

Transport for London investment programme report

Quarter 1 2019/20

MAYOR OF LONDON



**TRANSPORT
FOR LONDON**
EVERY JOURNEY MATTERS

About Transport for London (TfL)

Part of the Greater London Authority family led by Mayor of London Sadiq Khan, we are the integrated transport authority responsible for delivering the Mayor's aims for transport.

We have a key role in shaping what life is like in London, helping to realise the Mayor's vision for a 'City for All Londoners'. We are committed to creating a fairer, greener, healthier and more prosperous city. The Mayor's Transport Strategy sets a target for 80 per cent of all journeys to be made on foot, by cycle or using public transport by 2041. To make this a reality, we prioritise health and the quality of people's experience in everything we do.

We manage the city's red route strategic roads and, through collaboration with the London boroughs, can help shape the character of all London's streets. These are the places where Londoners travel, work, shop and socialise. Making them places for people to walk, cycle and spend time will reduce car dependency and improve air quality, revitalise town centres, boost businesses and connect communities.

We run most of London's public transport services, including the London Underground, London Buses, the DLR, London Overground, TfL Rail, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the Emirates Air Line. The quality and accessibility of these services is fundamental to Londoners' quality of life. By improving and expanding public transport, we can make people's lives easier and increase the appeal of sustainable travel over private car use.

We are moving ahead with many of London's most significant infrastructure projects, using transport to unlock growth. We are working with partners on major projects like Crossrail 2 and the Bakerloo Line Extension that will deliver the new homes and jobs London and the UK need. We are in the final phases of completing the Elizabeth line which, when open, will add 10 per cent to central London's rail capacity.

Supporting the delivery of high-density, mixed-use developments that are planned around active and sustainable travel will ensure that London's growth is good growth. We also use our own land to provide thousands of new affordable homes and our own supply chain creates tens of thousands of jobs and apprenticeships across the country.

We are committed to being an employer that is fully representative of the community we serve, where everyone can realise their potential. Our aim is to be a fully inclusive employer, valuing and celebrating the diversity of our workforce to improve services for all Londoners.

We are constantly working to improve the city for everyone. This means freezing TfL fares so everyone can afford to use public transport, using data and technology to make services intuitive and easy to use, and doing all we can to make streets and transport services accessible to all. We reinvest every penny of our income to continually improve transport networks for the people who use them every day.

None of this would be possible without the support of boroughs, communities and other partners who we work with to improve our services. We all need to pull together to deliver the Mayor's Transport Strategy; by doing so we can create a better city as London grows.

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Please note that safety and sustainability information will no longer be referenced in this report. There is a quarterly Safety, Sustainability and Human Resources Report published on our website, which provides an overview of health, safety and environmental performance for London Underground, TfL Rail, Surface Transport and Crossrail services.

Introduction

This investment programme quarterly performance report provides an update on a range of projects that will create world-class transport services in London.

The 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 sub-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 any notable progress made after quarter end.

For a sub-programme and 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 for annual portfolios where spend to date, authority and EFC figures represent the current financial year. 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 across TfL, the reporting of Estimated Final Costs for projects is based on the current risk profile and opportunity realisation at the time of publication. As a result, project EFCs could fluctuate every quarter, however this does not automatically mean that there is an increase in spend authority.

The EFC of each sub-programme or project may display a red, amber or green (RAG) status, which represents the level of change in EFC from the previous quarter, such as:

EFC increase of two per cent or more:



EFC increase of five per cent or more:



EFC decrease of two per cent or more:



EFC decrease of five per cent or more:



Where no symbol is used, the EFC increase or decrease (if any) is less than two per cent.

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. In addition to the committed projects and programmes included in this report, we will be seeking to obtain capital spend authority for schemes such as the Bakerloo Line Extension and Crossrail 2.

Each sub-programme or project also has an overall RAG milestone status, which represents the average forecast date variance against plan for 2019/20 strategic milestones:

On time or early:



1-89 days late:



90 or more days late:



N/A (without 2019/20 strategic milestones):





Cycleway route by Rodney Road in Southwark

Strategic milestones for 2019/20 – the key milestones listed in the TfL Budget – are detailed in the Appendix (page 86).

Our investment programme is delivered by the following areas of the business: Major Projects, London Underground, Surface and Other and the report structure reflects this.

- Major Projects is responsible for our largest and most complex projects. It comprises line upgrades, the Piccadilly line upgrade, network extensions, and major stations, which are covered in pages 18-35 of this report. Future Projects (see page 37) will be reported in detail following financial authority approval
- London Underground comprises stations, accessibility, track renewals, power, cooling and energy, rolling stock renewals, and signalling and control, which are covered in pages 38-49
- Surface Transport comprises Healthy Streets, air quality and environment, public transport, and asset investment. These are covered in pages 50-73
- Other comprises technology and data, TfL Growth Fund, and the Elizabeth line (including Crossrail), which are covered in pages 74-85

Tragic incident at Waterloo

On the morning of Wednesday 18 September 2019 Christian Tuvi, a contractor, tragically died at London Waterloo Underground station. An immediate and urgent investigation is being carried out by the Office of Rail and Road into the circumstances of this terrible incident. It is absolutely critical that we understand how this happened and how we ensure that it never happens again.

Mayor's Transport Strategy

The Mayor's Transport Strategy sets out a bold vision for a growing, welcoming London, where 80 per cent of journeys will be made by walking, cycling or public transport by 2041.

We are increasing services as needed on existing lines and routes and are in the final phase of completing the Elizabeth line. We are also making

streets healthy, pleasant and productive places to stop at, travel through and live. Listening to, and acting on, the suggestions of our users and customers will allow us to make walking, cycling and public transport the first choice for the vast majority of trips, and everyday operational excellence will unlock the new jobs and homes that our city needs.

This report looks at our investment programme in respect of the following themes from the Mayor's Transport Strategy:

Healthy Streets and healthy people



A good public transport experience



New homes and jobs

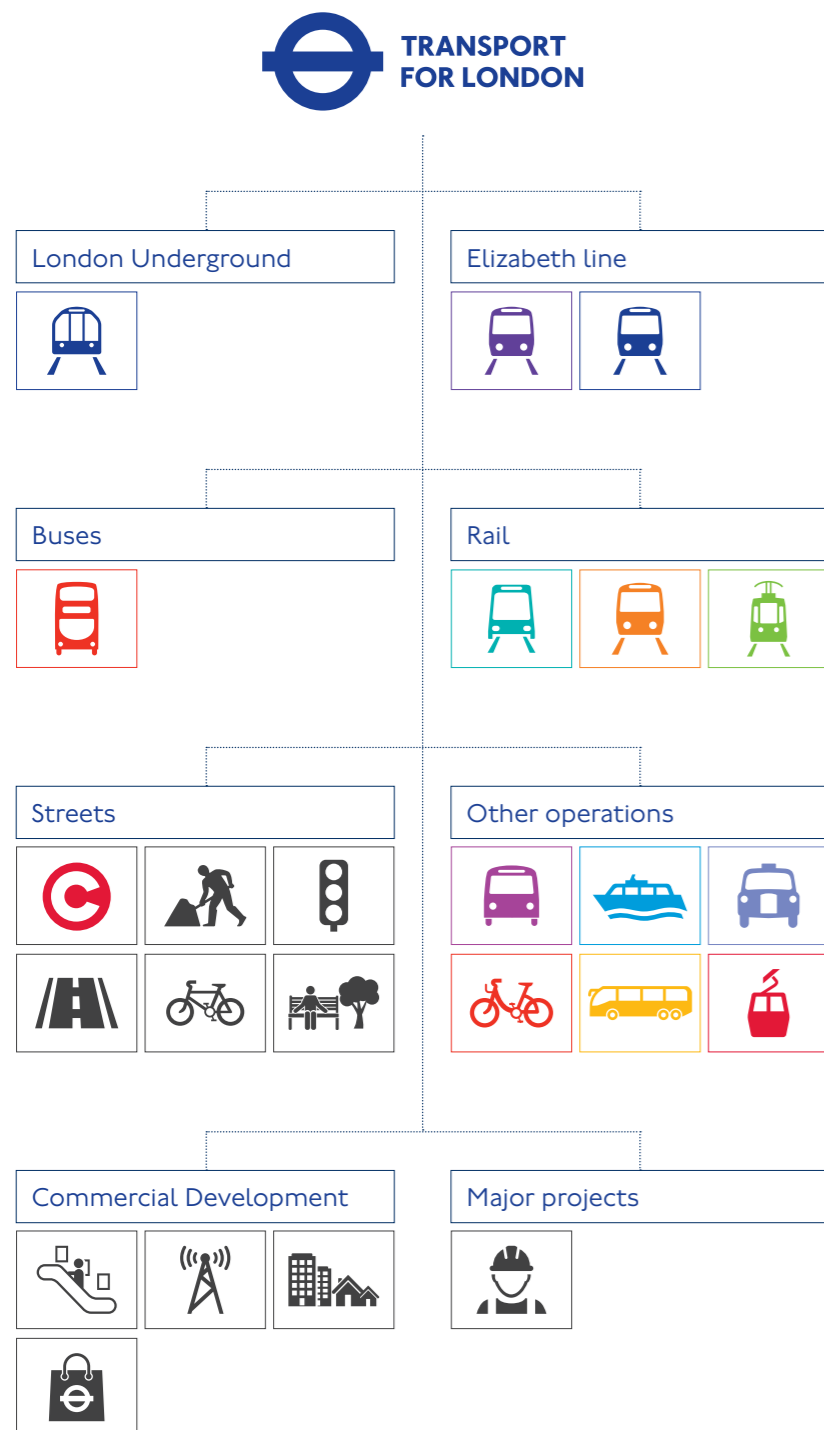


BYD electric double decker bus in service on Oxford Street

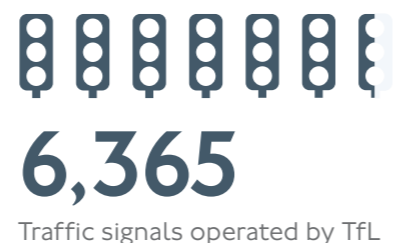
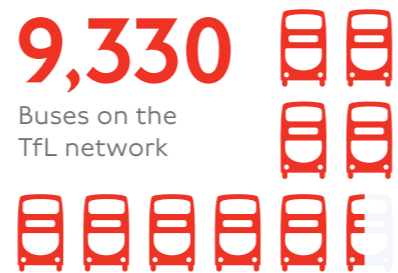
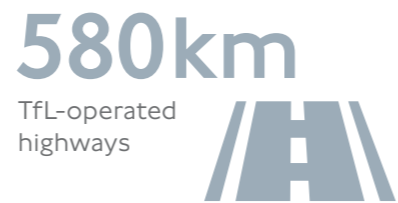
Business at a glance

Keeping London moving, working and growing to make life in our city better

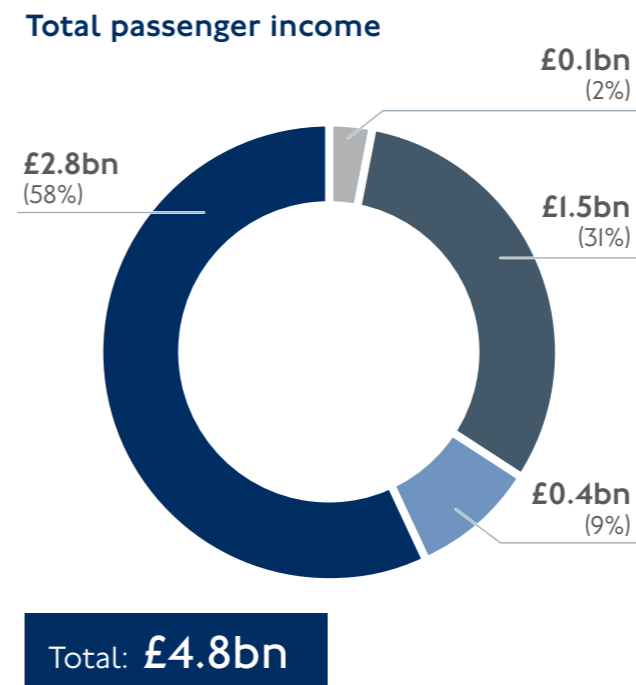
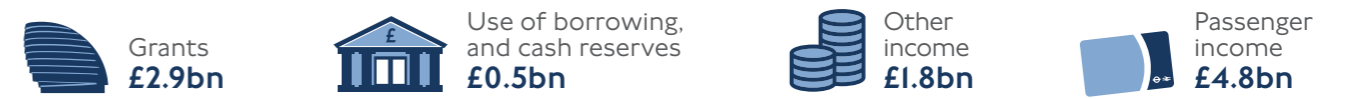
How we report on our business



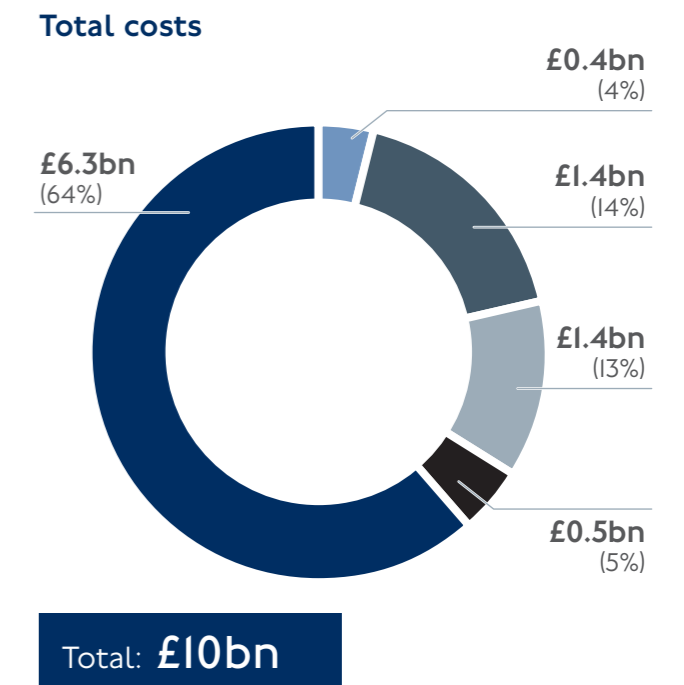
Facts and figures*



Finances at a glance*



■ London Underground
■ Rail ■ Buses ■ TfL Rail



■ Operating cost ■ New capital investment
■ Capital renewals ■ Crossrail ■ Net financing

* Based on full year 2018/19

Key achievements

Line upgrades

On the Four Lines Modernisation programme, all the S-stock fleet – comprising 59 S8 (eight-car) trains for the Metropolitan line and I33 S7 (seven-car) trains for the Circle, District and Hammersmith & City lines – have now been fitted with automatic train control equipment to support communications-based train control (CBTC). This work has been completed ahead of, and in readiness for, commissioning the ATC system in the remaining signalling areas of the sub-surface railway network.

Separately, on Capacity Optimisation (RSE), we have completed speed improvement and track works to the Northern line and continue power enhancement works with Balfour Beatty.

Network extensions

In June, track was installed which has allowed engineering trains to travel end to end through the 3.2km Northern Line Extension (NLE) to Battersea for the first time.

The NLE project won gold for the Battersea and Kennington sites and silver for Nine Elms at the Considerate Constructors Scheme National Site Awards. NLE was also awarded the Royal Society for the Prevention of Accidents GOLD for the third consecutive year.

Station enhancements

The concept design for Colindale station is now complete and the next phase will be to procure detailed design. Full planning consent for the new entrance, along with outline consent for the adjacent residential developments, was granted in July 2019. The project will bring significant improvements, including a spacious new entrance, a new lift providing step-free access to the platforms as well as new homes around the station.

We have now completed the new South Bank station entrance at Waterloo with three new escalators (including one to replace the previous fixed staircase) and associated back of house systems and other facilities now all in service. The entrance was formally opened in May 2019.

Track renewals

We have replaced more than 1.6km of ballasted track, which included renewal on the District, Bakerloo and Central lines. We have also replaced more than 600 metres of drainage in this quarter.

Rolling stock

On the Jubilee line, 52 out of 63 trains have been refurbished and are back in service. The refurbishments include a wheelchair area, new flooring, refreshed interiors (including grab-poles and handles), as well as new sealing to the roof and windows. We have now started to apply the new priority seating moquette.



Gospel Oak to Barking line



Ardleigh Green Bridge

Highbury Corner

The footway paving and kerbing were completed at the beginning of June following the traffic switchover to two-way operation which took place over the Easter weekend. The main highway and urban realm work is now complete; the road network is reconfigured and the gyratory at Highbury Corner removed. The Mayor Sadiq Khan visited the site on 2 October.

Walking and cycling

In May 2019, the length of protected cycle infrastructure surpassed the 2016 baseline of 53km, with 112km complete or under construction. This includes pedestrian and cycle improvements between Acton and Wood Lane along the A40 (which started construction on 18 March). Recently completed schemes include new pedestrian and cycle crossings at Edgware Road and a route connecting Kensington High Street and Notting Hill. We have also introduced new pedestrian and cycle crossings across Euston Road at Judd Street and new segregated cycle lanes on Midland Road as part of Cycleway 6. This means we now have a cycle route all the way between Elephant and Castle and Kentish Town.

Borough Local Implementation Plan projects

Construction of schemes at Baker Street, Beddington, Feltham, Hayes town centre, Stratford gyratory and Tottenham Court Road (West End project) are currently complete or under construction.

Fleet compliance

Post quarter achievement, we introduced 10 Low Emission Bus Zones, with significantly lower NOx emissions in August.

Asset investment

At Ardleigh Green Bridge all construction works to replace the bridge are now complete.

Public transport

After the end of the quarter, in August, works at White Hart Lane station were completed. There are new station entrances and a more accessible station which included step-free access from the street to the platform for the first time. The design of the new station has been carefully planned to provide quicker and easier access for commuters.

The Gospel Oak to Barking line is now exclusively operated by new four-car electric air-conditioned trains, doubling capacity, restoring a 15 minute frequency and bringing greater reliability to the service. To celebrate this milestone, and to thank customers for their patience during the delay bringing the new trains into service, we offered customers a month of free travel on the line in September. This was in place from Saturday 31 August to Tuesday 1 October inclusive.

2019/20 Strategic milestone performance summary

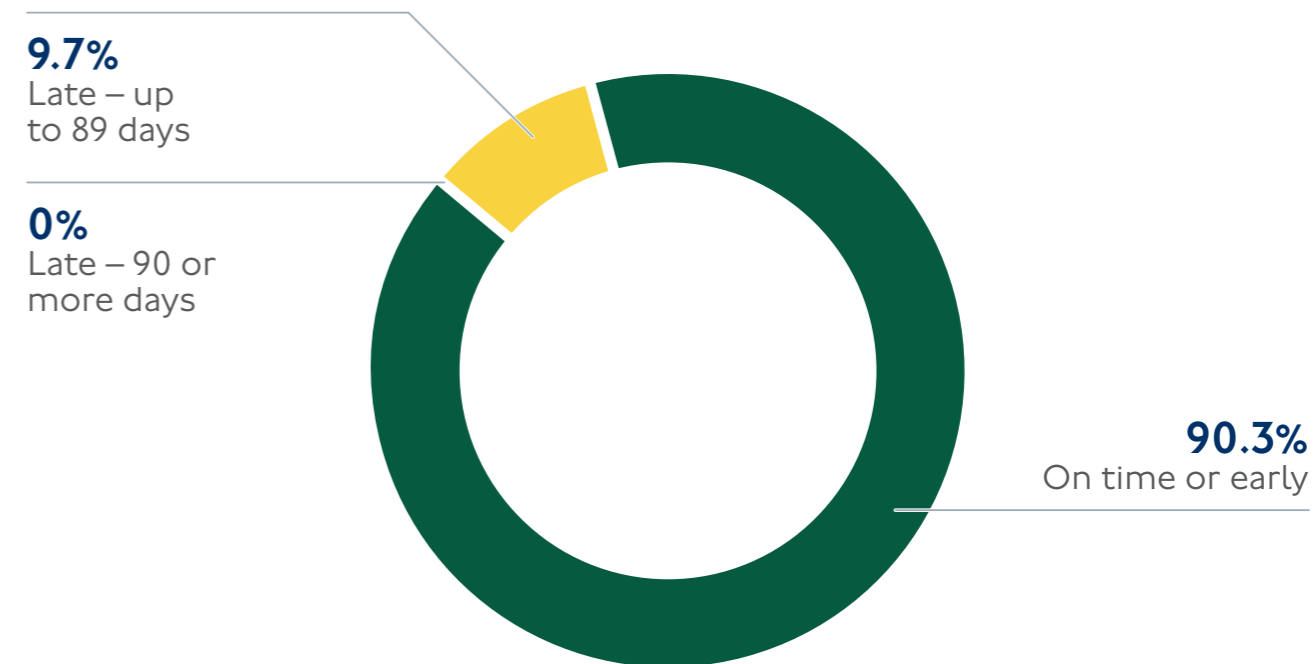
On London Trams, following the switch to cashless trams in July 2018, the existing ticket machines, which date back to the opening of the system, have now been removed from all but three tram stops, the remainder will be removed during November 2019.

Tram track renewals between Addiscombe Road and Blackhorse Lane have successfully been delivered.

Other

The 4G Pilot project on London Underground is now established and we have signed a contract with Capita and their partners, Nokia and Installation Technology, for the delivery and service management of the solution. The scope of the 4G Pilot will cover station areas, platforms and tunnels of the Jubilee line between Westminster and Canning Town.

The overall performance for all TfL 2019/20 strategic milestones is summarised as follows:



The late milestones are shown in the Appendix, on page 82.

Major projects

Line upgrades 

Four Lines Modernisation

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2023	4,728	5,412

2019/20 strategic milestone RAG

We have already introduced 192 new S-stock trains on the Circle, District, Hammersmith & City and Metropolitan lines.

The first section of the new signalling system was successfully introduced earlier this year, and is now operating between Hammersmith and Euston Square and up to Finchley Road on the Metropolitan line. We have continued to improve the reliability of the system in this area and these improvements made will be rolled out as the remaining signalling areas are commissioned.

All the S-stock fleet – comprising 59 S8 (eight-car) trains for the Metropolitan line and 133 S7 (seven-car) trains for the Circle, District, Hammersmith and City lines – have now been fitted with automatic train control equipment to support communications-based train control (CBTC). This work has been completed ahead of, and in readiness for, commissioning the ATC system in the remaining signalling areas of the sub-surface railway network.

Commissioning of the final signalling area between Rayners Lane and Uxbridge remains on schedule to support the final service frequency increases in 2023.

EFC (£m)	EFC movement post plan (£m)
5,301	(34)

In Quarter 4, a review of the programme schedule and EFC was undertaken, focusing on assurances over key forecast assumptions and risk exposure, supported by an extensive senior management review. The outcome of this review led to an EFC increase of £34m over the 2018 Business Plan. Work continues on analysing the expected EFC, to deliver programme benefits ahead of schedule.

The EFC remains at £5,301m this quarter, £111m under authority. The £111m reduction to date has been achieved by a previous schedule aimed at delivering the benefits ahead of the authority milestone dates, value engineering solutions, innovation, and providing the optimum scope to bring about the planned benefits.

Due to the complexities of this programme delivery and ongoing access requirements, there is a continuous analysis of the outturn costs which are expected to impact the EFC. The impact on the EFC is expected to remain within authority. The EFC is currently undergoing extensive senior management review.



S-Stock under ATO operation as part of Four Lines Modernisation at Goldhawk Road

Assurance

The Project Assurance Team completed a project assurance review on the Four Lines Modernisation programme submission to the Programmes and Investment Committee meeting in October 2018. A quarterly update was provided to the Committee on 17 July 2019 on the 15 recommendations that were made and accepted, including 11 by the Independent Investment Programme Advisory Group (IIPAG). Six recommendations are closed and good progress is being made to close the remaining nine. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.



Capacity Optimisation - Railway System Enhancements (formerly World Class Capacity)

Forecast completion year

2024

Spend to date (£m)

114

Spend authority (£m)

245

EFC (£m)

205

EFC movement post plan (£m)

2

2019/20 strategic milestone RAG



This programme includes upgrades to signalling, power, trains and track to maximise capacity on the Jubilee and Northern lines with the existing train fleets. While many of the works are stand-alone, a significant proportion is essential to other programmes, including further upgrades to the Jubilee line and the opening of the Northern Line Extension, as well as the reconfiguration of 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 power enhancement works with Balfour Beatty.

Enhancements to the Jubilee line continue, and include improving the speed at which trains exit the depot onto the mainline at Neasden.

Assurance

The Project Assurance Team completed a project assurance review on the Railway System Enhancements programme submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 17 July 2019 on the six recommendations that were made and accepted, including three by IIPAG. All recommendations are now closed.

EFC has reduced by £2m through efficiencies as a result of a change in the delivery approach for the wheel lathe at Morden depot.



Capacity optimisation - DLR Rolling Stock and System Integration

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
2025	17	603	603	*

2019/20 strategic milestone RAG



New DLR trains and infrastructure are vital to support the ongoing regeneration of east London, including housing growth and business opportunities.

The programme will replace the 60 per cent of the existing DLR fleet that is nearing the end of its design life and provide additional trains, which will increase capacity to meet the projected housing and employment growth in the Docklands area. The depot at Beckton will be extended, with further sidings for the new trains, a new maintenance facility and an extended automatic train operation test track. The Thales automatic train operation signalling system also needs updating and the traction power system needs to be strengthened.

Following an extensive period of review and negotiation, a contract for the supply of the next generation of DLR trains was awarded to Construcciones y Auxiliar de Ferrocarriles (CAF) of Spain in June 2019.

Beckton depot concept design has been accepted and a detailed design contract let for the enabling works and sidings design. The main works are due to commence in October 2019.

Key stakeholder activity includes close working with KeolisAmey Docklands, which operates the DLR, and plays a fundamental role in bringing the new trains and facilities into service.

Assurance

The Project Assurance Team completed a project assurance review on the DLR Rolling Stock Replacement programme submission to the Programmes and Investment Committee meeting in December 2018. A quarterly update was provided to the Committee on 17 July 2019 on the five recommendations that were made and accepted, including three by IIPAG. One recommendation is closed and good progress is being made to close the remaining four. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.



Piccadilly line upgrade – rolling stock and enabling (formerly Deep Tube Upgrade Programme)

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
2030/31	122	3,294	3,111	(2)

2019/20 strategic milestone RAG



The Piccadilly Line Upgrade programme is designed to deliver a fleet of newly designed, high-capacity, walk-through, air-cooled trains to replace some of the oldest on our network along with a proposed new signalling system. The initial focus is on the introduction of new trains.

We are on track to complete the associated milestone for train concept design ahead of the January 2020 target. This concept stage is carried out to ensure that requirements have been understood. The successful completion of the concept design allows later design stages to be finalised before beginning the manufacture and testing stages.

The trains are being designed to current British and European standards for EMC levels that some of our legacy signalling assets do not comply with.

Tender evaluation training and briefings were held and preparations are being finalised in anticipation of bids being returned for the new CCTV system for the Piccadilly line. The system will allow train operators to ensure safe departure of the new train from the platform. We aim to award the CCTV contract in Quarter 3 of 2019/20.

EFC (£m)	EFC movement post plan (£m)
3,111	(2)

The EFC and spend authority relates to works and enabling associated with the introduction of the Piccadilly line rolling stock.

* This information is withheld for reasons of commercial sensitivity.



Computer generated image of the new Piccadilly line rolling stock

Assurance

The Project Assurance Team completed a project assurance review on the Piccadilly Line Upgrade programme submission to the Programmes and Investment Committee meeting in May 2018. A quarterly update was provided to the Committee on 17 July 2019 on the 10 recommendations that were made and accepted, including five by IIPAG. All recommendations are now closed. The Project Assurance team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Network extensions

Northern Line Extension

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
2021**	790	*	*	*

2019/20 strategic milestone RAG On Track

The Northern Line Extension (NLE) is a twin-tunnelled extension from Kennington to a new terminus at Battersea Power Station, via a new station at Nine Elms. This supports the regeneration of the Vauxhall Nine Elms Battersea Opportunity Area.

All running rail has been installed which has allowed engineering trains to travel end to end through the 3.2km Northern Line Extension to Battersea for the first time on 14 June. Using engineering trains, we have delivered and installed circa 6km of 22kv high voltage cable in the tunnels.

Going forward, the main focus is the fit-out of the new stations, installing the power supply, and extending the signalling used on the existing line to the extension.

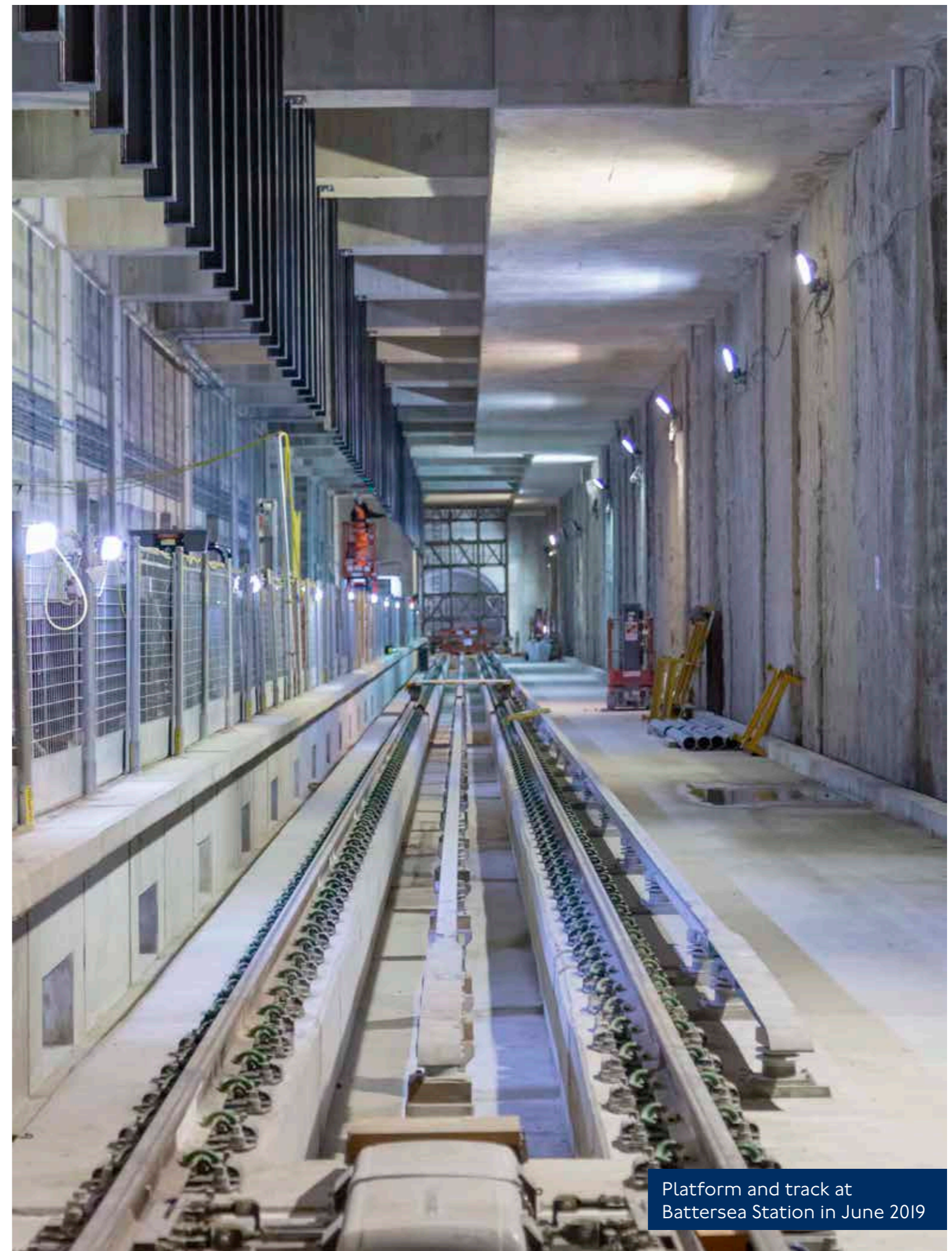
At Battersea station, we handed back land, adjacent to the northern worksite boundary, to the Battersea Power Station

Development Company on 3 June 2019. Blockwork is nearing completion and we have commenced applying the finishes. The last architectural soffit panel has been installed, completing the ticket hall ceiling. The diamond track crossover, which enables trains to select between the northbound and southbound platforms and tunnels, has been installed.

At Nine Elms station, we have installed the pre-cast lift shaft walls in the western superstructure and poured the final concrete slab for the roof of the station. Blockwork is nearing completion and we have commenced applying the finishes.

* This information is withheld for reasons of commercial sensitivity

** Following a review of the remaining works on the Northern Line Extension, the opening date is now scheduled for autumn 2021 with a target of September. The opening of the extension continues to align with the wider regeneration of the Vauxhall Nine Elms Battersea Opportunity area and will ensure we will be operating Northern line services on the extension when demand for the line is there.



Platform and track at Battersea Station in June 2019

The installation of a modular cable management system in the basement service corridors continues. The station public address and voice alarm system have passed factory acceptance testing. The system will provide an essential method for communicating critical information to both staff and customers at the new stations.

The construction of the external structures for head houses at Kennington Park and Kennington Green is complete. Work will now commence on making the structures watertight, construction of the internal walls and fitting the architectural cladding.

We won gold for the Battersea and Kennington sites and silver for Nine Elms at the Considerate Constructors Scheme National Site Awards. NLE was also awarded the Royal Society for the Prevention of Accidents Gold for the third consecutive year.

Assurance

The Project Assurance Team completed a project assurance review on the Northern Line Extension programme submission to the Programmes and Investment Committee meeting in December 2018. A quarterly update was provided to the Committee on 17 July 2019 on the 10 recommendations that were made and accepted, including six by IIPAG. Four recommendations are closed and good progress is being made to close the remaining six. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.



Silvertown Tunnel

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
2025	55	*	*	*

2019/20 strategic milestone RAG**

The Silvertown Tunnel will tackle traffic congestion at the Blackwall Tunnel and the consequential effects this has on travel, the environment, the economy and growth across the wider east and southeast London area.

The tunnel will connect Silvertown and the Greenwich Peninsula, which are areas being developed by third parties with numerous tenants and landowners. The new twin-bore tunnel, within the extended Ultra Low Emission Zone (ULEZ), will effectively eliminate congestion and the problem of 'standstill' traffic to deliver an overall improvement in air quality and provide several new cross-river bus routes in east London which are expected to be zero-emission from launch.

Following an extensive tender process, in May 2019 the Riverlinx consortium was nominated as the preferred bidder to complete detailed design and to build the Silvertown Tunnel. Since then we have received a legal challenge to this decision by the reserve bidder which automatically suspends our right to award the contract to Riverlinx. We have now received the particulars of the claim and have submitted our defence. We

are also in the process of submitting an application to lift this automatic suspension so we can award the contract and begin construction on this vitally important project as soon as possible.

The project will be procured through a Design, Build, Finance and Maintain contract. Throughout the summer, Riverlinx has worked to confirm financial arrangements with lenders in respect of the project and to set up the supply chain.

Pre-build activities to facilitate a smooth start to construction, once the contract is awarded, have continued. This includes the design for enabling works packages following completion of concept designs for the replacement North Greenwich car parks last year. We continued monitoring existing structures in the area before the main tunnelling works commenced, and began noise monitoring ahead of the start of construction.

* This information is withheld for reasons of commercial sensitivity.

** Due to the legal challenge, the forecast date for the contract award is now 14 November.

We are working with utilities companies to agree how to progress early investigation and service diversions. We have been establishing third-party agreements with these companies and are negotiating land access. We have also been developing our consent obligations and finalised the agreement with the Royal Borough of Greenwich to ensure benefits of the tunnel are maximised and the area around the tunnel is enhanced.

Assurance

The Project Assurance Team completed a project assurance review on the Silvertown Tunnel programme submission to the Programmes and Investment Committee meeting in May 2019. A quarterly update was provided to the Committee on 17 July 2019 on the seven recommendations that were made and accepted, including two by IIPAG. Four recommendations are closed and good progress is being made to close the remaining three. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.



Barking Riverside extension

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
2022	54	287	286	*

2019/20 strategic milestone RAG

We are delivering a new rail link to serve the 10,800 new homes that are planned for the Barking Riverside development area. We will build a spur from the Tilbury Loop line east of Barking, to extend our service to Barking Riverside. Train services are planned to start in 2021.

Early overhead line equipment works were procured separately and completed over Christmas 2018, to enable subsequent possessions of Network Rail infrastructure by the main works contractor.

Planning permissions have now been granted for the Barking Riverside station and viaduct structure. Monitoring equipment has been installed ahead of piling in close proximity to the High Speed 1 tunnels planned for later this year. Preparations for the crucial Network Rail infrastructure blockade were completed on 4 August, where essential groundworks were undertaken.

Piling at the station is progressing well with 70 per cent completed. We have installed 600m of plain line and the first switch and crossing. We continue to work with stakeholders to secure the required network change approval from Network Rail. Unplanned utility services have been located where the piles for a pier

need to be installed. Investigations are being carried out to explore the feasibility of redesigning the pier structure to avoid diverting the services. The utility companies have advised service diversions could take in excess of one year which puts these activities on the critical path and pressure on the revenue into service date.

Assurance

The Project Assurance Team completed a project assurance review on the Barking Riverside Extension programme submission to the Programmes and Investment Committee meeting in December 2018. A quarterly update was provided to the Committee on 17 July 2019 on the seven recommendations that were made and accepted, none by IIPAG. Four recommendations are closed and good progress is being made to close the remaining three. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

* This information is withheld for reasons of commercial sensitivity.

Major stations

Victoria station upgrade and finishes

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2019	578	604

2019/20 strategic milestone RAG 

We have built a new north ticket hall and 300 metres of subways, and have increased the size of the south ticket hall by 50 per cent. Step-free access to all platforms is now in place. The station is used by 83 million people a year.

The new station has opened in stages with all passenger-facing facilities now in use. The Duke of York pub, which was closed so jet grouting works for the tunnels could be carried out, has now been returned to the possession of the freeholder. The site cabins have been removed and the area of Terminus Place, the taxi rank and the Network Rail site areas have now been reinstated.

The overall completion of the station and the surrounding buildings is largely complete with minor works outstanding on the District and Circle line platforms and I75-I79 Victoria Street.

EFC (£m)	EFC movement post plan (£m)
584	(3)

The EFC has increased by £3m since the 2018 Business Plan to reflect the prolongation of the programme to complete works and final account settlements. The EFC remains £20m below authority.



Bank station upgrade

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2022	439	656

2019/20 strategic milestone RAG 

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 to reduce customer journey times.

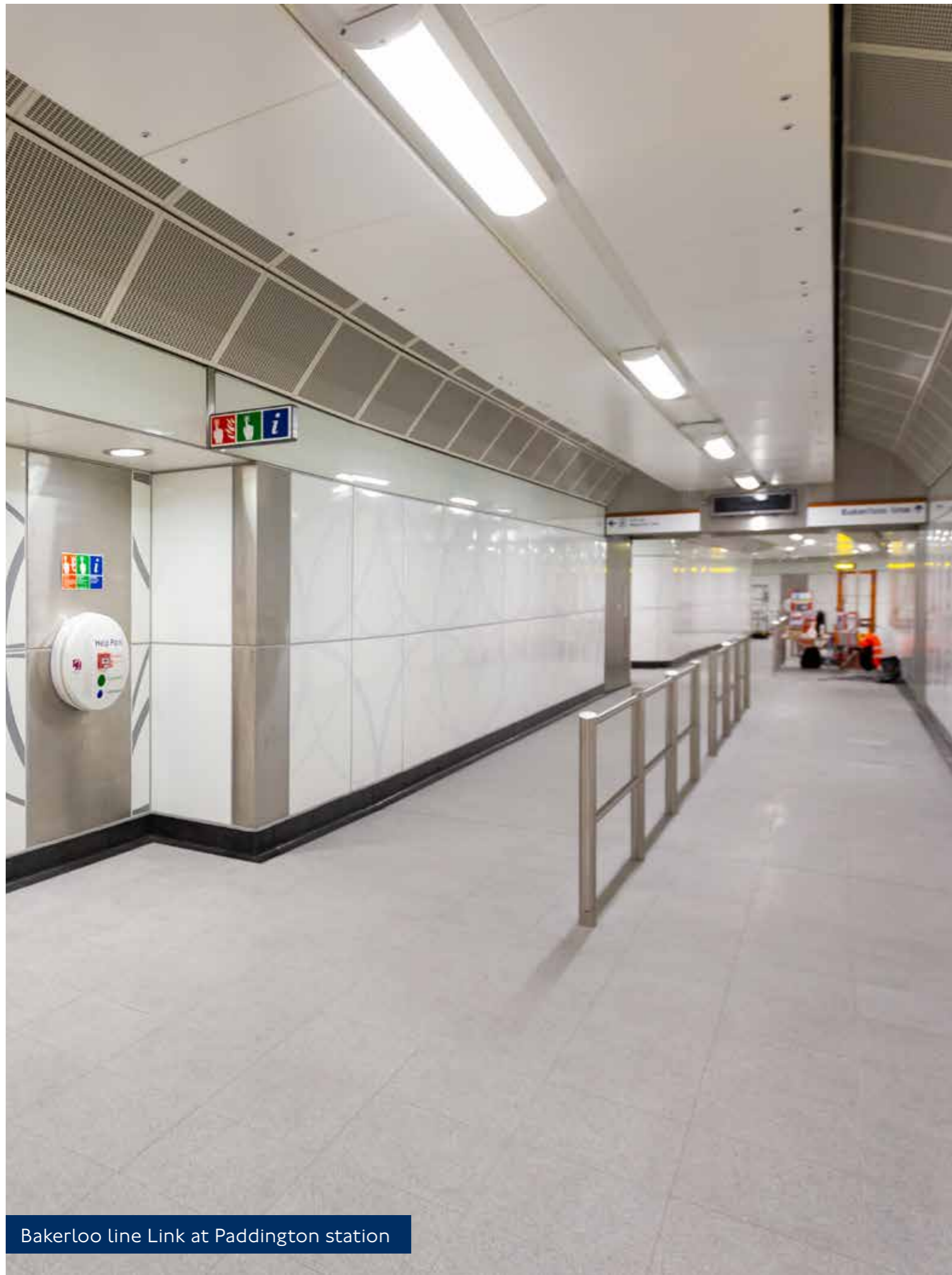
The modernisation of Bank station reached a landmark with over half of the construction work now complete. The new tunnel has been excavated, with waterproofing and concrete lining now underway. The escalator barrel from the new entrance on Cannon Street to the Northern line platforms is complete and another that will form a new escalator to the Central line is nearing completion.

A major milestone was reached in late summer, with the roof on the new station entrance completed, located on Cannon Street. Work will now continue to fit out the entrance, with the next stage focused on creating the dividing walls and operational rooms within the new station entrance, which is spread across 11 floors.

The new station on Cannon Street is beginning to take shape. The structure for the new station was completed this summer, allowing interior wall construction and station fit out to start in the autumn. The cross passages to the new Northern line tunnel are underway. The new tunnel will be connected to the existing Northern line in 2021.

EFC (£m)	EFC movement post plan (£m)
664	(8)

The EFC has increased by £8m in the last quarter as a result of a changed risk profile and additional scope items required to deliver the upgrade safely. Risk mitigation reviews are continuing to be held each period to identify opportunities to reduce the current EFC. We continue to work collaboratively with the main contractor to identify and realise potential savings with a view to reduce the EFC back to the Business Plan level or below.



Bakerloo line Link at Paddington station



Bakerloo line link

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2019	74	76

2019/20 strategic milestone RAG



A new step-free pedestrian walkway at Paddington has been constructed to link the Bakerloo line platforms with the new Elizabeth line station.

The new pedestrian walkway will provide step-free access from the Bakerloo line to the new Paddington Elizabeth line station. Two new escalators and a new lift have been installed. On 30 November 2018, the project completed the testing and commissioning works, which enabled the Bakerloo line link tunnel to be ready for trial running and integration with the Elizabeth line.

The final integration testing identified a small number of issues that needed to be addressed. These were completed in July 2019.

EFC (£m)	EFC movement post plan (£m)
75	(6)

The EFC remains static in the quarter and reflects the final account settlement with the main contractor.

The EFC has increased by £6m since the 2018 Business Plan as a result of reaching a settlement agreement as part of the final accounts. This cost was provided for within the 2018 Business Plan (but outside the programme).



Regents Park on the Bakerloo line

Future projects

We continue to develop major projects – currently at an early stage – that will deliver the new homes and jobs that London and the UK need.

In addition to already committed schemes, a number of major projects are in planning phases and dependent on future funding certainty, including Crossrail 2 and the Bakerloo Line Extension.

The Crossrail 2 team have been finalising the Strategic Outline Business Case (SOBC) which comprises five cases: strategic, economic, financial, management and commercial. They reflect lessons learnt from Crossrail 1. This was submitted to Government in June and details the development of Crossrail 2 to date and the options explored to deliver the greatest benefits and the most affordable scheme. It charts the connectivity benefits and economic impact for the rest of the country. The SOBC will now be reviewed by a number of different expert groups over the coming months including the Independent Assurance Panel, our Programmes and Investment Committee, the DfT's Business Investment Commercial Committee, the Infrastructure and Projects Authority's Project Assessment Review and, finally, HM Treasury's Major Projects Review Group.

We continue to develop our plans to deliver an extension and upgrade to the Bakerloo line to support development and regeneration in southeast London, including supporting at least 20,000 new homes in the Old Kent Road Opportunity Area, while also ensuring that our existing network is upgraded and modernised. We are working closely with Network Rail, GLA and the London Boroughs of Southwark and Lewisham, with a consultation in preparation to launch this Autumn. The consultation will seek views on new features of the extension proposals, including the proposed route of the tunnels and how we plan to construct those. We will also provide new proposals for a combined new Bakerloo and Northern line station entrance in Elephant and Castle. We have completed an assurance review which provided independent assurance of the project and are addressing the feedback received.

London Underground

Stations 

Forecast completion year

2023/24

Spend to date (£m)

2,042

Spend authority (£m)

3,218

2019/20 strategic milestone RAG



The targeted renewal of existing assets will improve safety, reliability and ambience, and maintain resilience. Station enhancements will reduce congestion and improve customer journey times.

Integrated stations programme

We have completed works on eight stations, (Barbican, Charing Cross, Ealing Broadway, Holland Park, Paddington, Sloane Square, Vauxhall and Whitechapel), including three that will interchange with the Elizabeth line.

Station enhancements

At Finsbury Park, work on the new western station entrance continues and we plan to open it in late 2019.

We have completed the concept design for the South Kensington station capacity upgrade project and we are working on the next stage in anticipation of commencing detailed design in 2020.

We will provide step-free access at Knightsbridge and build two new entrances on Brompton Road and Hooper's Court in partnership with a developer, who will enable and part-fund the works. The civil engineering works on the lift shaft to the platform were completed in June.

We continue the redevelopment and upgrade of Tottenham Hale station. The new station structure is in construction.

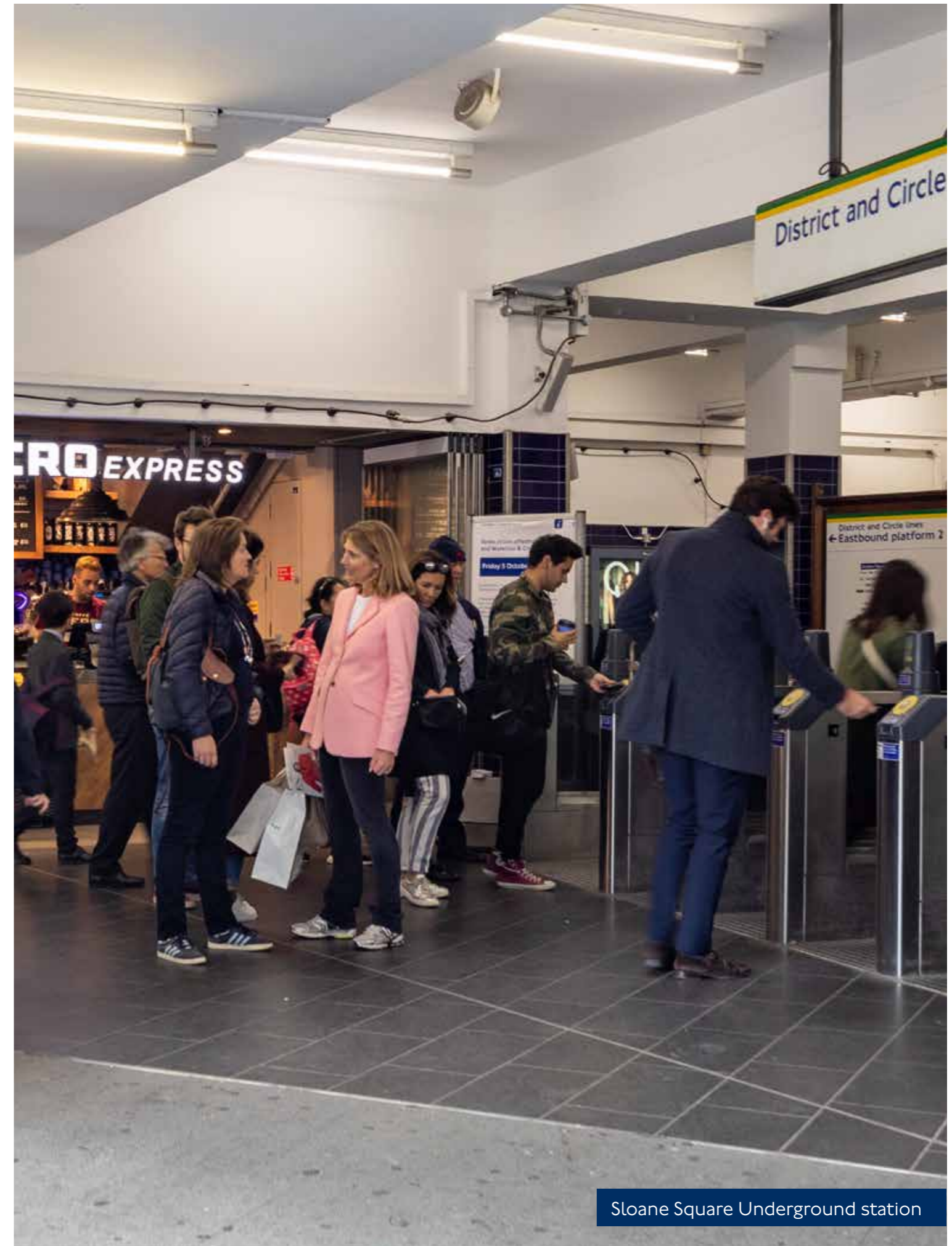
EFC (£m)

2,607

EFC movement post plan (£m)

0

The EFC, which covers all projects including those completed within the stations programme, has increased from £2,553m at Quarter 4 as a result of increased costs on developer-led projects including Crossrail and Stratford.



Sloane Square Underground station

Concept design for Colindale station is now complete and the next phase will be to procure detailed design. Full planning consent for the new entrance, along with outline consent for the adjacent residential developments, was granted in July 2019. The project will bring significant improvements, including a spacious new entrance, a new lift providing step-free access to the platforms and new homes around the station.

Developer funded works

We are working with Berkeley Homes to create a new western entrance to West Ham station, which will provide a direct route into the Jubilee line areas of the station from the development site. The developer's consultants have drafted the concept design specification documents and we are working with the developer to finalise agreements.

We have now completed the new South Bank station entrance at Waterloo with three new escalators (including one to replace the previous fixed staircase) and associated back of house systems and accommodation facilities now all in service. The entrance was formally opened in May 2019.

We are creating 11 retail units in the railway arches beneath Wood Lane station, where we continue to progress installation of core services.

Collaborative enhancements and third-party projects

In July, the London Borough of Southwark recommended that planning permission be granted for a new town centre at Elephant and Castle, subject to agreement and approval by the Greater London Authority and the Secretary of State. We continue to await final approval on the Section 106 agreement with the developer and the London Borough of Southwark. As part of the development, a new station box with connecting tunnels to the existing platforms will be built to increase capacity at the station and provide step-free access to the Northern line.

At Paddington, we are working with Great Western Developments to enable them to construct a new entrance to the Bakerloo line, with a much-enlarged ticket hall and step-free access to the platforms, as part of their redevelopment of adjacent buildings. We continue to collaborate with Great Western Developments and their consultants to confirm the scope, agree commercial terms and finalise a Works Agreement before starting the concept design phase.

At Stratford, we continue to work with stakeholders to consider access and capacity improvements. This includes working with the London Legacy

Development Corporation on reviving proposals for a new entrance and ticket hall to serve the Carpenters Road area, and on improvements to step-free access and capacity in the adjacent western subway.

Assurance

The Project Assurance Team completed a project assurance review on the Stations programme submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 17 July 2019 on the eight recommendations that were made and accepted, including three by IIPAG. All recommendations are now closed.

Accessibility



Forecast completion year

2023/24

Spend to date (£m)

42

Spend authority (£m)

244

2019/20 strategic milestone RAG



We are working on a wide programme of accessibility improvements, customer service and information enhancements across the Underground network. We will make over a third of stations accessible by 2020 by providing step-free access at a further 15 stations.

Fifteen stations will become step-free by spring 2020 as part of the Mayor's funding for step-free access. Having upgraded Newbury Park and Buckhurst Hill stations to provide step-free access in 2018, we delivered step-free access at South Woodford in March. We converted the existing steps to the westbound platform to create ramped access, modified the station layout to meet the new fire strategy and added an additional fire escape. We also upgraded the lighting system, installed improved signage and repaired the station building.

Design and build contracts are in place for a further 12 stations (Amersham, Burnt Oak, Cockfosters, Debden, Hanger Lane, Harrow-on-the-Hill, Ickenham, Mill Hill East, Northolt, Osterley, Sudbury Hill and Wimbledon Park). These include the construction of new lifts and overbridges, and other assets will be upgraded while we carry out these works. We have started work at a number of these stations which will continue for the rest of this year.

We have completed early stage designs for more step-free stations to be delivered in the mid-2020s.

EFC (£m)

151

EFC movement post plan (£m)

25

The EFC has decreased from £165m at Quarter 1 as there is reduced funding available in the 2018 Business Plan.

Track renewals



Forecast completion year

Annual

Spend to date (£m)

29

Spend authority (£m)

122

2019/20 strategic milestone RAG



We are replacing our ballasted and deep Tube track, points and crossings, and track drainage infrastructure to improve reliability, reduce maintenance costs and increase capacity.

We replaced more than 1.6km of ballasted track, which included renewal on the District, Bakerloo and Central lines. We also replaced more than 600 metres of drainage in this quarter. The Track Renewals programme is on target to achieve all key milestones.

On our deep Tube track network, we replaced more than 1.7km of an older track with modern flat bottom rails and renewed a further 0.9km of concreted deep Tube track.

Assurance

The Project Assurance Team completed a project assurance review on the Track Renewals programme submission to the Programmes and Investment Committee meeting on 17 July 2019. Five recommendations were made and accepted. Good progress is being made to close the recommendations. The Project Assurance Team tracks progress against the recommendations made as part of its continuous assurance.

EFC (£m)

132

EFC movement post plan (£m)

(9)

The EFC has increased by £9m since Quarter 4 to reflect the current delivery programme for 2019/20.

Power, cooling and energy

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
2023/24*	46	90	93	0

2019/20 strategic milestone RAG

Our renewals programme aims to improve safety, reliability and legal compliance of our power assets, introduce cooling in key locations to improve the customer experience and increase the energy efficiency of our assets.

Power

We continue to support the delivery of a number of third-party and major projects by providing power works, such as relocating the substation at Euston for High Speed 2, installing cable routes for the Northern Line Extension and works for the Piccadilly Line Upgrade, and the Bank Station Capacity Upgrade.

We are delivering a new portfolio of power renewal works to improve asset condition through a prioritised work bank of projects. Installation work on the first of these safety related projects has been completed with several others planned, and designs for the next priorities having obtained approval for procurement. The previous work bank of power renewals, operative since 2015, has reached the handover and close-out stage.

We are in the advance stages of procurement for a project to extend the life and address immediate obsolescence risk by consolidating three power control systems to a single system.

We are in the advance stages of procurement for a project to extend the life of and address immediate obsolescence risk by consolidating three power control systems to a single system. The system, once completed, will remotely monitor and safely operate traction, station, signalling and depot power supplies.

Cooling

In August we completed works at Bond Street station to provide improved airflow to the new Elizabeth line tunnel.

Energy

To install solar panels at the Acton workshop the roof would require remediation at a significant cost, so we have put this site on hold and are assessing the feasibility of installation at alternative sites, to meet the Mayor's solar energy commitment.

Assurance

The Project Assurance Team completed a project assurance review on the Power, Cooling and Energy programme submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 17 July 2019 on the 13 recommendations that were made and accepted, including eight by IIPAG. Ten recommendations are closed and good progress is being made to close the remaining three. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

* The figures represent power and energy projects until 2023/24 and authority is sought in stages for future unapproved works.

Rolling stock renewals

Forecast completion year

2029

Spend to date (£m)

203

Spend authority (£m)

602*

2019/20 strategic milestone RAG



We are modifying our passenger rolling stock to improve safety, accessibility, reliability and customer satisfaction, and reduce maintenance costs. We are also modifying or replacing some of our existing engineering vehicles that support track maintenance and infrastructure renewals.

We are carrying out improvements to ensure continued reliability of the Bakerloo line fleet. We have completed structural weld repairs to carriages on all 36 trains. We are refitting the vinyl of the first eight trains to make them consistent with later trains, and this will complete in autumn 2019.

On the Jubilee line, 52 out of 63 trains have been refurbished and are back in service. The refurbishments include a wheelchair area, new flooring, refreshed interior (including grab-poles and handles), and new sealing to the roof and windows. We have now started to install the new priority seating moquette.

On the Central line improvement programme, two carriages are being prototyped at the supplier's site with a further two carriages shipped for preparation. The new Train Management System has started dynamic testing on a second prototype train on LU premises. We continue to work with our supply chain on the enabling of the installation facilities for the improvement programme on the full fleet.

EFC (£m)

983▼▼

EFC movement post plan (£m)

(109)

The Quarter 4 EFC reported figure of £1,092m has reduced by £109m to £983m in Quarter 1. £105m of this decrease represents projects closed in 2018/19 not active in the current financial year and the remaining £4m is spread over various projects in the year.

Manufacture of the seven pre-production wagons in China has begun; these wagons will undergo testing in China before being shipped to the UK. Dynamic testing of these wagons will start in the UK early next year. Once the pre-productions wagons have been fully tested and approved, manufacture of the remaining 64 wagons will commence.

Stage 2 of the design and build tender for the mechanised deep tube renewal vehicle has commenced. When delivered this will improve the way track is renewed in the deep Tube sections of the London Underground network.

The two Kirow cranes and eight tilting wagons being procured to facilitate mechanisation of points and crossing renewals are undergoing final testing in Germany before being transported to the UK via rail later this year.

To ensure the infrastructure is ready to receive the engineering vehicles, Ruislip depot is undergoing infrastructure upgrades to facilitate stabling and loading of these vehicles.

Following an evaluation exercise, we have selected the option for replacing our track recording vehicle, which records and monitors the alignment and condition of the track, supporting track maintenance and renewal activities.

The construction of a new facility to support the Train Modification Unit based at Acton has progressed on site. Foundations are complete, structural steels are nearing completion and concrete pour of the slab sections has begun.

The project to provide train operators enhanced control over unauthorised entry into their cab from the saloon is progressing well – a prototype has been installed on a train and the contract award is on schedule.

Assurance

The Project Assurance Team completed a project assurance review on the Rolling Stock Renewals programme submission to the Programmes and Investment Committee meeting in March 2019. A quarterly update was provided to the Committee on 17 July 2019 on the 14 recommendations that were made and accepted, including 10 by IIPAG. Three recommendations are closed and good progress is being made to close the remaining 11. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

*The authority is lower than the EFC as authority is sought in stages.

Signalling and control

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
2023/24	76	142	172	0

2019/20 strategic milestone RAG 

We are extending the life of our track-based signalling and control assets until they are replaced by either the Four Lines Modernisation or the Piccadilly Line Upgrade programmes. This ensures they can continue to support a safe, reliable and maintainable service until then.

Siemens is continuing the design for the life extension of the Central line signalling and control systems. This project will maintain the reliability, availability, maintainability and safety of the assets and resolve obsolescence concerns. Once the design of a number of items has been finalised, we will work with Siemens to deliver pilot sites and complete trials.

We have commissioned approximately two-thirds of the new Piccadilly line signalling control system at the control centre in west London. The migration of control between Acton Town and South Harrow was achieved in February 2019. The programme is progressing well and all remaining migrations are planned to complete by the end of 2019.

Works to enable the replacement of the signalling system at Northumberland Park depot on the Victoria line has commenced; this is required to interface with the new depot control system. A contract has been awarded for the design phase.

The EFC has reduced to £172m due to reduction in delivery costs as a result of changes to delivery strategy and cost challenge.

Assurance
 The Project Assurance Team completed a project assurance review on the Signalling and Control programme submission to the Programmes and Investment Committee meeting in March 2019. A quarterly update was provided to the Committee on 17 July 2019 on the nine recommendations that were made and accepted, including four by IIPAG. Three recommendations are closed and good progress is being made to close the remaining six. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Surface

Healthy Streets

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2021/22	467	873▼▼

2019/20 strategic milestone RAG

The Healthy Streets Approach prioritises health and wellbeing, with the overall objective of creating a transport system where everyone can travel safely by the healthiest and most resource-efficient means, specifically walking, cycling and public transport. It is central to achieving the 80 per cent mode share target in the Mayor’s Transport Strategy.

Highbury Corner

The footway paving and kerbing were completed at the beginning of June and the traffic switchover to two-way operation took place over the Easter weekend. The main highway and urban realm work is now complete; the road network is reconfigured and the gyratory at Highbury Corner removed. Planting of new trees and installation of new hostile vehicle measures within the urban realm area and outside Highbury and Islington station will follow in the autumn. The Mayor Sadiq Khan visited the site on 2 October.

Wandsworth Gyratory

This project is to remove the current gyratory system in Wandsworth town centre and provide significant improvements for pedestrians and cyclists. The purchase of properties from landowners on Putney Bridge Road continues to progress. The last three properties, of the first tranche of planned purchases, are expected to complete by late October. We are working with the London Borough of Wandsworth to ensure

EFC (£m)	EFC movement post plan (£m)
1,607▼▼	0

The EFC covers 2021/22 to provide a direct comparison to the programme as originally approved in 2017/18. The EFC has reduced since last quarter; it has been updated with the 2018/19 actuals and 2019/20 budget, and excludes projects transferred from the portfolio.

The 2018/19 actuals reflect Westminster’s decision to cancel Oxford Street pedestrianisation.

The Road Technology projects have transferred to the Surface Technology portfolio and highway schemes (s278) schemes have moved to Professional Services.

Spend authority is to the end of 2019/20 and has also been restated to remove the projects which have transferred.



Cycleway at Elephant and Castle

the project is value for money; we are currently reviewing whether all land take on Armoury Way is essential. Any changes to land take or the highway design will be communicated to the public in late autumn 2019. We plan to start work on site in late 2021, subject to the compulsory purchase process.

Fiveways

The project aims to alleviate congestion and smooth traffic flows at Fiveways Corner in support of the Croydon growth zone with its new housing and jobs for the area. Design assurance is currently underway and a detailed design and build contract is being prepared. A planning application for the scheme will be submitted in due course, followed by commencement of compulsory purchase orders.

Vauxhall Cross

This project will remove the existing one-way gyratory and enhance the interchange by improving the bus station, traffic, urban realm, cycle and pedestrian provision. The Vauxhall Cross island site planning application was called in by the Secretary of State for Transport and a public inquiry has been set for December 2019. Design assurance for the gyratory removal and improved bus station is due to be completed by the end of September 2019. We are considering how best to progress the project while the planning matter is decided.

Waterloo City Hub

This scheme provides a significant upgrade for the safety and comfort of pedestrians, cyclists and public transport users, with a new pedestrian walking route to the river, improved crossings, segregated cycling facilities and improved bus waiting and boarding areas. The proposed transformational scheme continues to progress well. The concept design has now completed and we are working with our supply chain to commence the detailed design of the scheme and aim to start construction in spring 2020, subject to securing the necessary consents. We continue to work closely with the London Borough of Lambeth and developers in the area, to ensure delivery is coordinated with existing and future plans for Waterloo.

Old Street Roundabout

This transformational project will bring safety improvements to cyclists and pedestrians including new and improved crossings, fully segregated cycle lanes, a new public space with a main accessible entrance to Old Street Underground station and the shopping arcade. Advanced construction works to remove the traffic islands on all four arms of the roundabout are complete and the traffic switchover to two-way operation was successfully achieved over the late May bank holiday weekend. This temporary switch closes the southeast arm of the junction to traffic to enable construction

of a new entrance to the Underground station near to Cowper Street. The existing subway canopy has been removed and construction to this station entrance will be complete in early 2020. Later this year, a further traffic switch will be required to reopen the southeast arm and permanently close the northwest arm, facilitating the construction of the public space and accessible main station entrance. Planning consent for the new main station entrance was granted by Islington Council in September 2019. Construction is on track to be completed by the end of 2020.

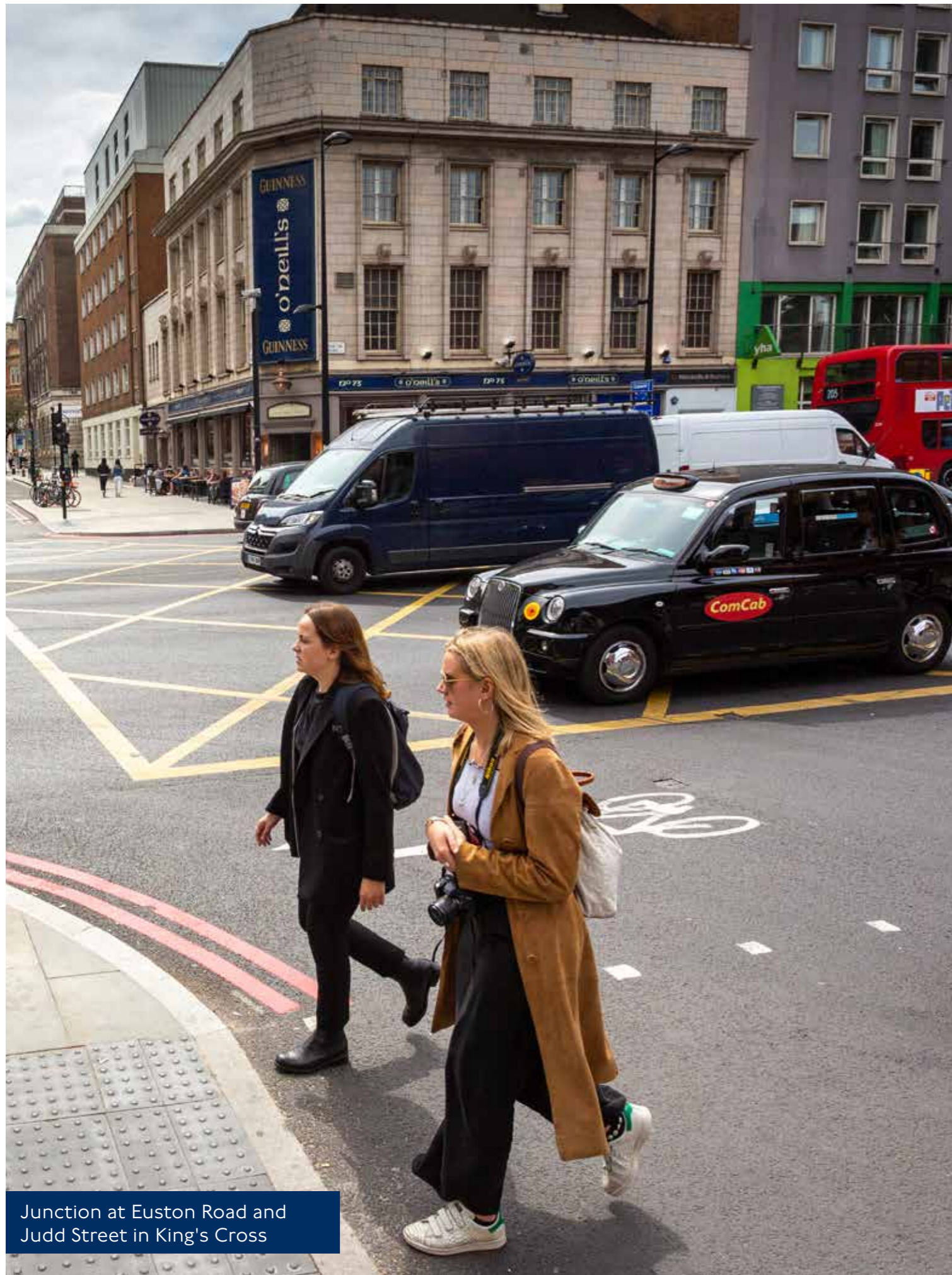
Lambeth Bridge North and South

This scheme provides a significant upgrade for the safety and comfort of pedestrians and cyclists, by removing the current roundabouts on both sides of the river and replacing them with signal controlled crossroads. The proposal includes segregated approaches for cyclists with dedicated cycle phases at the junction and new signal-controlled pedestrian crossing facilities. In June 2019, the project scope was increased to: include replacement of the waterproofing and expansion joints on the bridge deck; determine the work required to the drainage system; and include permanent protective security measures on the bridge. Work is progressing on designing these additional items. We continue to work with Westminster City Council to identify

a design for the northern roundabout which responds to the concerns raised during the 2017 consultation.

Cycleways

In May 2019, the length of protected cycle infrastructure surpassed the 2016 baseline of 53km, with 112km complete or under construction. This includes pedestrian and cycle improvements between Acton and Wood Lane along the A40, which started construction on 18 March with major carriageway works starting in early April. Other recently completed schemes include new pedestrian and cycle crossings at Edgware Road, which remove a key barrier on Quietway 2, and a route connecting Kensington High Street to Notting Hill. We have also introduced new pedestrian and cycle crossings across Euston Road at Judd Street and new segregated cycle lanes on Midland Road as part of Cycleway 6, providing a cycle route all the way between Elephant and Castle and Kentish Town. Construction work is also progressing well in the three Mini-Holland boroughs with 32 of the 103 Mini-Holland schemes now complete, including the A105 Green Lanes scheme, a five-kilometre protected cycle route linking Enfield Town to Palmers Green and installation of a new pedestrian and cycle bridge adjacent to Kingston Station. Construction is due to start on a number of major routes this year including Cycleway 4, which began on 5 July, and Cycleway 9 by the end of the year.



Junction at Euston Road and Judd Street in King's Cross

Work continues on several major new routes, identified in the Strategic Cycling Analysis published in 2017. Public consultations for walking and cycling improvements opened in May for routes between Hackney and the Isle of Dogs and Wood Lane and Notting Hill Gate, and for the route between Ilford and Barking Riverside in June. We also plan to consult the public on a number of other routes over the next year including routes between Dalston and Lea Bridge, Greenwich and Woolwich and Camden and Tottenham Hale.

Construction started for Cycleway 4 on 5 July 2019, following the completion of the detailed design and a successful Integrated Assurance Review to request funding for delivery. Works have begun at three locations: on the A200 Jamaica Road, Rotherhithe Roundabout and Tooley Street, and are anticipated to complete by May 2020. We are also planning the construction phases for the Lewisham and Greenwich sections of the project.

Cycleway between Acton and Wood Lane
Construction is progressing well to deliver pedestrian and cycle improvements on the route along the A40, and works are due to be completed in spring 2020.

Cycleway between Hackney and the Isle of Dogs

The public consultation for the route between Hackney and the Isle of Dogs closed on 21 June and the consultation report was issued at the end of September. The Mayor of Tower Hamlets is due to make a decision to support the CFR5 Scheme in October. In light of residents' concerns raised in the report the Mayor may request changes to the scheme, which would affect delivery timescales.

Rotherhithe to Canary Wharf Crossing

Following the decision of the Programmes and Investment Committee on 21 June that the crossing should revert to feasibility, we have been examining options for a new ferry service, with work focused on route planning, fares, vessels, piers and connectivity to the local area. It is envisaged the feasibility work will continue through to November, and following an assurance review a report will be prepared for the Programmes and Investment Committee setting out the recommended way forward. The work on a new ferry to improve connectivity for pedestrians and cyclists between Rotherhithe and Canary Wharf is alongside the wider investment we are making in walking and cycling in the area, including delivery of Cycleway 4 and new cycle routes from Rotherhithe to Peckham and Hackney to the Isle of Dogs.

Safer Junctions

In April 2017, the Safer Junctions list highlighted 73 of the most dangerous junctions on our road network, defined as those with the highest vulnerable road user collision rates. We have now completed work at 29 of these junctions, with 12 more planned for completion by spring 2020. Public consultation on five Safer Junctions started in June, with engagement planned on a further four locations over the summer. The locations are Clapham Road/Union Road, Kennington Park Road/Braganza Street, East India Dock Road/Canton Street/ Birchfield Street, Edgware Road/Harrow Road and Kingsland Road/Balls Pond Road.

Lowering speed limits

In July 2018, the Vision Zero Action Plan was launched in conjunction with the Metropolitan Police Service, setting out our commitment to introduce a 20mph speed limit on the TLRN in central London by May 2020 (phase one) and lower the speed limit on a further 155km of Transport for London Road Network (TLRN) by May 2024 (phase two). Phase one concept design and consultation completed on 10 July. Our proposals include installing 20mph signs and road markings on all routes, installing raised pedestrian crossings in seven locations where clusters of collisions (that led to someone being killed or seriously injured) have occurred and where there are high volumes of people walking, and recalibrating all existing speed cameras in central London to enforce 20mph speed

limits instead of 30mph. Analysis of the consultation results is now complete and the consultation report was published on 6 September 2019 indicating we intend to proceed with implementation as planned, subject to statutory engagement and permitting. Phase two of the programme has also mobilised and started to integrate lower speed limits into existing projects, to accelerate delivery as far as possible. Proposals will include a mix of signs, lines and physical infrastructure.

Direct Vision Standard

We are committed to reducing road danger for vulnerable road users. We have developed the world's first Direct Vision Standard (DVS) to measure the volume of space that a heavy goods vehicle (HGV) driver can see directly from each vehicle's cab. DVS will give regulators, manufacturers, operators and contractors an objective standard to rate and improve the safety of HGVs.

As the DVS and HGV Permit Scheme proposal for London amounts to a technical regulation, we were required to notify the European Commission to ensure it did not conflict with 'free movement' within the European Union. We were notified on 6 December 2018 that the European Commission had no objections to our proposals.

Following public consultation, statutory consultation started in April 2019 for the introduction of this standard which could be applied to prevent vehicles with the



lowest ratings from entering London from 2020. Public consultation closed in May 2019, and no objections were received to necessitate a public enquiry. London Councils confirmed the Traffic Order Regulation in August 2019. The registration system to enable HGV drivers to apply for DVS permits will go live by the end of 2019.

DVS contributes directly to the Mayor's Vision Zero objective to eliminate death and serious injury from London's roads.

Crossrail complementary measures

We are working with the boroughs, Crossrail Ltd and Network Rail to develop and deliver a programme of improvements to 17 stations in outer London to create capacity for additional footfall and regenerate the areas. So far, Crossrail complementary measures works are complete at five stations (Abbey Wood, Chadwell Heath, Goodmayes, Manor Park and Romford). Site works at eight stations (Forest Gate, Gidea Park, Hanwell, Harold Wood, Ilford, Maryland, Seven Kings and West Drayton) are at various stages of construction. Four stations, (Acton Main Line, Ealing Broadway, Southall and West Ealing) are at design or consultation stage.

The original Crossrail Ltd programme has slipped and a new programme has been developed by Crossrail Ltd for station works. Complementary works at some stations are dependent on station works and some of the west London stations will be completed later than

December 2019, as a result. This does not affect stage 5a planned changes to train services between Reading and Paddington.

Liveable Neighbourhoods

Liveable Neighbourhoods is a key part of the Mayor's Transport Strategy, which aims to create locally-led, attractive, healthy and safe neighbourhoods that encourage walking, cycling and public transport use and reduce car journeys. In 2018/19, feasibility funding was awarded for the first phase of the programme. Proposals for the first seven neighbourhoods include: the creation of a new public space in Crouch End and the introduction of new segregated cycle routes; removing the Greenwich town centre gyratory and reallocating more space to pedestrians and cyclists; and improving Romford town centre by making the busy ring road easier to cross on foot and by bike.

The second phase of funding was launched in February 2019. We received 22 bids from across London, 11 of which were awarded feasibility funding and started development work in April 2019. Projects awarded funding as part of phase two are: Bow (Tower Hamlets), Brixton (Lambeth), City Cluster (City of London), Croydon Old Town (Croydon), Custom House (Newham), Enfield Town Centre (Enfield), Holborn Gyratory (Camden), Ilford (Redbridge), Shortlands (Bromley), South Bermondsey (Southwark) and South Chiswick (Hounslow).

Feasibility work led by each respective borough for phase two projects is currently underway.

Borough Local Implementation Plan projects

Construction of schemes at Baker Street, Beddington, Feltham, Hayes town centre, Stratford gyratory and Tottenham Court Road (West End project) are currently complete or in construction, in line with the agreed programmes and budget allocations.

Construction has commenced at Hornsey Lane Bridge and the Blackhorse Road junction with Forest Road both on 10 June 2019. A safety-orientated scheme for Camberwell town centre on the TLRN is currently in detailed design with a planned start for October 2019. The scheme at Beam Parkway has been rescheduled for construction to overcome various modelling issues for buses.

A further 10 LIP3 submissions were approved by the Deputy Mayor in June, and LIP3 submissions for City of London, Redbridge, Newham and Southwark are progressing. As at the start of July, the Borough LIP3 submission for Merton was outstanding, due to issues with Cabinet Member sign-off but were expected to be resolved in August 2019, and Kingston's submission has been delayed by consultation over their Strategic Environmental Assessment (SEA).

Assurance

The Project Assurance Team completed a project assurance review on the Healthy Streets programme submission to the Programmes and Investment Committee meeting on 17 July 2019. Thirteen recommendations were made and accepted, including seven by IIPAG. Good progress is being made to close the recommendations. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Air quality and environment

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2022/23	152	280

2019/20 strategic milestone RAG

The Air Quality and Environment programme reduces the impact of transport on air quality and climate change by targeting vehicles in our contracted and regulated fleets, and all vehicles driving in London

Ultra Low Emission Zone update

On 8 April 2019 we successfully introduced the new Ultra Low Emissions Zone (ULEZ) in central London. It enforces the world's toughest vehicle emission standard and is the first to operate 24/7. The ULEZ has replaced the T-Charge and operates in the same area of central London as the Congestion Charge. The initial running of the scheme has gone well, and we are now seeing 75 per cent compliance within the zone, which is ahead of expectations.

We are tightening the Low Emission Zone (LEZ) standards to Euro VI for HGVs, coaches and buses from October 2020. The aim is to encourage increased efficiency of road freight movements and to promote the consolidation of road freight. Non-compliant and non-exempt heavy vehicles will be charged £100.

In October 2021 the ULEZ will be expanded to the boundary formed by the North and South Circular Roads. This will expand the ULEZ to 18 times its current size. An update on the delivery strategy was presented to the Programmes and Investment Committee in May 2019 allowing the project to move into the design phase for the systems and infrastructure. A further update will be presented to the Programmes and Investment Committee by the end of 2019.

EFC (£m)	EFC movement post plan (£m)
471▲	38

The EFC reflects the financial authority up to 2022/23. The £38m increase is materially driven by the enhanced taxi delicensing scheme announced by the Mayor in December 2018. This provides an additional £24m to support the trade and accelerate the drive to achieving the reduction in NOx emission of 45 per cent by 2020, by removing the most polluting taxis on London's streets. In addition, refined scope has been defined for projects, increasing the delivery costs for Low Emission Zone Strengthening (£12m) and Direct Vision Standard (£18m), which has transferred into the Air Quality portfolio from Technology.

This pressure has been offset by £11m relating to ULEZ Expansion as the delivery strategy is agreed and lower spend for Selective Catalytic Reduction (SCR) retrofit due to reduction in delivery units and release of risk.

Spend authority is to the end of 2022/23. The spend authority is less than the EFC as the programme is not currently fully authorised.



Ultra Low Emission Zone sign in London

Fleet compliance

To help meet the Mayor's Air Quality objectives in 2021, we are working to ensure that 4,000 of our bus fleet vehicles (which is two-thirds of all our buses) are Euro VI compliant by 2020. We completed the retrofit of 2,500 buses by the end of January 2019 and all buses in Low Emission Bus Zones (LEBZs) will be retrofitted by the end of October 2019.

We have introduced 10 LEBZs, with the retrofitted vehicles now contributing significantly lower NOx emissions on these corridors.

The completed bus zones are:

- Putney High Street
- Brixton – Streatham
- A2 Camberwell – New Cross
- A3 Wandsworth – St. John's Hill
- High Road (Haringey)
- A12 Eastern Avenue (Homerton Road)
- A5 Edgware Road
- Lewisham – Catford
- Edmonton – Seven Sisters corridor
- Stratford corridor

After the end of the quarter close, we continued to upgrade buses along the final two LEBZs, namely Chiswick High Road to Kensington High Street and Uxbridge Road to Shepherds Bush, which were successfully launched by mid August 2019. Over 1,000 buses operating along these final two LEBZs will now meet Euro VI emissions or better.

Ultra low emission vehicles - rapid charge infrastructure

To support the growing use of Zero Emission Capable taxis and electric vehicles, we are building a network of rapid charge points across London. By mid-July 2019, we had installed 190 rapid charge points, 73 of which are dedicated for taxis. We continue to prepare sites for installation, with the number of live sites planned to reach 225 by the end of 2019. We also continue to progress designs for two 'hub' sites, which have multiple rapid charge points. In addition, residential on-street charging is being installed in 23 boroughs via the Go Ultra Low City Scheme.

Recognising the need for a strategic approach to electric vehicle infrastructure, the Mayor launched the Electric Vehicle Infrastructure Taskforce in May 2018, to look at how much public infrastructure might be needed in London by 2025, and to mitigate any barriers to implementation. The accompanying delivery plan for electric vehicle infrastructure in London, to 2025, was launched in June 2019 and can be found at tfl.gov.uk/ev-charging-plan

Mayor's Air Quality Fund

The Mayor's Air Quality Fund (MAQF) is a £22 million fund over 10 years to support projects by London boroughs to improve air quality.

Projects supported in the third round of the MAQF were announced by the Mayor on 7 June 2019. In this round he is supporting four Low Emission Neighbourhoods and 11 other innovative air quality projects.

Go Ultra Low City Scheme

London's Go Ultra Low City Scheme bid was awarded £13m in capital funding to drive the uptake of ultra low emission vehicles in the period 2015/16 - 2019/20. 1,200 residential electric vehicle charge points have been installed by boroughs to date. The final round of funding, £4m, is now open for boroughs to bid for with a submission deadline of 31 October 2019.

Taxi and private hire (TPH) re-let

We will procure systems and services to support TfL licensing taxi and private hire vehicles (PHV) and PHV operators. We will ensure that business continuity is maintained and provide an efficient service to taxi and private hire vehicle owners and drivers. As all newly licensed taxis will be zero emission capable, the new contract will significantly reduce emissions in London, contributing to the Mayor's Air Quality vision.

Assurance

The Project Assurance Team completed a project assurance review on the Air Quality and Environment programme submission to the Programmes and Investment Committee meeting in December 2018. A quarterly update was provided to the Committee on 17 July 2019 on the eight recommendations that were made and accepted, including three by IIPAG. Four recommendations are closed and good progress is being made to close the remaining four. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Asset investment

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2021/22	245	303

2019/20 strategic milestone RAG

We maintain our surface assets in a safe condition through prioritised and planned works to replace, refurbish or partially reconstruct them. This programme maintains and lengthens the useful life of a wide range of assets, including carriageway, footway, lighting, drainage, bridges and tunnels, traffic signals, bus stations and river assets.

Ardleigh Green Bridge replacement

All construction works to replace the bridge were completed at the beginning of June and the benefits were achieved. The remaining railway-side works to remove remnants of the old bridge are to be agreed with Network Rail and are likely to be completed around Christmas 2020 when a suitable railway possession is available.

Bus driver facilities

Providing bus driver facilities aligns with the Mayor's Transport Strategy by ensuring the bus network is reliable and our bus drivers have the basic facilities required at work.

Good progress has been made since the Mayor announced increased funding for bus driver facilities in February 2018. A target was set to have a total of 42 priority routes with a permanent facility by the end of March 2020.

EFC (£m)	EFC movement post plan (£m)
599 ▲	14

The EFC covers 2021/22 to provide a direct comparison to the programme as originally approved in 2017/18. The increase in EFC this quarter reflects transfers of projects from other portfolios.

This is the second year without any Government operating grant. Consequently, the EFC reflects a deliberate, conservative approach to spend with a two-year pause on proactive renewals. In 2019/20 circa £10-15m of schemes will be programmed and designed ready for delivery in Q3 and Q4. If the forecast at the end of Q2 indicates that funding will not be utilised on reactive works then approval will be sought to utilise any forecast underspend for planned works.

In the medium to long term, new sustainable funding sources for London's roads will need to be identified.

The majority of these new facilities will be stand-alone permanent toilet units, adjacent to the bus stands where they are required. Where possible, we are adapting existing infrastructure to ensure integration with the local environment.

We have delivered a permanent or temporary facility on all of the 42 routes by the end of July 2019, exceeding the original target.

Hammersmith Bridge

Recognising the impact the closure of this strategic route is having on local residents, we have been working with the London Borough of Hammersmith & Fulham to progress an appropriate solution. Tenders for the concept design of the bridge were received. Pell Frischmann has been awarded the contract for engineering services with contract sign off expected by the end of September. It is imperative we progress the design as quickly as possible, while in parallel trying to identify an appropriate funding source for building a replacement to this vital cross river link.

Rotherhithe Tunnel

Rotherhithe Tunnel, opened in 1908, is a single-bore road tunnel carrying the A101 beneath the River Thames in East London. Rotherhithe Refurbishment Works include the following key items: 1) renewal of tunnel lighting and its cable

support; 2) replacement of fire main system; 3) provision of resilient power supply; 4) upgrade and reconfiguration of ventilation system and as well as other mechanical, electrical and civil assets which are life expired/safety critical to the operation of the tunnel.

A Quantitative Risk Assessment (QRA) has been completed and has confirmed the appropriate ventilation system for safely managing fires given the tunnel configuration and vehicle sizes. The QRA has been peer-reviewed by an external consultant and their comments addressed. The project has now moved to concept design, which will be carried out by TfL tunnel specialists.

Assurance

The Project Assurance Team completed a project assurance review on the Asset Investment programme submission to the Programmes and Investment Committee meeting in October 2018. A quarterly update was provided to the Committee on 17 July 2019 on the 12 recommendations that were made and accepted, including five by IIPAG. Eight recommendations are closed and good progress is being made to close the remaining four. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Public transport

Forecast completion year

2021/22

Spend to date (£m)

222

Spend authority (£m)

347

2019/20 strategic milestone RAG



Post quarter end, in August, works at White Hart Lane London Overground station were completed. Customers were welcomed through new station entrances into a bigger, brighter and more accessible station which included step-free access from street to platform for the first time. The design of the new station has been carefully planned to provide quicker and easier access for commuters.

We have started the installation of a train protection warning system for the Richmond to Gunnersbury section to enable us to interchange the fleet between lines and improve reliability across the network. Construction works are due to be completed in the autumn.

At West Hampstead, works have progressed with the new concourse now in passenger use and lifts due to be brought into use before the end of the September. The next steps are to complete the platform widening at the western part, which is planned to be completed in the autumn.

We are progressing with a design for updated signalling to enable the East London line to run 18 trains per hour. The design programme for the associated signalling works has been accelerated and is planned to complete in spring 2020.

EFC (£m)

394

EFC movement post plan (£m)

0

The EFC and spend authority covers the period to 2021/22 to provide a direct comparison to the programme as originally approved in 2017/18. The spend authority is less than the EFC as the portfolio is only part authorised.

The Gospel Oak to Barking line is now exclusively operated by new four-car electric air-conditioned trains, doubling capacity, restoring a 15-minute frequency and bringing greater reliability to the service. To celebrate this milestone, and to thank customers for their patience during the delay bringing the new trains into service, we offered customers a month of free travel on the line in September. This was in place from Saturday 31 August to Tuesday 1 October inclusive.

The month of free travel for those using the Gospel Oak to Barking line was requested by Mayor Sadiq Khan earlier this year. It was funded by the manufacturer, Bombardier Transportation.

The new state-of-the-art trains can carry nearly 700 people and feature free WiFi, real-time information screens, air-conditioning, USB charging points and more wheelchair spaces. The first of the new trains began carrying passengers in late May, and over the summer more units have been tested and brought into service to bring the Gospel Oak to Barking line, which is used by 30,000 people daily, back up to its full four trains per hour frequency. The new electric trains, which have replaced older diesel trains, are also much better for air quality and the environment.

DLR

High voltage works have commenced at Stratford Street Market with the installation of a new transformer which once commissioned will provide future resilience. Preliminary designs have been completed for similar works at Poplar depot.

We have embarked on a number of infrastructure projects, including repointing of bridges and viaducts, and North Route staircase tread replacement.

Replacement of old lighting to LED continues at West India Quay and Shadwell.

Track renewals continue to be delivered during weekend closures and non-operational hours. Sections of track between Canning Town and South Quay have been completed to date.

The upgrade and fit-out works at Custom House station are progressing while the station remains operational.

The public address system installation is progressing with testing and commissioning works to be completed at Westferry. The main radio resilience works have been completed with testing and commissioning planned for this financial year.



Class 710 arrives at Blackhorse Road operating the Gospel Oak to Barking line

London Trams

As part of our commitment to making the tram network safer following the tragedy at Sandilands in 2016, we are continuing to address the recommendations from the Rail Accident Investigation Branch. We have completed a number of initiatives and are currently in the delivery phases of the Physical Prevention of Over-Speeding automatic braking system and the enhanced lighting for the Sandilands tunnel. We continue to evaluate design for tram emergency lighting.

The renewals programme consists of 17 projects across seven asset groups including fleet, power, and permanent way infrastructure. Overhauls of the hydraulic power units and brake callipers on the Bombardier CR4000 fleet have been completed ahead of schedule and to budget. The bogie overhauls have progressed well with over two-thirds of the CR4000 bogies overhauled to date.

Replacement of this year's parafil support wires, which hold up the overhead power lines, is progressing well. Additional design work for the rebalancing of power within the tram depot has been finalised and a new contractor will soon be appointed to deliver the works.

Following the switch to cashless trams in July 2018, the existing ticket machines, which date back to the opening of the system, have been removed from all but three tram stops in Blackhorse Lane, Mitcham and Wimbledon. The remainder will be removed during November 2019.

Following commissioning of the centre platform at East Croydon, training of the operational staff is currently being delivered by Tram Operations Limited and is expected to be completed by December 2019. Once accomplished, this will improve local operations at East Croydon and increase the resilience of the tram network, particularly in the town centre.

Discussions are ongoing with Network Rail on a revised programme for completing the outstanding works at Wimbledon.

Replacement of half of the two Victorian bridges at Blackhorse Lane has been completed, and service diversions are ongoing. The works are forecast to be finished during spring 2020, with single lane traffic operation expected to be in place by the end of 2019.

Tram track renewals between Addiscombe Road and Blackhorse Lane have been successfully delivered, and planning for the Love Lane renewal in autumn 2019 is in progress.

Replacement of the Ampere Way retaining wall was completed in August 2019.

The systems obsolescence management project has completed its enabling works and began critical migration activities in summer 2019 which will continue through to December 2019.

Bus Safety Standard

Vision Zero aims to achieve zero fatalities and serious injuries on our road network by 2041. The interim target for buses is zero fatalities, on or caused by a bus, by 2030. The Bus Safety Standard is the programme of work that is looking at improving the safety of London's buses in working towards Vision Zero.

The Intelligent Speed Assistant (ISA) application controls bus speeds using geo-fencing via GPS to the bus, linked to a safety zone speed map. This is an aid to the driver and does not replace the driver responsibility for maintaining the correct speed. 700 buses have been ISA enabled as of April 2019 and a further 400 buses are expected to be ISA

enabled by March 2020. All new buses that entered into service from the end of September 2019 are now ISA enabled as standard.

The Acoustic Vehicle Alerting System (AVAS) is a system to be fitted to quiet running buses: electric, hydrogen and hybrid (when in electric mode). The system comprises a distinctive sound to alert the public that a quiet running bus is approaching, moving off from stationary or accelerating. The development of the distinct sound is underway and expected to be trialled on buses later this year. New buses entering service from September 2019 are expected to have AVAS fitted as standard.

Accident evidence suggests that current near-side mounted bus mirrors have blind spots, which have resulted in cyclists and pedestrians being injured. A new near-side blind-spot mirror is to be rolled out to replace the existing mirror. The off-side mirrors will also be replaced to further reduce blind-spots and avoid driver confusion by standardising the side-mounted mirrors across our fleet. The blind-spot mirror is expected to be fitted to all buses by March 2020. All new buses will have the blind-spot mirrors fitted as standard.

Hydrogen buses

To help reach the Mayoral target for all buses to be zero emission by 2037 and meet the Mayor's air quality objectives, we are procuring 20 hydrogen fuel cell buses and building a Hydrogen Refuelling Station (HRS).

The contract has now been awarded for the construction of the HRS which is to be built at Perivale Bus Garage and be operated by bus operator Metroline. The supplier has produced initial designs and these have enabled the compiling of a planning application for the construction of the HRS which was submitted to Ealing Council in July. The station is due to be operational by March 2020. Following the Quarter end, the manufacturer of these buses, Wrightbus Limited, has gone into administration and we are working with the administrator to understand the impact on the project.

An order has been placed for 20 hydrogen fuel cell buses using the existing framework contract. The bus suppliers are mobilising to produce a bus earlier than originally scheduled to ensure capacity and bus safety standards are reached. The first buses are due to arrive in London in January 2020.

Following the quarter end, the manufacturer of these buses, Wrightbus Limited, has gone into administration and we are working with the administrator to understand the impact on the project.

Assurance

The Project Assurance Team completed a project assurance review on the Public Transport programme submission to the Programmes and Investment Committee meeting in December 2018. A quarterly update was provided to the Committee on 17 July 2019 on the seven recommendations that were made and accepted, including two by IIPAG. Six recommendations are closed and good progress is being made to close the remaining recommendation. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Surface technology

Forecast completion year

2023/24

Spend to date (£m)

3

Spend authority (£m)

85

2019/20 strategic milestone RAG 

This is a new programme responsible for overseeing strategically important technology projects within our five-year business plan and, from April 2019, to provide a structure for all future technology projects being delivered by surface transport.

Surface Intelligent Transport Systems (SITS)

We are leading the way in delivering innovative new road traffic management systems to make journeys on foot, bike and bus, as well as essential emergency services and freight trips, as efficient as possible. We are working with Siemens to develop the Real Time Optimiser system. This will manage the flow of people on London's road network by controlling the phasing of traffic signals using pre-planned timetables, manual interventions and optimisation techniques, with the first release scheduled for late 2020. We are currently in the process of finalising the appointment of a new delivery partner, to work with us to design, develop and implement a new incident management system, which will enable us to increase the speed at which we detect and respond to incidents on the road network.

EFC (£m)

177

EFC movement post plan (£m)

0

The EFC reflects the financial authority, and the 2019 Programmes and Investment Committee authority, up to 2023/24. Surface Technology is a new portfolio and their first paper was submitted to the Programmes and Investment Committee in March 2019. The spend authority is below EFC as the portfolio is only part authorised.

Assurance

The Project Assurance Team completed a project assurance review on the Surface Technology programme submission to the Programmes and Investment Committee meeting in March 2019. A quarterly update was provided to the Committee on 17 July 2019 on the 10 recommendations that were made and accepted, including three by IIPAG. One recommendation is closed and good progress is being made to close the remaining nine. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Other

Technology and data

Forecast completion year

2020/21

Spend to date (£m)

66

Spend authority (£m)

228

2019/20 strategic milestone RAG



The Technology and Data programme provides the core infrastructure, services and technologies that allow us to achieve our strategic priorities.

Payments

We are continuing development work to allow pay as you go to be accepted between Reading and Paddington when TfL adopts the local services in December 2019. We are also in discussion with the train operating companies and the Department for Transport regarding the necessary changes to agreements which will facilitate this.

Evergreen programme

Over 6,500 new thin client devices have been successfully deployed to the TfL estate, while the remaining 1,000 (of the 7,500 purchased) continue to be deployed and we expect completion during summer 2019.

150 pilot users have successfully been migrated to Windows 10 on thin client devices, hosted by temporary servers, while the all-new Windows 10/Citrix server infrastructure has been successfully installed and tested in the TfL data centres. The new servers have been in production from August 2019, progressively providing Windows 10 thin client desktop images for up to 15,000 concurrent users.

EFC (£m)

215

EFC movement post plan (£m)

13

Authority and EFC shown are for financial years 2018/19 to 2020/21.

We have successfully deployed over 1,000 laptops with Windows 10 and Microsoft Office software to early adopters across several departments, including Smart Working pilot areas. A further 500 Windows 10 laptops have been ordered for the initial waves of Smart Working roll-out which commenced in Q2.

A business engagement network of Leads and Champions has been established to guide and assist the formal roll out of Windows 10/Office 365, which started at the end of May 2019. So far, 350 users have officially migrated to Windows 10 in addition to the early adopter community, with further deployments scheduled through to winter 2019.

User acceptance testing of business applications migrating to Windows 10 continues to progress well. Critical applications were prioritised, with others scheduled to support the formal roll-out phases.

Content and collaboration

The SharePoint Legacy Consolidation project is in the implementation phase, and 205 SharePoint 2010 sites have been migrated to SharePoint Online.

The Livelink Upgrade project continues, with successful Proof-of-Concept builds for the new operating systems, and the new servers for the test and development environments built.

Operating and monitoring systems

The Future Bus Systems project is delivering the design documentation for the solution to replace our obsolete bus scheduling tools: BusNet, Caesar and SSTT.

Hosting – data centre rationalisation and cloud migration

The new lease agreement for our primary data centre has been executed by both parties. Two-thirds of the data centre was vacated and returned to the landlord ahead of the lease end date of 31 July 2019 and the circa £4.6m per annum savings can now be realised against our operating costs. We continue to develop a hybrid hosting operating model in which we have extended our data centre core capabilities into the public cloud through AWS and Azure. We are expanding these capabilities to deliver stronger governance, operational controls and cost transparency to yield additional efficiencies. We are also implementing new infrastructure technology in our data centre as part of the technology refresh project which will deliver further operational efficiencies and keep our estate technically supported.

Cyber security

Assessments of systems in scope for the Networks and Information Systems (NIS) regulation are now concluded. A summary of the assessments has been compiled and presented to the Executive Committee. Additional summaries by functional/business areas are being provided to service owners for approval, ahead of sharing the assessments with the competent authority, the DfT.

Data and analytics

To support the Mayor's Transport Strategy, and specifically Vision Zero, we have produced a tool that takes bus telemetry data and overlays this on to the speed limits across the network to identify where bus drivers are exceeding the limit. This is in the final stages of development and once complete will allow for more accurate information when dealing with bus companies.

We are in the final stages of development to support major system changes as part of Future Ticketing Programme Phase 4 and are taking in new data that will feed into the revenue allocation reports with the TOCs to enable more timely reporting.

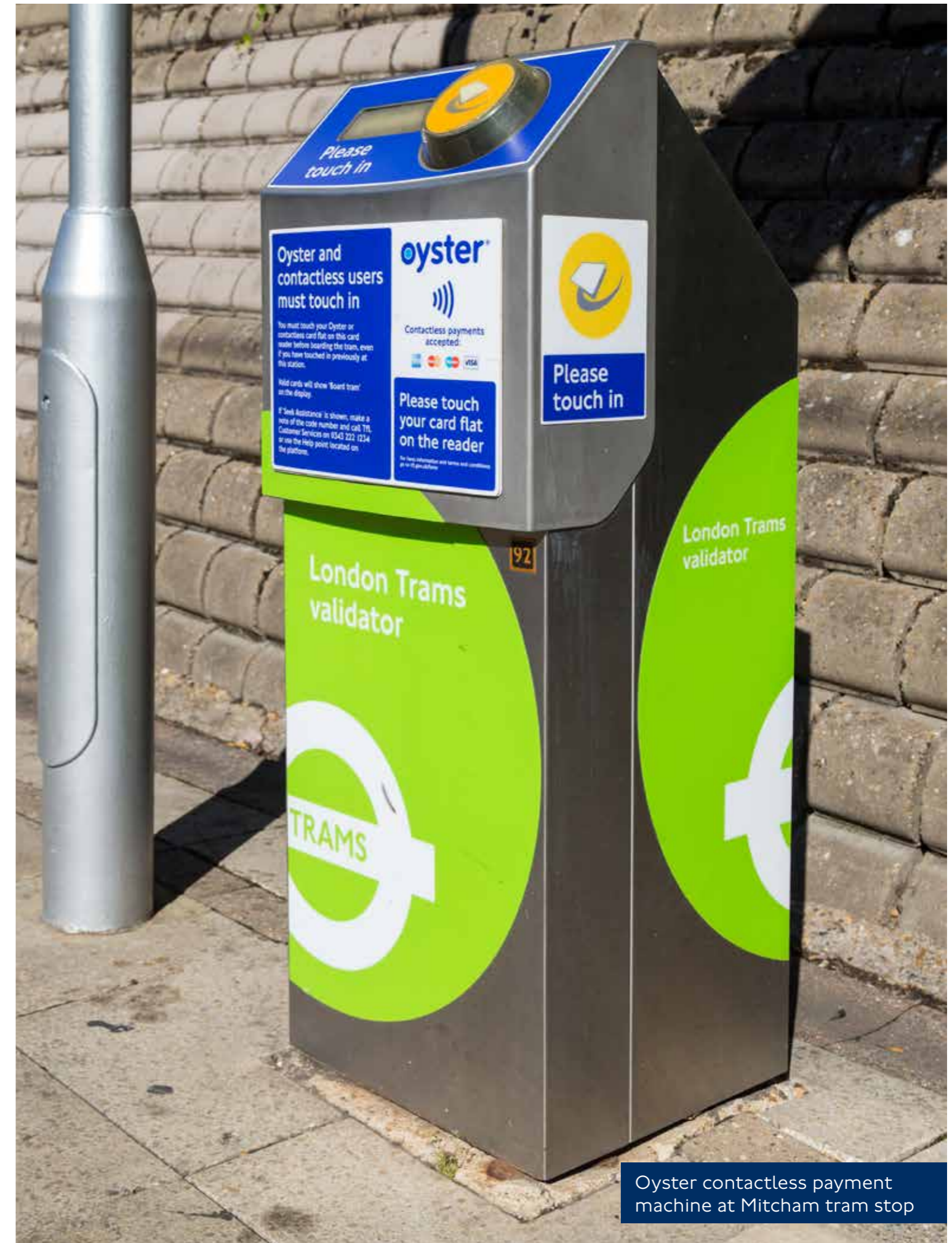
We are continuing to develop a product which detects fare evasion from patterns in ticketing data (Irregular Travel Analysis Platform - ITAP) which is in live trial and being used in a number of revenue deployments. We are working to secure funding for this financial year to move this into a supported production service.

We are continuing to provide analytic services that underpin London Underground's visualisation programme. We are working with the performance analysis and improvement programme and have created various reports and implemented system changes in the past quarter.

Networks

The Access and Wide Area Network (WAN) transformation programme has rolled out our new WAN services at 133 sites.

The delivery of the London Underground Connect radio system upgrade has started. The required equipment has been installed at all five core sites (King's Cross St Pancras, Shepherd's Bush, Liverpool Street, Stepney Green and West Kensington) and these sites have been prepared for port and switch acceptance testing over a five-week period. Preparations for the operational exit of the Connect Private Finance Initiative and transition to the successor arrangements with Thales are on schedule to complete by November 2019.



Oyster contactless payment machine at Mitcham tram stop

We continue to deliver infrastructure to support the Home Office's new national Emergency Service Network (ESN) communications system. We have installed 295km of the required tunnel fibre (73 per cent), pulled 335km of the tunnel leaky feeder (80 per cent) and fixed 97km of this leaky feeder (23 per cent). We are now working in areas of higher asbestos risk and non-LU areas that require different working methods; however, we are increasing the number of installation teams to address this. The outstanding snagging work is being completed at the first 25 stations (Phase IA), installation work has started at all of the next 14 stations (Phase IB) and design work has started for a further 12 stations (Phase IC). These 51 stations represent 50 per cent of the total required stations works.

We have signed a new grant agreement with the Home Office for £24m to cover further ESN installation works to the end of 2019/20. We have also agreed with the Home Office to align the ESN project with our Telecommunications Commercialisation Project (TCP) following an exchange of letters between the Commissioner and the Permanent Secretary. As a result we have included the majority of the remaining ESN installation work and ESN service management requirements in the TCP procurement. In parallel, we are

undertaking the preparatory work to install a second leaky feeder (required for public 4G services) on the Victoria line and have started the design work on the Elizabeth line and Northern Line Extension, which will complete by the end of the year.

The 4G Pilot project is now established and we have signed a contract for the delivery and service management of the solution. The scope of the 4G Pilot will be the station areas, platforms and tunnels of the Jubilee line between Westminster and where the line emerges above ground before Canning Town (excluding the station areas of Waterloo and London Bridge stations which, subject to final approvals, will be added later during 2020). We have baselined a plan that is targeting the service being operational from March 2020. Design work has started which includes engagement with all four mobile network operators.

Technical refresh and technical service operation

Our mission-critical systems have been identified, prioritised for restoration and assessed in terms of resiliency. Implementation has commenced for delivering resiliency for underpinning technical services and business services with the highest risk.

We are in the process of reviewing final submissions from bidders to supply a service desk, deskmate support and hardware repair and build services. These services are currently supplied through multiple providers, and this procurement process will bring these services under a single contract and supplier. It is expected that the contract award will take place in Q2 of 2019/20, with a service commencement date in Q4 of 2019/20.

The in-housing of managed service transition activities due to complete in Q3 2019/20 are on track and progressing to expectation.

Contact Centre Operation

The Oyster Photocard concessions contract was awarded to Novacraft at the end of 2017, with transition taking place since then. Service commencement for the new contract took place on 1 January 2019. A new online customer portal with enhanced functionality is in the process of being built.

Assurance

The Project Assurance Team completed a project assurance review on the Technology and Data programme submission to the Programmes and Investment Committee meeting in March 2019. A quarterly update was provided to the Committee on 17 July 2019 on the seven recommendations that were made and accepted, including five by IIPAG. Good progress is being made to close the recommendations. The Project Assurance Team tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Growth Fund

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
2024/25	0.4	144	144	0

2019/20 strategic milestone RAG

The programme allocates funding to support transport schemes that help to unlock housing and commercial developments and support regeneration opportunities in some of London's key growth areas.

Existing Growth Fund schemes

The Growth Fund contributes to 15 existing schemes that will support more than 55,000 new homes and 30,000 new jobs. Recently completed schemes include the transformation of the northern roundabout at Elephant and Castle.

Significant progress has been made in upgrading and developing stations such as Woolwich (Elizabeth line), Tottenham Hale, White Hart Lane and West Ham, which all support new housing developments. Our investment in the transport infrastructure has been supported by financial contributions from developers and other sources, including the GLA.

Sutton link

A detailed option selection process has been undertaken, including a public consultation on a shortlist of options.

Committed schemes

We made recommendations to the Programmes and Investment Committee to provide contributions to support three schemes that met our agreed criteria.

These are:

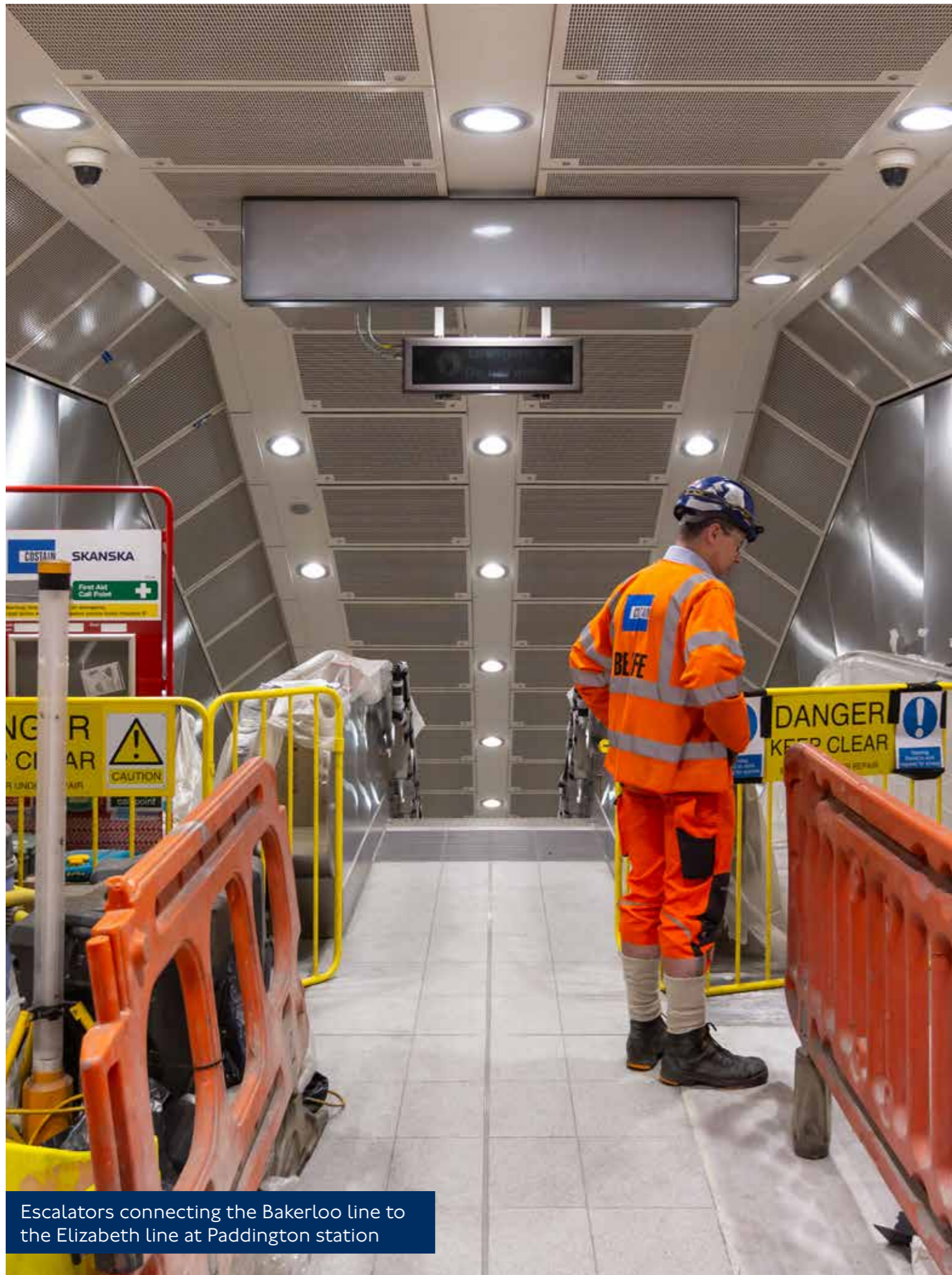
- A new southern entrance at Ilford station to address capacity issues resulting from growth in the area, and to benefit bus passengers arriving at the station
- An upgrade at Colindale station in the first phase of a development programme to bring 10,000 new homes to the Colindale area
- An upgrade at Walthamstow Central station, with improved entrances and step-free access, to provide additional capacity to support new homes and jobs in Walthamstow town centre

The Elmers End scheme is currently funded for the acquisition of the required land and we continue to liaise with the London Borough of Croydon on funding opportunities for the second phase for the detailed design and construction for enhancements to the London Trams network, which will include Elmers End

We are working with the GLA to select the next set of projects to receive Growth Fund support and to seek funding for certain schemes through the Government's Housing Infrastructure Fund and Business Rates Retention Pilot scheme.

Assurance

The Project Assurance Team completed a project assurance review on the Growth Fund submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 17 July 2019 on the 11 recommendations that were made and accepted, including four by IIPAG. All recommendations are now closed.



Escalators connecting the Bakerloo line to the Elizabeth line at Paddington station

Elizabeth line

On-network stations improvement programme

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2020	79	94

2019/20 strategic milestone RAG

EFC (£m)	EFC movement post plan (£m)
95	1

The EFC has increased this quarter because of the inclusion of additional third party funded scope into the programme. This has no impact on the net EFC of £94m reported in the previous quarter.

This programme focuses on 22 existing stations, ensuring improved customer experience and step-free access, and a consistent station environment across the Elizabeth line.

Work on Great Eastern step-free schemes has been completed with lifts at Maryland, Manor Park and Seven Kings in use since late February 2019. The handover of the assets from the contractor to Rail for London Infrastructure is also nearing completion and final inspections were finished in early September.

On the Great Western section lift schemes at Hanwell, Iver, Langley and Taplow, construction is still progressing with steelwork installation ongoing and the transition into the fit-out phase started as planned in August 2019. Lifts are expected to be available for public use towards the end of the year in line with our commencement of train services between Paddington and Reading.

MTR Crossrail is continuing its station refurbishment programme with works to redecorate platforms at Brentwood, Harold Wood, Gidea Park and Romford completed and works underway to refurbish/redecorate Hanwell and West Drayton stations on the Great Western section.



Rolling stock

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2020	959	1,149

2019/20 strategic milestone RAG

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

Post quarter end, a significant milestone was reached when the first nine-car train was introduced into passenger service operating between Hayes and Harlington on 29 July.

Testing of the train and Automatic Train Operation (ATO) signalling continues in the central section tunnels of the Elizabeth line, including transitions to the Network Rail mainline routes to the east and west and running multiple trains in the same tunnel under the control of the ATO system. Train and train signalling control software is progressing to the end of the development stage. The versions for the next phase of the Elizabeth line, Trial Running, were confirmed in August and will be tested in autumn 2019.

Testing continues using the European Train Control System (ETCS) for operation to Heathrow Airport, with development and testing approaching the end in preparation for reliability and operational trials before submitting the case to the Office of Road and Rail for authorisation to operate ETCS-fitted Elizabeth line trains in passenger service. Reliability testing of integrated ETCS and ATO signalling equipment on Elizabeth line trains has continued on the Great Western Main Line with a positive 11,000 miles accumulated to date.

EFC (£m)	EFC movement post plan (£m)
990	7

The EFC has increased this quarter because of a change in the accounting treatment of funding received from a third party.

This has no impact on the net EFC of £983m reported in the previous quarter.



Crossrail

Forecast completion year	Spend to date (£m)	Spend authority (£bn)	EFC (£m)	EFC movement post plan (£m)
TBA	*	17.6	*	*

2019/20 strategic milestone RAG

Following the approval of a revised delivery schedule by the Crossrail Board on 25 April 2019, the Crossrail team is now focused on a detailed plan and is using this to update its forecast for the final project cost.

The plan is aligned with the six-month opening window announced in April 2019, which covers October 2020 to March 2021 and the funding envelope announced in December 2018.

Close headway multi-train testing in the tunnels has now commenced with a minimum safe distance between trains, at slow speed, of only 50 metres. The project team continues to work collaboratively with Siemens and Bombardier to develop the software to the level necessary for full trial running early next year. Trial running also requires further progress in other aspects of testing and commissioning, including communications systems and also on the physical infrastructure, notably at Bond Street.

Maintenance teams started moving into the new Maintenance Management Centre at Plumstead at the end of June 2019. Training and familiarisation continues although transfer of maintenance information from contractors continues to be slower than planned. Some limited track inspection is now being carried out by our maintenance teams and this has proved extremely valuable. Work is underway to increase the scope of the maintenance remit and allow the construction contractor to focus more on their remaining tasks.

*This information is withheld for reasons of commercial sensitivity

Appendix

2019/20 Strategic milestone performance

Our 2019/20 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 the following key:

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

Commentary is provided on milestones that are forecast to be delivered significantly (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 ■			
First customer services start on the new higher capacity moving block signalling system	30-Apr-19	17-Mar-19	Complete ■
Use of the new, higher capacity signalling system for customer service extends to the north side of the Circle line and to all other lines	22-Sept-19	22-Sept-19	■
Piccadilly Line Upgrade programme ■			
Complete the concept design of new Piccadilly line rolling stock and present first look walkthrough of DTUP air-cooled trains	15-Jan-20	04-Nov-19	■
Network extensions			
Northern Line Extension ■			
Track installation complete	28-Jun-19	03-May-19	Complete ■
Essential power supplies available at all sites for testing and commissioning work to begin	16-Mar-20	25-Feb-20	■
Silvertown Tunnel ■			
Contract to design, build, operate and maintain the tunnel begins*	29-Oct-19	20-Aug-19	■

*Due to the legal challenge at post quarter end, the forecast date for the contract award is now 14 November

Milestone description	Plan date	Actual/forecast date	Status
Barking Riverside Extension ■			
Main works commence for Barking Riverside Extension	19-Apr-19	19-Apr-19	Complete ■
Completion of I6 Day Network Rail Blockade (works to Support New Viaduct)	04-Aug-19	03-Aug-19	Complete ■
Major stations □			
Bank station – commence construction of new triple escalator tunnel to serve DLR customers at Bank station and relieve congestion	31-Mar-20	07-Feb-20	■
London Underground			
Station renewals and enhancements ■			
22 lift and escalator replacement and refurbishments complete on London Underground	31-Mar-20	18-Feb-20	■
Tottenham Hale – new station entrance and concourse opens to the public	31-Mar-20	19-Jun-20	■
Delays due to change in sequence of works and introduction of other works. Some works that were planned to be carried out in possessions will now be undertaken in Engineering hours			
Accessibility ■			
Eight more London Underground stations become step-free	31-Mar-20	04-Jun-20	■
Some delays due to unforeseen ground conditions and legacy assets across multiple stations. We are working with the contractor to recover the programme.			
Track renewals ■			
Install 7.5km of new track across the London Underground network	30-Mar-20	29-Mar-20	■
Rolling stock renewals ■			
Victoria line Fleet Programme Lift – first train enters production	31-Jul-19	01-Jul-19	Complete ■
Jubilee line fleet refurbishment is complete and all trains are compliant with the RVAR	31-Jan-20	05-Dec-19	■
Central line – begin refurbishment and life extension work on first production train	31-Mar-20	22-Oct-19	■
Signalling and control ■			
Piccadilly line interim signal control upgrade complete	26-Jan-20	28-Oct-19	■

Milestone description	Plan date	Actual/ forecast date	Status
Power cooling and energy ■			
First solar panels installed, representing the commencement of large-scale solar generation on our buildings (BIU Tranche1)	18-Feb-20	10-Mar-20	■
Croydon Tram Link IGP Review and Comment and IGP Comment Acceptance were delayed resulting in overrun against this milestone.			
Surface			
Healthy Streets ■			
Old Street Roundabout Removal – main works start	31-May-19	28-May-19	Complete ■
Highbury Corner Gyratory Removal – traffic switches to two-way system	13-Jul-19	22-Apr-19	Complete ■
Cycle Superhighway 4 – detailed design for Jamaica Road signed off	30-Aug-19	28-Jun-19	Complete ■
Direct Vision Standard – launch of system to enable heavy goods vehicle drivers to request Direct Vision Standard permits	29-Oct-19	28-Oct-19	■
Cycle Super Highway 9 – completion of detailed design for Kew Bridge section	06-Dec-19	13-Sep-19	■
Air quality and environment □			
Launch of central London ULEZ scheme	08-Apr-19	08-Apr-19	Complete ■
All buses in Low Emission Bus Zones are retrofitted with new bespoke exhaust systems to reduce nitrogen oxides and particulate matter	31-Dec-19	30-Sep-19	Complete ■
Assets □			
Concept design for the renewal of major assets starts	01-Dec-19	30-Sep-19	Complete ■
Mayor's Bus Driver Facilities – install permanent facilities on 42 routes	31-Mar-20	28-Feb-20	■

Milestone description	Plan date	Actual/ forecast date	Status
Public transport □			
Repairs to Blackhorse Lane Bridge - demolition of Blackhorse Lane Bridge begins	17-Aug-19	15-Apr-19	Complete ■
White Hart Lane Station Capacity Upgrade – existing station entrance demolition complete	27-Mar-20	24-Dec-19	■
Other □			
Technology and Data			
Enable pay as you go to support the Elizabeth line extension to Reading	08-Dec-19	08-Dec-19	■
Preferred bidder selected for rolling out a 4G network across all London Underground lines and implementing other connectivity improvements across London	31-Mar-20	31-Mar-20	■

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