in each direction, all of which are expected to be zero emission from launch.

We have handed over a section of land in the south at Edmund Halley Way to Riverlinx and we are now in possession of the Brewsters site. We have started the mobilisation works to prepare the Greenwich site for the start of excavation and construction.

We have carried out intrusive and non-intrusive surveys to complete the utilities mapping and have had productive engagement with the utility companies. We have completed the ground investigation pumping tests on the Greenwich side and the pavement surveys continue along the Tunnel Avenue bus lane. We are doing unexploded ordnance surveys in the Greenwich and Silvertown work areas before the major works start.

Our procurement planning for the tunnel boring machine design is progressing, along with the methodology for its launch and procurement for the segmental lining of the tunnel tubes.

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	198	287	327	(12)	129

We recently reviewed all work across Major Projects and the EFC reflects this. We assessed and challenged both cost and schedule. The EFC includes an update on the full impacts of the coronavirus pandemic and related issues.

The increase in EFC is driven by the impact of the Safe Stop and inclusion of coronavirus risks, mainly relating to prolongation associated with securing Network Rail possessions and coronavirus control measures. The EFC remains under close review and we continue to collaborate with the main works contractor to review all options to mitigate cost increases and minimise risks.

The EFC exceeds Programme and Project Authority and this will be addressed through our governance by December 2020.

We are delivering a new rail link to serve the 10,800 new homes planned for the Barking Riverside development area. We will build a spur on the London Overground east of Barking, to extend the Gospel Oak to Barking service to a new station at Barking Riverside. The extension is around 4.5km from Barking station. It includes modifications to

the existing Network Rail infrastructure and new lines running on a viaduct of around 1.5km. A four-carriage London Overground service running at 15-minute intervals is planned.

We have completed the Thames Water sludge main diversion at Pier 14, which enabled the piling works to be completed in this area. In October, we completed all the piling activities, 1,195 piles, which was a key milestone for the project. We also installed 265 beams at the south viaduct beam and poured 18 concrete decks, and the parapet installation is nearly complete. Works are ongoing at Piers 13 and 14 on the north viaduct and we continue with the installation deck spans and pouring of the concrete decks.

The new station structure can be seen from street level, with all the steelwork and external blockwork complete. We continue to install the cladding and glazing. We have completed the internal blockwork to create areas for retail units, cycle storage and operation equipment.

We continue to work on the rail systems during weekends, and have completed permanent way, overhead line equipment, signalling and telecoms activities through the summer and autumn.

Some uncertainties remain, which mean the estimated service start date is now forecast for autumn 2022. The team is working through the detail to give greater programme confidence.

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	542	656	702	0	160

We recently reviewed all work across Major Projects and the EFC reflects this. We assessed and challenged both cost and schedule. The EFC includes an update on the full impacts of the coronavirus pandemic and related issues. An authority increase was also approved at the October Programmes and Investment Committee meeting.

The EFC remains stable since we set our Revised Budget. We continue to review risk mitigations each period, along with opportunities to reduce the EFC. We continue to collaborate with the main works contractor to identify and realise potential savings and mitigate the impact of the coronavirus pandemic.

We are boosting capacity at Bank station by 40 per cent. This includes creating a new Northern line tunnel, platform and circulation spaces, a new entrance on Cannon Street, the introduction of step-free access to the Northern line, additional interchange between the DLR platforms and two new moving walkways between the Central and Northern lines.

We have various safety measures in place following the coronavirus pandemic and the team continues to plan and prepare for the risk of an outbreak on the site. Face coverings are mandatory while in transit between work locations, in line with guidance from the Construction Leadership Council.

All tunnelling excavation works are now complete, apart from the two ‘tie-ins’ between the new and existing Northern line southbound running tunnels, which will be excavated during the Bank blockade. This marks a major milestone since tunnelling began in 2017. Good progress is being made on the remaining civil works, which are due to be completed late January but with a stretch target of the end of 2020.

The project is now well into the fitout phase. We have installed the ductwork for the mechanical ventilation system throughout most of the new Cannon Street entrance building. Framework for new cladding finishes and new bespoke integrated service booms are being installed in new and existing parts of the station. New cable management systems are also going in throughout the new Cannon Street entrance, as well as within the newly completed service boom frames. We have also started to install a new fire suppression system. The overall project is due for completion in 2022.

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	3	*	*	*	*

*This information is withheld for reasons of commercial sensitivity.

A new station entrance and ticket hall for the Northern line was part-funded by the Mayor’s Strategic Infrastructure Fund. This will be provided as part of a private sector re-development of the Elephant and Castle Shopping Centre, significantly increasing station capacity. The developer will construct a new station box as part of its scheme. We will fit-out the ticket hall, create step-free access and build tunnels connecting the ticket hall to

the existing Northern line platforms. Future interchange with the Bakerloo line will be safeguarded within the design and construction of the new station box.

We have completed our concept design and work is ongoing to integrate the design and construction requirements within the wider development. Engagement with the developer is focused on negotiating the Development Agreement and Section 106 (Supplementary) agreement. Subject to confirmation of funding and pending agreement of terms and conditions, we anticipate entering into these agreements in spring 2021. Surveys and detailed design will follow with prioritised enabling works delivered in 2021/22. Tunnelling works will start once the station box has been handed over by the developer in 2024.

The developer has achieved vacant possession of the existing centre and ‘soft’ demolition has begun ahead of substantial demolition.

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	14	11	78	1	65

This project is fully refundable by HS2 Limited and the scope of works is dependent on third-party requirements. The new EFC is based on more detailed analysis of the scope and impacts of the works as we understand them at the current time.

High Speed 2 (HS2) is a new high-speed railway connecting London to the West Midlands and the North of England. Our work consists of assuring the design and delivery of new assets, infrastructure and operational facilities at Euston and Old Oak Common and protecting our operational networks and services.

HS2 Limited’s construction activity has continued across all sites in London under COVID-19 secure conditions. This includes the completion of enabling works and the start of piling for the station box at Old Oak Common, site clearance and mobilisation at Euston, including preparatory works for the new London Underground substation and ventilation building, and utilities diversions along the Hampstead Road. Discussions are also under way for the enabling works for the new interim taxi rank at Euston station.

We continue to provide input into the Department for Transport-led study on Euston, following publication of the Oakervee Review earlier this year. The study is seeking the

most effective way to deliver HS2 at Euston, recognising design requirements and constraints from all stakeholders.

Joint management processes between ourselves and HS2 Limited have been published and shared with the supply chain. These ensure ways of working between HS2 and us recognise and respect each partner's interests and objectives, while complying with the relevant agreements.

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	183	535	1131	0	948

As the gateway to London Underground, our 270 stations are a key part of the customer experience. They must be able to safely accommodate current and future passenger demand and provide efficient and pleasant journeys for all customers. We must manage and improve our station assets to maintain reliable access to the network.

Several station enhancements are taking place alongside commercial development opportunities to generate new income streams for us, while securing alternative third-party funding sources for station delivery.

As part of our In-Station Retail Programme, we have completed the shell and core works associated with the new units at Shepherd's Bush, King's Cross St Pancras and Bond Street and have nearly completed work at Liverpool Street, North Greenwich and Oxford Circus. Work continues on a nine-unit development at Canary Wharf, which is on target for completion by March 2021. This is combined with 13 stations that currently sit within our retain pipeline, which are all passing through the feasibility and concept design stages.

There are several key deliverables for this area, including:

Knightsbridge

The design and build contract for the fit out of the new Hooper's Court and Brompton Road entrance was let in August 2020 and the design is progressing well. The build contract for the fit out of the lower passageways is due to be let in late 2020.

Colindale

Work began on the detailed design of the capacity enhancement and step-free access project in September. The ticket hall layout has been finalised following consultation with local staff and union representatives. Discussions are taking place with the London Borough of Barnet and geotechnical investigation works began in October 2020. Subject to approval to start construction, the step-free access and ticket hall work is forecast to be complete in spring 2023.

Tottenham Hale

There has been good progress and the foundations and steelwork of the final phase are now complete. Roofing has also begun. Glazing and cladding works are due to start shortly and should be substantially complete by March 2021.

West Ham

Works have begun on the TwelveTrees Park development with our partner Berkeley Homes, which is delivering around 4,000 new homes and associated transport infrastructure, including a new London Underground station entrance. Enabling works adjacent to the Jubilee line eastbound track are ongoing to prepare the area for piling, which is due to start in 2021.

Paddington

We are working with Great Western Developments to construct a new entrance to the Bakerloo line, with an enlarged ticket hall and step-free access to the platforms as part of its redevelopment of adjacent buildings. In October 2020, we completed the enabling phase of the project by opening a new emergency escape staircase, which has enabled the permanent closing of the Network Rail entrance to the ticket hall. Works can now proceed on the full demolition of the old ticket hall to make way for the new station and lift shaft construction.

Walthamstow Central

Work restarted in summer 2020 with the project team supporting the concept design to take into account the development around the station. This is targeted to be complete by March 2021. The overall project includes a new station entrance, a new large lift, two additional escalators and a secondary means of escape with fire fighter access.

South Kensington

We have completed procurement for the early ticket hall enabling works, which will complete in late 2020. We continue to explore options for the capacity upgrade and step-free access. Replacement of the escalators serving the Piccadilly line is due to start by March 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	85	176	175	0	90

We are making 12 stations step free through the London Underground Accessibility Programme. Since 2018 we have delivered step-free access at Newbury Park, Buckhurst Hill, South Woodford, Mill Hill East and Cockfosters. Works at the remaining seven stations are at an advanced stage and are due to complete by the end of 2021. At Amersham, Debden, Osterley and Ickenham, main works are largely complete and lift installations are progressing. At Wimbledon Park, Harrow-on-the-Hill and Sudbury Hill, main works have started with the installation of lift towers, brick work and system upgrades to prepare for the lift installation.

Three further projects at Hanger Lane, Burnt Oak and Northolt are currently paused pending a further review, following the financial considerations of the coronavirus pandemic.

All the completion dates have been impacted by coronavirus, with a 12-week Safe Stop initiative on all our construction sites, productivity reductions on site owing to altered working practices, and impacts on our supply chain.

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	23	73	81	0	58

This remains on schedule, improving the reliability and safety of the railway. In Quarter 2, we started five ballasted track renewal sites, renewed 0.6km of deep Tube track, 0.4km of flat bottom conversion and re-rail and started work on two drainage sites.

The tender documentation for replacing our track recording vehicle, which records and monitors the alignment and condition of the track, is undergoing final review before engaging with the market.

We have let a contract for the stabilisation of the cutting between Grange Hill and Chigwell. The works will stabilise the cutting slope for the next 100 years or more and the risk to the operational railway will be eliminated.

Power, cooling and energy

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	58	90	88	0	30

We installed 598 roof-mounted solar photovoltaic modules (solar panels) on the new train modification unit in Acton Depot last quarter. The new solar panel system has been designed to meet a target of 152,075 kWh/year renewable energy generation, which will save 58.2 tons of CO2 a year and provide clean renewable energy for many years to come. The project is targeting completion in the first half of 2021/22.

As part of Four Lines Modernisation works across the London Underground network, existing substations are being upgraded to accommodate the associated increase in power loads. The upgrades create more heat within several substations, which, if left untreated, could affect equipment and, in extreme cases, train service. We had nearly installed all main construction works at Shepherd's Bush substation in April 2020, before the Safe Stop of all construction sites. Work started at Earl's Court substation in early August 2020, with Victoria substation, Notting Hill Gate and Shepherd's Bush to follow. This package of work is due to be completed by the end of March 2021. A tender for the final package of works has been undertaken. Contract award is forecast for early December 2020, with a view to start on site in late January 2021 and aims to complete the package in mid/late 2021.

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)
2023/24	251	525	972	0	721

We have improved the Bakerloo line fleet to ensure continued reliability and started three-car prototyping at the Acton works depot. On the Jubilee line, all 63 trains have been refurbished to comply with rail vehicle accessibility regulations and are back in service. The Central Line Improvement Programme is progressing, with the train management system being tested and first AC power traction unit being installed on a prototype train. Following a detailed review of the programme, the business case and benefits are still positive and there is a greater understanding of the systems integration required and the associated timescales. The delivery approach has been revised to create a realistic delivery plan with longer timescales, which was endorsed at senior level.

We continue to work with our supply chain to enable the improvement programme on the full fleet. A full set of lifting jacks are now on site in Acton, and these will be quality checked before the train modification unit becoming available. This recently achieved several key milestones, with the completion of the civil construction works along with the start of the fit-out, which gathers pace throughout the remainder of the year.

The mechanised renewals vehicle will improve the way track is renewed in the deep Tube sections of the Bakerloo, Central, Jubilee, Northern, Piccadilly and Victoria lines. The three allocated wagons have been fully refurbished and returned to Ruislip Depot. Design of the ancillary equipment is progressing well. Fitment of the track renewal equipment will begin shortly.

Four of the seven pre-production engineering wagons manufactured by CRRC in China have reached the UK following a two-month journey by sea. These wagons will be tested off network before being joined by the remaining three pre-production wagons on our network in early 2021 for infrastructure testing. Once these wagons have been fully tested and approved, the remaining 66 wagons will be built and shipped.

The two Kirow cranes are now approved for use within Ruislip Depot, supporting lifting and loading operations and are already adding benefit. The introduction of these cranes delivers safety and productivity benefits to the engineering operations in Ruislip Depot. Operator and maintainer training for these cranes is ongoing.

Early market engagement for replacement battery locomotives has started and responses are due back in November. This project will look to enhance the existing engineering fleet to ensure they remain operational while a replacement fleet is considered.

Signalling and control

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	94	145	180	0	86

We continue to improve the operational safety and remove non-compliant systems across several projects. We have replaced the control centre UPS systems at Allsop Place and Highgate Control Centres. Lighting has been converted from fluorescent to LED at eight stations and escalator electrical isolators have been replaced at 23 locations. We have upgraded the air conditioning and building management systems at Neasden Control Centre and replaced platform tactiles at Acton Town. The fire detection control panels at Greenwich power control centre have been replaced, as have the battery charger systems at Manor House and Croxley Hall substations.

Work has started 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 Operated (OPO) cameras at a further 11 platforms to provide safer access to and from the trains.

We have completed the detailed designs for the project that will replace the system-wide power control system to improve safety and reliability, enabling manufacture of hardware and software development to begin.

We have progressed works to provide signalling improvements across the Bakerloo and Central lines. We have completed a control room refresh for the Waterloo & City line, which will, although not currently in operation, improve reliability when it reopens.

Surface Transport

Healthy Streets

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year gross expenditure (£m)	Movement against Business Plan 2019 (£m)
2020/21 - 2024/25	61	146	1097	54

Authority is currently £146m for the period 2020/21 to 2024/25, based on the latest paper to the Programmes and Investment Committee from July 2020. The current authority covers the delivery of the Streetspace for London programme and restart of projects following Safe Stop. The spend authority also includes the transformation of Old Street Roundabout.

Following the end of Quarter 2, a further £75m authority was granted in November to deliver Healthy Streets and active travel programmes in the second half of the year.

The estimated five-year gross expenditure shows a reduction of £54m in 2020/21 against the Business Plan. This reflects reduced forecast spend in the second half of the year to align with Government funding. Future year forecasts remain in line with the Business Plan.

The 2020/21 forecast currently reflects £95m in the second half of the year, with £75m coming from our recent Government funding agreement and £20m from the Active Travel Funding. We will continue to safely deliver active travel programmes and support the plans of the London boroughs through the Local Implementation Plan process.

Highbury Corner

The protective security measures were installed in September 2020 and all the remaining snagging and defect work was completed in late October. This scheme has now substantially improved the safety and amenity for pedestrians and cyclists moving through this busy junction.

Old Street Roundabout

Construction work restarted in June following the Safe Stop process and works are progressing well on both the highway elements and in the station concourse. We successfully completed the interim traffic switch in late October 2020, ahead of the main traffic switch, which remains on track for January 2021. The scheme will substantially improve safety for pedestrians and cyclists at this major junction.

Cycleway 4

Work on the section between Tooley Street and Rotherhithe Roundabout was completed as planned on 11 September and the route is now in operation. The remainder of the route is being considered under the Streetspace for London programme.

Cycleway 9

Work on the Kew Bridge junction was completed as planned on 3 September. The remainder of the route is being built under the Streetspace for London programme and works began on 16 September.

Safer Junctions

Schemes are now complete at Camberwell town centre, Clapham Road/Union Road and Edgware Road/George Street. The Edgware Road corridor and Kingsland Road/Balls Pond Road schemes have been prioritised for construction in the second half of the financial year.

Streetspace for London programme

We are working with the London boroughs to rapidly deliver a series of temporary interventions in response to the coronavirus pandemic. We now have confirmation of funding from the Department for Transport for the second half of the financial year. The statutory guidance for delivering these schemes was updated in mid-November to introduce additional consultation requirements compared with the previous guidance issued at the start of the pandemic. This will impact the rate of delivery, budget and forecast compared to the first half of the year.

The programme is designed to enable more people to walk and cycle, improve the efficiency of buses, while enabling more space for social distancing. It encompasses a range of measures, and we have exceeded two milestone targets of 57km of new and improved temporary cycle facilities and 22,000sqm of additional space for pedestrians at crowded spaces on our roads. All activity is being delivered at pace, using temporary measures and traffic orders.

By mid-October, we had delivered:

- 61.6km of new and improved cycling facilities on the borough's and our roads, with a further 27km in progress

- 22,000sqm of extra space at 35 sites on our roads, with all sites now under review for any necessary amendments
- 79km of 24/7 bus lanes on our roads and 7km in construction
- six new cycle hire docking stations
- 20 sites with Green Man Authority and traffic signal timings reviewed at more than 2,200 sites
- 619 borough schemes, including 322 school streets, 181 projects adding space for social distancing at crowded sites, and 88 Low Traffic Neighbourhoods

We have also installed bus gates at Bishopsgate/Gracechurch Street to limit through traffic to bus and cycles only between Monday and Friday, 7am to 7pm, with access maintained to and from side streets. Early monitoring suggests that the project is delivering a two-minute saving on bus journey times.

Air quality

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year gross expenditure (£m)	Movement against Business Plan 2019 (£m)
2020/21 - 2024/25	68	250	614	-196

Our current level of authority is lower than our five-year forecast because we only have authority until 2021/22 for our major programmes.

We forecast an increase in expenditure of £196m from the 2019 Business Plan, mainly due to broadened scope for bus electrification. We plan to deliver a zero-emission bus fleet by enabling appropriate power supply at bus garages for overnight charging, costing £130m for grid to gate and £48m for enhancing bus charging options.

As a response to the coronavirus pandemic, we swiftly made temporary changes to the Congestion Charge, including extended operational hours, which enabled us to reduce costs by working innovatively. The future re-let of our contract for Road User Charging is also included in this programme forecast.

ULEZ expansion

We are developing a new cloud platform to deal with the increased data volumes generated from the larger zone, which is well under way, as is work to ensure the existing systems will operate correctly in the new cloud environment.

The installation of enforcement cameras has progressed, with more than 700 site surveys completed, and 150 cameras installed. The new Siemens camera data processing system is nearly complete. All boundary signage initial site surveys have been completed.

A new phase of scheme marketing activities began on 5 October, with advertising in a variety of mediums. The ULEZ expansion is still due to launch in October 2021.

Low Emission Zone and Direct Vision Standard

On 28 September, we confirmed that the stricter emissions standards for heavy goods vehicles through the Low Emission Zone (LEZ) and enforcement of the Direct Vision Standard (DVS) would start in March 2021, a delay of more than four months from the original launch, owing to the pandemic. The introduction of the new LEZ standards will be accompanied by a grace period for any vehicle owner that has booked but is awaiting the fitting of emissions abatement equipment. The testing of the required systems and web changes have progressed on schedule.

Delivering the LEZ, DVS and ULEZ expansion to the current launch dates remains feasible through ongoing remote working methods for all but the camera and signage site-based works, which continue with appropriate social distancing and safety measures in place.

Vehicle scrappage and support schemes

The scrappage schemes were rolled out to support the introduction of the ULEZ and the tightened LEZ emission standards. The schemes have been very successful, partly due to a policy decision in January 2020 to increase grant payment up to £7,000 for scrapping a light vehicle that doesn't meet the ULEZ standards, plus a £2,500 contribution towards running costs (including insurance) of a replacement fully electric vehicle. We have also been running a ULEZ Car and Motorcycle Scrappage Scheme (UCMSS) since October 2019 for those on low incomes or with disabilities. This has removed more than 2,700 vehicles so far, with owners receiving £1,000 for motorbikes and £2,000 for cars. Owing to an unprecedented demand and a limited budget, we agreed with the Mayor to suspend the scheme to van owners on 28 August 2020. The scheme remains open for charities to scrap minibuses, given their vital work during the coronavirus pandemic. The van scrappage scheme ran for 18 months and committed enough support to take 5,000 polluting vehicles off London's roads.

We also created a heavy vehicle grant scheme, which was launched on 28 September 2020. Owing to high demand, the scheme was suspended after two weeks of operation, with limited funds rapidly allocated.

Rapid charging

We have now installed 270 rapid charge points and, despite some delays related to the pandemic, are still aiming to meet our original target of 300 points by December 2020. Site-based works are continuing with appropriate social distancing and safety measures in place. Work continues on new hub sites at Baynard House in the City of London and Glass

Yard in Greenwich. Charge point installation work at the Baynard House hub is now complete with final commissioning to be done once the City of London enabling works in the building are complete.

Greener fleet

Currently, more than 8,890 buses meet Euro VI compliance or better, which is around 97 per cent of the core bus fleet. There were production and supply chain issues globally owing to the pandemic, which has resulted in the late delivery of some new buses and retrofits. However, we are working with bus operators and retrofit suppliers to accelerate delivery where possible, with the overall aim for the core fleet, excluding the additional temporary school buses, to fully meet the Euro VI standard by the end of 2020. This means the core bus fleet will be fully compliant with the new LEZ standards, which will now be introduced in March 2021. Our Dial-a-Ride operation has taken delivery of 94 of its 166 new Euro VI vehicles to help it comply with the forthcoming expansion of the ULEZ.

Mayor’s air quality programme

On 3 October, the Greater London Authority (GLA) published a report on the air quality improvements delivered since 2016. We have been instrumental in delivering the achievements the report highlights. From 2016 to 2019, the number of Londoners living in areas exceeding the legal limit for nitrogen dioxide fell from more than two million to 119,000, and the number of state primary and secondary schools in areas exceeding the legal limit for nitrogen dioxide fell from 455 to 14.

Asset investment

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year gross expenditure (£m)	Movement against Business Plan 2019 (£m)
2020/21 - 2024/25	41	303	1009	-245

The programme has a project and programme approval until 2021/22, so is only part funded in this five-year window.

Following the development of our 25-year capital plan for surface assets, we have created a robust plan of renewals, which has increased our expenditure by £245m over five years. The change in gross expenditure reflects the revised view of the necessary renewals required to maintain assets to ensure safety and reliability across our network. This is

crucial, as the impact of coronavirus has effectively extended the two-year pause on proactive renewals by a further four months.

We must invest in our assets to avoid degradation and loss of service. The full closure of Hammersmith Bridge is a reminder of the impact of historic under-investment. In the second half of the year, we have set aside £4m to contribute to the repairs to the bridge. As agreed with the Hammersmith Bridge Taskforce, the first priorities are to remove the pedestal casings and blast clean the pedestals to reveal the extent of the cracking, as well as to complete the detailed design for the emergency stabilisation works. We have now instructed our contractor to proceed with these works, which are due to start soon. We are supporting the Hammersmith Bridge Taskforce in identifying how the remaining stages of work should be funded.

The increased investment is across all asset classes, including £135m for our Major Asset Renewal Programme, which is delivering schemes such as the renewal of Rotherhithe Tunnel and the A40 Westway, £50m for other crucial highways infrastructure, £20m for bus assets, including the renewal of our historic Kingston Road bus station. Following the findings of the London Bridge inquest, we are installing protective measures on several bridges across London at a cost of £35m, to reduce the likelihood and impact of vehicle attacks on pedestrians.

The Asset Capital Programme of minor works restarted over the summer in a controlled way to accommodate new safe working practices. This meant carriageway resurfacing works were restarted, with 37,000sqm completed by mid-October. Similarly, smaller bridge refurbishment works were restarted at Colney Hatch and Danson Road, as well as refurbishment works at various bus stations. The programme to replace bus stops and shelters also restarted, with 135 units being replaced in the first half of the year and traffic signal upgraded at six locations across the city on our roads and at eight locations on borough roads. Finally, 80 lighting columns were replaced along the A2 during the summer.

We completed the upgrade of fire systems at Victoria Coach Station in October, in accordance with the London Fire Brigade's enforcement notice. At Vauxhall Bridge, the project to replace the waterproofing and expansion joints to the deck has progressed to plan, with half of the bridge completed by mid-October. The works are on track to complete by early December.

Design work is also progressing to plan on the bridge expansion joint scheme on the A40 Westway and the protective security measures programme to install permanent measures along the central London river bridges. The major project to upgrade fire systems to the Rotherhithe Tunnel is progressing through the outline design phase as scheduled and feasibility works have begun on the Blackwall Tunnel systems and Brent Cross structures.

Public transport

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year gross expenditure (£m)	Movement against Business Plan 2019 (£m)
2020/21 - 2024/25	30	121	754	-221

This programme is forecasting an increase in gross expenditure of £221m from the 2019 Business Plan.

The programme is strongly supporting the delivery of new infrastructure and housing in London as part of the Housing Infrastructure Fund and Access For All schemes over the next five years. These schemes include DLR station upgrades (£50m), which will regenerate a former industrial area around Royal Docks, and a scope of works along the London Overground in east London to unlock around 14,000 new homes by increasing the frequency of trains (£85m).

We continue to develop plans for rail devolution, which would bring Great Northern Inners services from Moorgate to Hertford North/Welwyn Garden City/Stevenage into us from September 2022 at low cost. This would increase our expenditure by £32m against the 2019 Business Plan.

In July 2020, we paused the Rotherhithe to Canary Wharf ferry crossing, which has reduced expenditure in this programme by £69m. The crossing would be an entirely new service for us, requiring significant capital investment as well as ongoing operational funding. Given the lack of funding sources available, there is currently no viable funding package for its full delivery and operation, so it was decided to pause the programme. The crossing would enable better cross-river journeys in the area and would relieve pressure on existing transport connections and support sustainable growth, so we will consider this again in the future.

Following the development of our 25-year capital plan across our transport modes, we have developed a robust plan of renewals that will ensure network performance and reliability. This has increased cost across all modes by £125m against the 2019 Business Plan.

London Overground

On the East London Line Enhancement Programme, a Housing Infrastructure Grant Determination Agreement has now been signed between us, the Ministry of Housing, Communities and Local Government and the GLA to deliver infrastructure improvements that support housing growth along part of the London Overground. Work has started on early designs for the station, but further operational assessments, designs and costs will need to be considered before a decision is made on whether we can proceed.

Works have largely finished on site at White Hart Lane, West Hampstead and Crossrail stations, providing increased station capacity and step-free access. Minor snagging works are progressing while we work through the handover and closeout process.

We have successfully replaced the integrated station management system to programme and on budget. The new system provides significantly enhanced customer information, while improving further passenger safety and security at stations.

London Overground is also in the final stages of migrating to the new asset management information system, Maximo, which is aligned with our corporate asset management approach.

A variety of route way infrastructure renewals have resumed after the Safe Stop and are on programme for completion by the end of the financial year to further improve resilience on this critical section of London Overground infrastructure.

New Class 710 trains are now operating between Gospel Oak and Barking, Watford Junction and Euston line, and on West Anglia routes out of London Liverpool Street. These new British-built electric trains have replaced the oldest rolling stock operating on the London Overground, meaning customers now receive a more reliable service as well as interconnected walk-through carriages, free Wi-Fi, real-time information screens, USB charging points, air-conditioning and more wheelchair spaces. The existing Class 315 trains, which were around 40 years old have now been retired from service.

A further 11 Class 710 trains will be delivered by early 2021. These will be used on the Barking Riverside Extension, as operational spares and provide additional capacity to meet forecasted growth on the London Overground network.

DLR

The DLR team and our contractors were brought back from furlough in Quarter 2 as projects restarted through a phased approach. Adequate provisions were considered to mitigate against the impact of coronavirus before works could restart.

Key designs were approved and works restarted on the signalling upgrades of the Vehicle Control Centre borders and the installation of signalling hardware.

There was a successful tender for the replacement of the east route ring main and we are now able to appointment a Principal Contractor. Associated power projects have been sent out to tender.

We completed works at Custom House and the new mezzanine was opened, improving access to the ExCeL and providing a new interchange with Crossrail. This station is the main access to NHS Nightingale Hospital London, and as such critical to the movement of key workers.

In Quarter 2, we also completed the swingnose crossing at Bow Church, rerailing at All Saints and Limehouse Curves, replacement of structural expansion joints at Limehouse and Devons Road, purpose built track access on the north section of the system, conversion of the lighting at Poplar Station to LED, upgrading the high-voltage power systems at Poplar and the continuing modernisation of the conductor rail at both depots.

The opening weeks of Quarter 2 also saw several tenders being sent out for works, which had previously been paused. We continue to make good progress and expect all tenders for this financial year to be either contractually appointed or out to market.

The GLA-funded Royal Docks Stations Programme continued, with concept designs submitted for Royal Victoria and Beckton Park. The programme is on track to complete concept design and enter the construction phase for the first two stations in 2021.

London Trams

As part of our commitment to make the tram network safer following the tragedy at Sandilands in 2016, we have now addressed the recommendations from the Rail Accident Investigation Branch. The physical prevention of over-speeding through an automatic braking system has now been introduced across the full fleet.

Our renewals programme continues across seven asset groups, including fleet, power, civils, systems and permanent way infrastructure. We completed work on the Reeves Corner Phase 1 and Love Lane track renewals during planned closures in August and September. We also completed re-railing works at Wandle Park and Beckenham Junction, contract award and design started on the Stadler Equipment Overhaul project for the addition of blind-spot CCTV cameras, and good progress was made on the CR4000 Cab Cooling project, with 15 out of 23 systems now commissioned.

Santander Cycles

A programme of works has started to modernise, electrify and expand the cycle hire system. This involves upgrading the back-office payment system, introducing e-bikes to the fleet and expanding the scheme to areas of potential growth.

We have completed a design study for the back-office payment system, which was carried out by Cubic and we have completed a feasibility study for the e-bike choice, which was carried out by Serco.

The next steps are to progress through robust internal assurance processes before starting the implementation in January 2021.

London River Services

Following the decision to bring the maintenance and operation of the Woolwich Ferry in house, notice has now been served to terminate the existing contract on 31 December 2020. We continue to engage with existing staff and the unions as we work towards improving the organisational structure and service operation, as well as planning essential maintenance and training over the holiday period.

The new operation will focus on resolving engineering issues outside of operational hours, closer relationships with suppliers and more control over costs and staff rostering. We are also improving local wayfinding, branding, customer information and staff customer service training.

Surface technology

Forecast year range	Spend to date (£m)	Programme and Project Authority (£m)	Five-year gross expenditure (£m)	Movement against Business Plan 2019 (£m)
2020/21 - 2024/25	8	20	304	-150

Surface technology spend authority has been updated to authorise spend to 2020/21 only. The Programme and Project Authority is therefore below the five-year gross expenditure as the programme is only part authorised.

The three areas of focus are compliance and enforcement, safety and public transport, and sponsored services.

The new scope of the programme since the 2019 Business Plan is around £80m, including improving bus stations and operational colleagues' safety and security through technology, and additional deployable enforcement cameras to increase compliance on our network. We have identified several technology refreshes to operationally critical systems.

Several schemes costing around £20m were delayed from 2019/20 to 2020/21, which include our Surface Intelligent Transport System programme and the modernisation of our cycle hire scheme technology.

Following the development of our 25-year capital plan for Surface Technology, we have developed a robust plan of renewals that will ensure our systems are supported through a renewal cycle. It will fully identify the end-to-end system landscape of our complex systems and we are confident we have an appropriate level of funding to ensure systems continuity. This has increased our gross expenditure by £50m against our 2019 Business Plan.

Surface Intelligent Transport Systems

We are leading the way in delivering innovative new 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. Delivery of elements of the Surface Intelligent Transport System (SITS) programme where we have contractual commitments has continued despite the pandemic, with development teams able to work remotely. In August, we completed formal witness testing of the current phase of RTO system development. In September, we deployed the first release of our Common Operational View Incident Management System into live operation in the Network Management Control Centre. Work on the predictive element of SITS remains paused.

Operational safety and compliance

We are consolidating our approach so we can support a more versatile compliance, policing and on-street services operation. This will help people feel safe, supporting reliable journeys and generating efficiency savings.

This area includes procuring systems and services to support our licensing of taxi and private hire vehicles, drivers and operators. We have continued the procurement process to secure a supplier for this operationally critical system, with minimal impact from the pandemic. In early November, we entered the final stage of the tender process, with the project on track to award the contract in spring 2021.

This area also includes proposals to introduce body worn video cameras for more front-line colleagues. Following successful site surveys, we rolled out cameras to six further sites in late August: Seven Sisters, Tottenham Hale and Kings Cross St Pancras Underground stations, Victoria and Hammersmith bus stations, and Compliance, Policing and On-Street Services officers. 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 procure deployable enforcement cameras. We have used the insights gained in an early market engagement exercise in the summer to inform our procurement strategy, detailed requirements and contract schedules. This exercise has provided valuable insights into the market preparedness to deliver following coronavirus and broader capabilities of cameras.

Public transport technology

We are maintaining and developing technology to operate our public transport networks and improve customer experience. This includes upgrading the technology systems that underpin the bus network, such as the iBus system, which provides real-time information on bus locations. It also includes replacing the booking and scheduling system for Dial-a-Ride, which will enable us to book and deliver trips more efficiently. In October 2020, we commenced the tender process for this system, issuing a Supplier Selection Questionnaire.

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)
2021/22	151	275	283	(8)	132

Payments

Passenger Validators are located at stations and tram stops where there are no gates so customers can touch in and out as required. Many are open to the elements and encased in metal to make them weatherproof but extreme hot has caused some to overheat and shut down. This summer, we painted 40 passenger validators with heat-resistant paint, which resulted in no hot weather shut-downs being reported this summer.

On 1 August 2019, we introduced an annual revalidation fee for new applicants to our 60+ scheme to ensure they continue to be eligible. This year, on the first annual renewal, we successfully implemented the process through which cardholders can revalidate their entitlement. Cardholders are contacted automatically on the anniversary of their card being issued and are given six weeks to revalidate their eligibility, after which their card will be cancelled if they do not.

On 4 September, we updated ITSO smartcard system to ensure smartcards issued by train operating companies outside London could continue to be validated and accepted. Funded by the Department for Transport, this critical update was sent to 20,000 devices across the rail and bus network in London. It was delivered ahead of the expected schedule with no disruption to the services provided.

Content and Collaboration and Evergreen programme

The Evergreen Programme is aimed at renewing more than 80 per cent of our desktop PCs and moving all users to Windows 10/Office 365. By mid-October 2020, 32,644 of 32,700 users had been moved and 44,247 of 44,323 e-mail boxes were migrated to Exchange Online, providing a richer user experience with access from any device at any location. Livelink is a key enterprise document management tool, largely used for engineering documentation. The current version is being upgraded to run under Windows 10 and is set to be completed in November 2020.

Microsoft SharePoint is one of our main departmental file sharing applications, which needed to be migrated to SharePoint Online. To date, all SharePoint 2007 sites, 235 SharePoint 2010 and 832 SharePoint 2013 sites have been migrated to SharePoint Online. Only the six most complicated 2010 sites remain that require customised development, which is currently under way.

Data centre rationalisation and cloud migration

We continue to refresh hosting activities to ensure the underlying infrastructure is available and meeting performance required, which hosts business and technical services.

Networks

We continue to deliver infrastructure to support the Home Office's national Emergency Service Network communications system. In our tunnels, we are focusing on testing the leaky feeder cable with 200km, around half, tested to date. We have completed about 45 per cent of the required station cabling works, up from 40 per cent, at 65 stations, previously 59. We have managed coronavirus-related inefficiencies since remobilisation in July but the risk of delays due to increased infection rates remains.

Technical refresh and technical service operation

The new service desk solution, which captures, manages and reports on our incidents and requests has been fully embedded into day-to-day activity and is delivering the expected improvements. More generally, multiple programs have been implemented to deliver and support changing and remote working technical needs for front-line and office-based colleagues.

Enterprise resource planning

The SAP Hosting project continues to deliver on schedule and within budget with the full migration of our SAP service used to run our finance, HR and procurement processes onto the Amazon Public Cloud to be completed in January 2021. Initial tests are very positive. This project removes significant infrastructure redundancy risk to our estate.

Data analytics

We have continued to work on our journeys and demand offering, publishing reports on our public-facing website. This includes using data from our ticketing system to provide an overall picture of how customers are travelling across our Tube and bus networks. The reports show indications of travel on our network rather than an absolute measure of passenger numbers.

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	261	261	(6)	261

This programme is dedicated to the third pillar of the Mayor’s Transport Strategy on using transport to unlock new jobs and homes. The programme allocates funding to support multi-modal and cross-portfolio transport schemes where a specific transport constraint is holding back economic and residential development and supports regeneration opportunities in some of London’s key growth areas. The Growth Fund currently contributes to around 12 transport schemes that will support more than 55,000 new homes and around 41,000 new jobs. Our investment in these projects has been supported by financial contributions from developers, as well as other funding partners, including the GLA.

Our 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 already have a strong commitment and a significant degree of third-party funding has been secured for their delivery, a further commitment by Government or other sources is needed to complete the funding package for them.

We will continue to review the programme, considering the recent funding agreement with Government and, where necessary, identifying other funding streams to progress the projects. We are working closely with the GLA, Central Government and other partners to discuss further third-party funding for Growth Fund schemes.

Elizabeth line

Liverpool Street

Work is needed to accommodate the full-length Elizabeth line trains at Liverpool Street station and a project is under way to lengthen platforms 16 and 17. Stage one of the works are due to be completed in a 10-day blockade over Christmas. All required designs have been submitted to Network Rail and are on track for approval in line with the programme.

On-network stations 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	92	94	95	0	3

The on-network station improvement programme has continued despite the impact of coronavirus. On the step-free projects work has continued remotely. At Maryland, Manor Park and Seven Kings stations, handover paperwork is 90 per cent complete and ready for submission before final handover to Rail for London Infrastructure. This had hoped to be completed in October but has slipped due to staff being furloughed. The final work is now due on 4 December 2020.

The step-free works at Hanwell, Iver, Langley and Taplow stations are nearly complete, with site meetings for handover held and final paperwork completed and signed by relevant parties. This has been submitted to Network Rail, the future asset owner, for review and approval, which is expected in December 2020.

MTR's station refurbishment programme has continued with works at Hanwell and Langley due to be completed by the end of 2020. MTR's work at Langley will deliver two new gate lines, an accessible ticket window, refurbished toilets and new customer information screens. At Hanwell, similar benefits will also be delivered but with colours and materials carefully selected to match the Grade II-listed station building. In 2021, MTR will start work on a new station building at Burnham and refurbishment of the ticket office and station building at Taplow – the latter complementing our step-free works that were completed in December 2019.

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	997	1,149	1,006	0	29

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

Central operating section

Post completion of a construction blockade, which involves suspending dynamic testing to complete infrastructure works, and testing of a new lineside signalling software version with Class 345 trains began in the central section in September. This will continue through to December 2020.

Reading and Heathrow

In Quarter 2, nine-car Class 345 services to Heathrow, using the European ETCS signalling system, stepped up to two trains per hour. Seven-car trains continued to operate on services to Reading, pending delivery of new software configuration to improve nine-car fleet reliability in Quarter 3.

Stratford to Shenfield

Seven-car Class 345 trains continue to operate on this service and will continue to do so until Stage 4a is introduced in H1 2021/22 when they will be replaced with nine-car Class 345 trains.

From 14 September 2020, TfL Rail services between Paddington and Heathrow have been operated entirely by the Class 345 Elizabeth line trains. The units inherited from the previous Heathrow Connect service have been withdrawn with customers benefiting from longer and more spacious trains, with full air conditioning and modern customer information.

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	*	17.6	*	*	*

*This information is withheld for reasons of commercial sensitivity.

On 1 October 2020, the responsibility for the Crossrail project moved to sit directly with TfL. This is to ensure decision making is seamless and fully aligned during the critical final phases of the programme, as the operational testing is done, and the remaining parts of the railway are completed and transferred to our operational teams.

Crossrail continues to work on a plan to drive the project to completion and the initial proposal indicates the central section of the Elizabeth line opening during the first half of 2022. The proposal is not a confirmed opening window and remains subject to review and validation.

Health and safety remain our top priority and overall performance is kept under constant scrutiny, especially now that a consistent number of operatives have remobilised to site after the coronavirus Safe Stop.

The routeway construction blockade has been successfully completed, with a high level of productivity achieved and a major programme of works delivered across 42km of the central section routeway by the supply chain. The blockade achieved 96 per cent productivity against plan and the tunnels are now in a physical position to support trial running.

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. Programme impact and mitigations are also detailed.

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 ■
Piccadilly Line Upgrade programme ■			
One-person operation CCTV (design and build) approved by TfL for contract award	14 July 2020	14 July 2020	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 ■
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 ■

Milestone description	Plan date	Actual/ forecast date	Status
Barking Riverside Extension ■			
Completion of Thames Water works to divert sludge main at Pier 14	23 July 2020	12 August 20	Complete ■

Cadent Gas site attendance delays. Traffic management delay on the first day of the works and slower progress due to safety restriction measures.

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.

London Underground			
Stations renewals and enhancements ■			
Track Renewal – 52-hour possession on the Piccadilly line to re-rail track between Heathrow Terminals 1,2 & 3 and Hatton Cross on the eastbound tunnel	6 July 2020	6 July 2020	Complete ■
Stations - Restart of construction activities at twelve 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 ■

Air quality ■			
Congestion Charge changes go live	22 June 2020	18 June 2020	Complete ■
Assets ■			
Victoria Coach Station infrastructure: Complete Fire System works on site	17 October 2020	22 September 2020	Complete ■
Public transport ■			
Reeves Corner: Embedded rail track renewal. Section 1 complete	14 September 2020	31 August 2020	Complete ■