

Transport for London investment programme report

Quarter 4 2017/18

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 (LU), London Buses, the DLR, London Overground (LO), TfL Rail, London Trams, London River Services (LRS), London Dial-a-Ride, Victoria Coach Station (VCS), Santander Cycles and the Emirates Air Line (EAL). 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 it opens, will add 10 per cent to 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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Introduction

This Investment Programme quarterly performance report provides an update on a range of projects that will deliver world-class transport services to London.

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

For each major project or sub-programme, the financial and milestone data represents the position as at quarter end. We include commentary for key achievements and progress in the quarter; the report also contains, as far as possible, updates on any notable progress post quarter end prior to publication.

For a sub-programme and project with a defined start and end, we include the forecast completion year, which is when it is planned to be substantially complete and in customer use. Works such as road resurfacing or track renewal that are delivered in a prioritised sequence are denoted as 'annual' as they are controlled and measured within each financial year.

Financial records of spend to date, authority and estimated final cost (EFC) are whole-life. This represents 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 in this report, authority has been given for the current stage of works and further authority will be sought when appropriate.

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 in line with the following key:

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 2017 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 in future 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 2017/18 budget milestones in line with the following key:

On time or early:



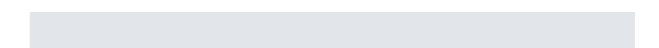
1-89 days late:



90 or more days late:



N/A (without 2017/18 budget milestones) are marked:



2017/18 budget milestones – the key milestones listed in the TfL Budget document – are detailed in Appendix A (page 86).



The Investment Programme includes a significant portfolio of work to deliver Healthy Streets

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

- Major Projects is responsible for our largest and most complex projects. It comprises the following areas: Line upgrades; Deep Tube upgrade; Network extensions; and Major stations, which are covered in pages 20–41 of this report. The Tottenham Court Road project is complete, has been handed over to operations and is therefore no longer reported. Schemes to be delivered by Major Projects in future (see page 41) will be reported in detail following authority approval
- London Underground comprises the following sub-programmes: Stations; Accessibility; Track renewals; Infrastructure renewals; Rolling stock renewals; and Signalling and control, which are covered in pages 42–55
- Surface comprises the following sub-programmes: Healthy Streets; Air quality and environment; Public transport; and Asset investment, which are covered in pages 56–73
- Other comprises the following sub-programmes: Technology and Data; TfL Growth Fund; and the Elizabeth line (including Crossrail), which are covered in pages 74–85

Mayor's Transport Strategy themes in this report

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

We are providing more trains on our busiest services, and opening the Elizabeth line to connect our city.

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

The Mayor's Transport Strategy themes that we are delivering through our diverse Investment Programme are indicated in this report as follows:

Healthy Streets and healthy people



A good public transport experience



New homes and jobs



The Mayor's Transport Strategy aims to reduce Londoners' dependency on cars in favour of walking, cycling and public transport



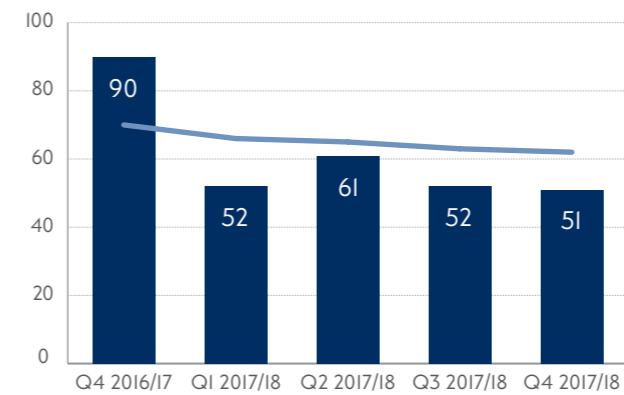
Operating our services to the highest safety standards is our top priority

Safety

The safety of our customers, employees and contractors is our core value. To keep London moving, working and growing, we work with a wide range of suppliers from across the UK and elsewhere to ensure they have the necessary culture and competence to safely deliver our capital investment and upgrade programmes. We are developing a tool to assess supplier performance and to identify and share good practices and areas for improvement.

Workforce safety

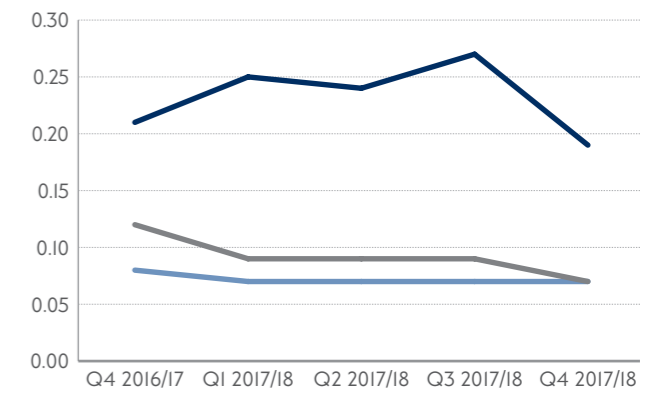
Workforce accidental physical injuries



- Major projects directorate (MPD)
- Cumulative trendline

There were a total of 51 accidental injuries to workers across our capital investment and upgrade programmes in Quarter 4, 2017/18. This is a 43 per cent decrease when compared to the same quarter in 2016/17.

Workforce RIDDOR incidents



- LU renewals and enhancements
- Crossrail
- Major projects

The RIDDOR* accident frequency rate (AFR) of Major Projects, London Underground and Crossrail fell sharply during the quarter.

The Four Lines Modernisation (4LM) programme has broken its own safety record by achieving more than four million hours without a RIDDOR reportable injury.

* Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013.

We are changing our safety culture by ensuring that our leadership teams are visible and by having safety conversations with the frontline teams. Our 'Making HSE personal' campaign has been promoted through senior manager safety tours – an opportunity to show that they care about the health, safety and wellbeing of their teams by visiting sites and engaging with employees. So far, we have seen a 43 per cent reduction in the number of injuries that led to employees taking more than seven days off work compared with last year but, crucially, this approach has made safety an important topic of conversation throughout the workforce. Our internal communications have also been used to further promote engagement and encourage safety conversations.

An important part of our Health Safety & Environment (HSE) management strategy is learning from incidents that cause, or could cause, injury or harm. Where any incident occurs on our infrastructure, the party accountable for the activity conducts an investigation. Incidents are reported to the relevant authorities where appropriate, as well as our own investigation. These actions identify the causes and contributory factors, as well as what needs to be done to prevent reoccurrence. This may include reinforcing safe behaviours through briefings to workers, revising

risk assessments and implementing new controls, or increasing safety messages to our customers and workforce.

We have developed the world's first Direct Vision Standard to objectively measure the volume of space around the cab directly visible to the driver of a heavy goods vehicle (HGV). This measurement is converted to a simple star rating from zero (poor) to five (excellent). We will implement a scheme that restricts or bans zero star-rated HGVs from entering London from 2020 and vehicles below three stars from 2024. We have released the star rating definitions to vehicle manufacturers and, in parallel, we are developing an operating model for the scheme.

Sandilands – tram overturning

We are continuing to address and meet the recommendations made in the Rail Accident Investigation Branch (RAIB) and SNC-Lavalin reports into the overturning at Sandilands.

Our thoughts remain with everyone affected. The Sarah Hope Line continues to provide help with counselling and other support.

We hosted a Trams Summit on 31 January and 1 February, which was attended by other UK tram operators and transport authorities, including

Transport for Greater Manchester, South Yorkshire Passenger Transport Executive, and Edinburgh Trams. This is part of our continuing work with the wider tram industry to learn every lesson, implement the RAIB's report recommendations, and introduce further measures that could improve tram safety across the UK.

We have also been appointed as a representative on the new UK tram industry body, which has been set up under the guidance of the Office of Rail and Road (ORR) to develop common standards and to address risk review and identification. We are working to apply the lessons of Sandilands across the organisation and will address and report on fatigue as a pan-TfL issue at future meetings of the Safety, Sustainability and Human Resources Panel.

Recent progress includes assessing options for track modifications, tunnel lighting and strengthening tram windows. The design of the iTram performance monitoring system is nearly complete and bid evaluation is under way for tram emergency lighting, with tender documentation being compiled for a system to physically prevent speeding.

Incident at Victoria station

In February 2017, a member of the public suffered life-changing injuries when they were struck by a failed architectural panel during high winds at Victoria station. A formal investigation report has been completed and lessons have been shared across our organisation, including Crossrail. This has resulted in new assurance regimes, particularly for hidden fixings, and changes in our design processes. The ORR also carried out an investigation and concluded that it is satisfied with the actions we have taken to prevent this happening again. As a consequence, the ORR has advised that it will take no further action.

Business at a glance

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

How the Investment Programme is managed



Investment Programme benefits



Trains run an hour on the Victoria line – a train every 100 seconds

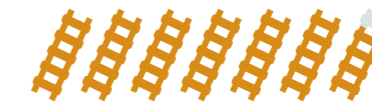
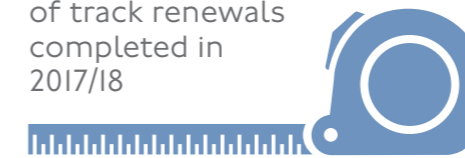
3,000



Hybrid buses in the entire fleet by the end 2017/18 (from 2,330 in 2016/17)

10,000m

of track renewals completed in 2017/18



680km

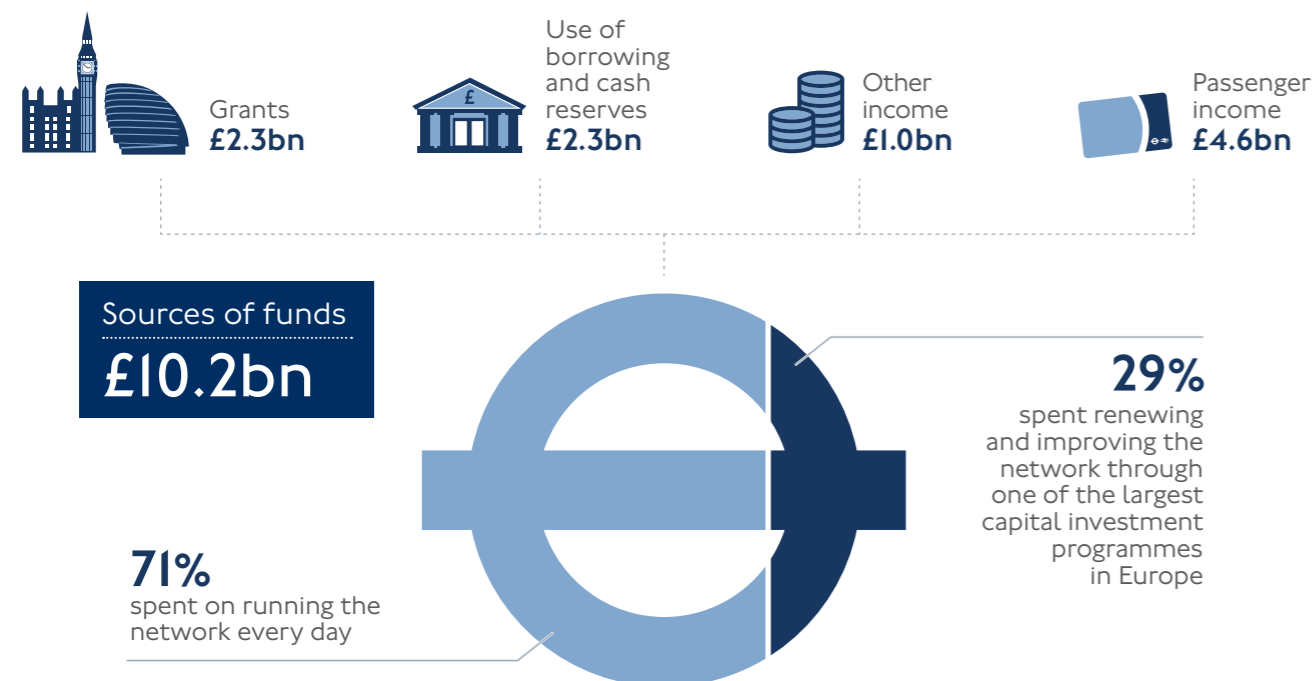
operated Rail and Underground routes

580km

operated highways



Finances at a glance*



*Based on full year 2017/18

Construction of the **4.5km** Barking Riverside extension is set to start in summer 2018



Tunnelling between **Battersea and Kennington**

completed as part of the Northern Line Extension, which is planned to open in 2020



Key achievements

Line upgrades

We completed the biggest test so far on the new Four Lines Modernisation signalling system in February. A further weekend of testing at the end of March allowed us to gather information to ensure the system is ready for safe and reliable passenger service later this year.

The new, state-of-the-art control centre at Hammersmith went live on 6 May, bringing all aspects of service control for the four lines under one roof. This helps to provide a smooth, integrated service and more accurate and up-to-date information for customers.

In January, we extended the evening peak service on the Northern line by one hour to improve the daily journey of hundreds of thousands of passengers.

Network extensions

At the new Battersea Power Station site on the Northern Line Extension project, we have completed excavation to the station base slab level and we are now constructing the internal structure of the station. At the new Nine Elms station, excavation to the base slab level is complete and work is under way to pour the station base slab and to install pre-cast station platforms. We have completed the signalling contract negotiations for the extension with Thales and detailed design has started.

We submitted our updated air quality assessment for the Silvertown Tunnel Development Consent Order (DCO) application to the Department for Transport at the end of January.

This air quality assessment confirms that the Silvertown Tunnel would not significantly affect air quality and would in fact result in a net reduction in exposure to air pollution for residents near the affected road network.

The DCO was granted on 10 May.

On the Barking Riverside extension, work to relocate the ramp and two overhead line structures, and demolish the redundant Ripple Lane diesel depot building was completed during possessions over Easter 2018. We issued the invitation to tender for the main works on 13 April.

Stations and infrastructure

On the Victoria station upgrade, we opened a new entrance and an enlarged south ticket hall in January as part of a project to double the size of the third busiest Tube station when it is finally completed this year. The new entrance at Wilton Road allows easier access to the south ticket hall and means that Tube customers no longer have to enter via the busy Victoria mainline station. The ticket hall, which is approximately twice as large as before, helps give customers a less congested and more pleasant journey through the station.

At Bank station, we have finished pouring the concrete to cap the piling for the new basement and we have completed the tunnel works for the new Northern line platform. We have installed new transformers and switchgear, and completed large cable pulls over two consecutive weekend platform closures.

LU track and civils

To make journeys smoother and more reliable, we have renewed more than 10km of track this financial year.

LU stations

In March, Bromley-by-Bow became the 73rd step-free station on the network with the introduction of two new lifts and manual boarding ramps. The station, which serves nearly four million customers every year, now has step-free access on both the eastbound and westbound platforms of the District and Hammersmith & City lines, making travel easier for disabled customers, buggy users, older people and those with mobility impairments.

Healthy Streets

We continue to construct Cycle Superhighway 6 North-South Phase 2, carrying out works during the Easter weekend to reduce the number of disruptive work days from 30 to four. We have also significantly extended the pedestrian crossing width at Cowcross

Street and Greville Street, with more than 8,000 pedestrians per hour expected to use the upgraded crossing at peak times.

We published the public consultation reports for Cycle Superhighway 9 (Kensington Olympia to Brentford) and Cycle Superhighway 4 (Tower Bridge to Greenwich) in February and March respectively, and we are now reviewing the feedback.

The first public consultation for the Rotherhithe to Canary Wharf river crossing project closed in January. It generated more than 6,000 public responses, 93 per cent of which supported the creation of a new crossing linking existing and planned cycle routes on both sides of the river. We appointed a new scheme designer in March.

We have identified an option to adapt our proposals for Fiveways junction in Croydon. This could save time and money by using the existing A23 road-over-rail bridge with an additional new adjacent bridge structure, minimising land-take requirements.

Following confirmation from the Mayor in support of the Vauxhall Cross bus station planning application, we received the final decision notice granting planning permission in February.

2017/18 Budget milestone performance summary

Air quality and environment

To support the growing number of Zero Emission Capable taxis and the increased use of electric vehicles, we have now installed the hundredth rapid charging point, as part of a new network across London.

Public transport portfolio

We completed two tramway track renewals during a planned Easter tram closure, which included replacing the rails, highway and associated components.

We delivered seven Cycle Hire extension sites (200 docking points) in Brixton in February.

Surface asset investment portfolio

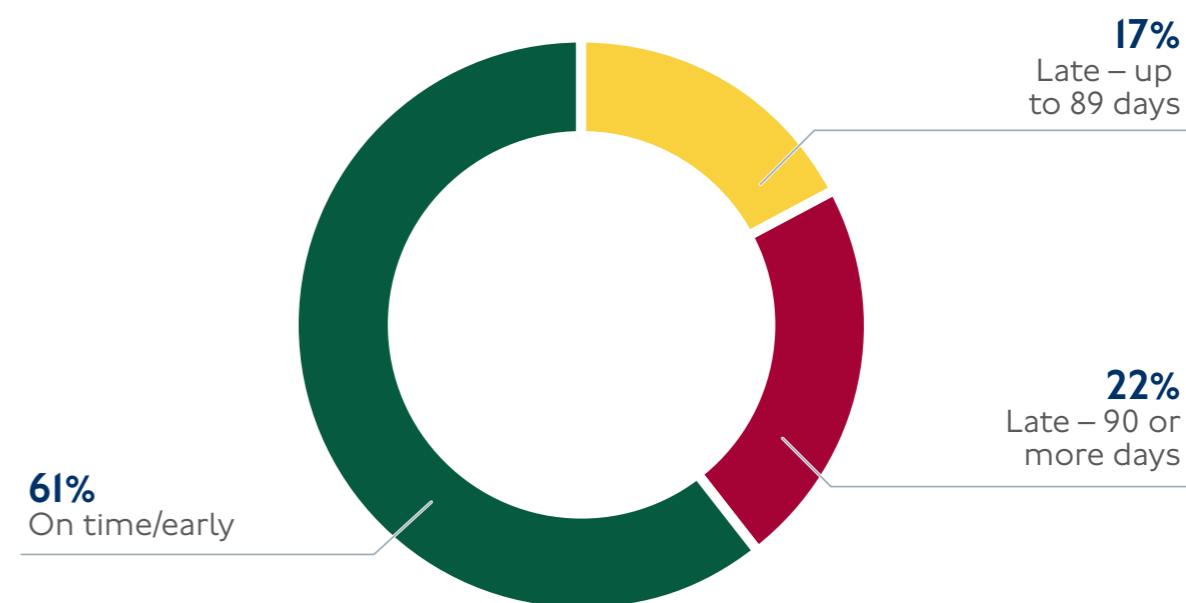
The bridge replacement at Highbury Corner is now substantially complete.

We have completed the refurbishment of Greenwich Pier, and reopened it to the public ahead of schedule at Easter.

Elizabeth line

Overall, Crossrail is nearly 93 per cent complete and Elizabeth line services remain on schedule to begin on the central section in December 2018. In February, another major milestone was achieved when the sub-station at Pudding Mill Lane was successfully switched on. This has allowed the testing of the new trains and systems in the tunnel section between Abbey Wood and Stepney Green to begin. A significant achievement took place on 13 April when testing started under full signalling control, with subsequent testing being undertaken in full automatic control and at speeds of more than 60mph.

The overall performance for all TfL 2017/18 Budget milestones is summarised as follows:



The late milestone scores of 22 per cent (90 or more days late) and 17 per cent (up to 89 days late) are explained in Appendix A.



The District line is one of four lines to benefit from new S-Stock trains

Major projects

Line upgrades 

Four Lines Modernisation (4LM)

Forecast completion year

2023

Spend to date (£m)

4,279

Spend authority (£m)

5,412

Estimated final cost (EFC) (£m)

5,244

EFC movement post plan (£m)

14

2017/18 budget milestone RAG^{1,2}



We have introduced 192 new S-Stock trains on the Circle, Metropolitan, District and Hammersmith & City lines, together with associated depot, station, siding and signal modifications to accommodate them. We have also been adapting three depots to support maintenance of the new trains.

The new automatic train control (ATC) signalling system will control train movements, allowing more frequent and reliable services. In addition to designing and installing the system, we are delivering related infrastructure works, and fitting S-Stock trains and engineering vehicles with the signalling equipment. The new signalling provides around 75 per cent of the programme's benefits and the new trains the remaining 25 per cent.

We continue upgrade works at Upminster depot, where we have built a new wheel lathe shed and have successfully undertaken integration testing. This will allow the new, longer trains to have all wheels maintained on the lathe where previously the depot could only maintain the wheels on part of the train before reversing it to work on the wheels of the remaining carriages.

We have completed demolition work at Ealing Common depot. We have also awarded the contract to rebuild the depot's gable end wall to improve structural integrity; this work is due for completion in July this year. The need for the work has further affected the 2017/18 milestone for the de-icing facilities, which will now be completed early in 2019

The EFC has reduced by £17m from £5,261m at Quarter 3 as a result of a number of scope reductions including the removal of redundant assets based on a revised strategy and saving opportunities on accommodation decommissioning costs at the Network Rail test track. Following a £3m increase against the Business Plan in Quarter 3, the EFC has now decreased by £14m.

- 1 The milestone RAG relates to in-year (2017/18) budget milestones, which are listed in Appendix A.
- 2 The 4LM programme milestones (detailed in Appendix A) were set at the earliest possible delivery date and are significantly ahead of those published at the authority stage (thus the amber RAG status). The programme is ahead of schedule and below budget against the original authority targets.

and, in part, drives the amber milestone RAG status. An additional cost of £2.5m for the gable end wall is included in the EFC and the Business Plan. We have installed interim de-icing arrangements to mitigate the delay and there is no extra cost for this as the works are integral to operating the depot.

Of the 76 planned platform modifications to reduce the gap between the train and the platform, 70 are complete. These modifications have reduced the number of incidents that can happen when customers get on or off trains. We are currently working at Victoria, Whitechapel and South Kensington stations, with Sloane Square and East Putney remaining.

Following the success of the new signalling system controlling S-Stock trains running automatic train operation between Hammersmith and Edgware Road in December, we extended testing to Euston Square in March. The section between Hammersmith and Latimer Road will be the first to be commissioned this summer, and will provide better, more accurate real-time customer information and improve reliability. The testing of seven-car trains was led from the new Hammersmith service control centre, which opened on 6 May. The next stage

of testing will involve the longer, eight-car Metropolitan line trains, and we will do further testing and validation in the coming weeks and months.

We have completed the testing of all new S-Stock trains at the Rail Innovation & Development Centre in Melton. Together with Bombardier and Thales, we have used this facility over the last 10 years to fit-out and test our new rolling stock. With this important milestone now achieved, we have started to demobilise our equipment.

We have fitted the ATC system to 82 S-Stock trains, meeting the requirement for 53 trains to be ready to use once we start to commission the infrastructure in the first migration area. We have installed ATC equipment on six engineering trains, work on the seventh has begun and we plan to complete all 50 by the end of 2019.

We have provided 16 Signal Equipment Rooms (SERs) across the network to Thales, to enable them to fit-out their new signalling system equipment. A further 25 are under way and we plan to complete all 46 SERs by September 2019. Thales' work has started on site at Acton Town and Barking, and those at Moorgate, North Harrow, Gloucester Road, High Street Kensington and Earl's Court have been made available to Thales.

Training for operations and maintenance staff on the Communication-Based Train Control railway signalling system has been completed. This is in preparation for the 'go-live' of the first migration area this summer.

Overall, the programme is ahead of schedule and below budget and authority, and we are mitigating issues to prevent an impact on targets. The in-year amber milestone RAG (which relates to the milestones detailed in Appendix A) also represents a reprioritisation of activities on the first migration areas that has delayed some of the later areas. When the plan dates for the milestones were set, we used a stretch target that sought to deliver timetable uplifts much earlier than planned when the programme was authorised, and to help minimise expenditure. We expect to deliver all the timetable improvements between six months to a year earlier than the dates committed to when the programme was authorised.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the 4LM programme submission to the Programmes and Investment Committee meeting in October 2017. Fifteen IAR recommendations were made and accepted, including 10 by the Independent Investment Programme Advisory Group (IIPAG). A quarterly update was provided to the Committee on 21 February. All recommendations are now closed. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

World class capacity

Forecast completion year

2024³

Spend to date (£m)

96

Spend authority (£m)

245

2017/18 budget milestone RAG⁴



Capacity work increased the Victoria line peak service from 34 to 36 trains per hour (tph) in May 2017. In January 2018, we extended the evening peak service on the Northern line by one hour.

We have completed infrastructure works to support the implementation of a new timetable on the Jubilee line that went live in May 2018. The new timetable extends a 30tph service in both peaks from the existing 60-90 minutes to at least 120 minutes (between West Hampstead and North Greenwich). These works include the timetabled use of the West Hampstead track reversing facility, train driver accommodation refurbishment at North Greenwich and essential upgrades to power supplies and cooling systems.

These works are helping improve the daily journey of hundreds of thousands of passengers. We are also continuing to invest in improving the infrastructure and train availability on the Jubilee and Northern lines. This will allow targeted improvements in service capacity to be made in the future.

Estimated final cost (EFC) (£m)

232

EFC movement post plan (£m)

(28)

Since the 2017 Business Plan, the EFC has increased by £28m to allow additional Service Optimisation packages for both the Jubilee and Northern lines. This will enable targeted improvements in service capacity to be made in the future.

³ This has been revised to reflect the deferral in our Budget document of the completion of some Northern line power enhancements works to 2023/2024.

⁴ The 2017/18 World class capacity (WCC) budget milestones (detailed in Appendix A) are no longer relevant, however we will deliver committed works to introduce new timetables. Revised milestone dates will be agreed once the full impact of the WCC residual works is confirmed.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the World class capacity submission to the Programmes and Investment Committee meeting in June 2017. A quarterly update was provided to the Committee on 21 February on the nine IAR recommendations that were made and accepted, including five by IIPAG. All recommendations are now closed. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.



An artist's impression of the new state-of-the-art trains to be brought in as part of the Deep Tube upgrade programme

Deep Tube upgrade programme

Deep Tube upgrade programme – design phase

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2018	83	154	113	1

2017/18 budget milestone RAG

The Deep Tube upgrade programme will provide more capacity on the Piccadilly, Bakerloo, Central and Waterloo & City lines. There will be new signalling systems and a fleet of newly designed, high-capacity, walk-through, air-cooled trains to replace some of the oldest on our network.

We completed the commercial evaluation for the new trains on 27 March. A bid panel review meeting was held on 29 March to formally agree the completion of the evaluation phase.

We have now awarded the contract to Siemens Mobility Limited to design and build 94 new-generation Tube trains, which will transform the experience of millions of Piccadilly line customers.

In parallel, we have prepared a submission to the Programmes and Investment Committee to seek authority to procure the first tranche of new trains for the Piccadilly line. Infrastructure

upgrades and enabling works to support the introduction of the new trains, to be delivered between 2023 and 2026, also form part of this submission. This first stage of the Piccadilly line upgrade will increase peak capability from 24 to 27 trains per hour. This submission was approved by the Programmes and Investment Committee post quarter end on 16 May.

On 27 April, the 'invitation to negotiate' was issued to three shortlisted bidders for the signalling and train control phase. This is expected to result in an authority submission in late 2019 to allow resigalling of the Piccadilly line.



The Northern Line Extension, from Kennington to Battersea Power Station, will help to regenerate the Vauxhall Nine Elms Battersea Opportunity Area

Network extensions

Northern Line Extension

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2020	* ⁵	* ⁵	* ⁵	* ⁵

2017/18 budget milestone RAG █

This project provides a twin-tunnelled extension from Kennington to a new terminus at Battersea Power Station via a new station at Nine Elms. This transport infrastructure is a catalyst for the regeneration of the Vauxhall Nine Elms Battersea Opportunity Area.

We have cast the concrete inverters on which the track in the two new running tunnels will be laid, and some initial sections of track have been installed. We have built three cross passages, each approximately 20-30 metres long, between the two running tunnels as a means of evacuation in an emergency.

We have removed the large, temporary enclosure over the Kennington Green shaft, which protected nearby residents from noise, dust and light pollution from the tunnelling works. The new headhouse and subway construction can now begin. We have poured the Kennington Green shaft base slab and have begun to cast its internal secondary concrete wall lining.

At the Battersea Power Station site, we have cast the station base slab and work is under way to cast internal columns and install cross beams and the pre-cast concrete platforms. The western core, which will house the lifts, emergency

stairs and other services, has been cast on top of the base slab. It is now nearing the station roof, which is the height of an eight-storey building. At the western end of the Battersea station site, we have built two 20-metre overrun tunnels.

At the new Nine Elms station box, work is under way to pour the station base slab and to install the pre-cast station platforms. Across all levels in the station box, the secondary concrete lining walls are being cast and we are encasing the columns in reinforced concrete.

Bank branch trains have not been stopping at Kennington since 26 May to enable vital Northern Line Extension works. This will continue until mid-September. We engaged with customers before the closure, which has proven to be very successful, with almost a third of customers using alternative routes. We will continue to monitor this over the coming weeks.

⁵ This information is withheld for reasons of commercial sensitivity.

Silvertown Tunnel

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2023	38	* ⁶	* ⁶	* ⁶

2017/18 budget milestone RAG 

We are providing a 1.4km twin-bore road tunnel under the Thames that connects Silvertown and the Greenwich Peninsula and which will relieve congestion at the Blackwall Tunnel.

Following the decision by the Secretary of State in November to defer the Development Consent Order (DCO) decision to May 2018, the Department for Transport (DfT) requested a new air quality assessment based on the latest available emissions evidence and modelling tools. We completed this at the end of January, and the report confirms that the Silvertown Tunnel scheme will not lead to a significant impact on air quality. The DfT then consulted on the findings and there was no substantive new evidence presented in the feedback. The Secretary of State granted the DCO post quarter end on 10 May 2018.

The procurement process continues as planned but, in February, one of the bidding consortia decided to withdraw. We remain fully engaged with the remaining two bidders and, as at the end of Quarter 4, we are finalising the contract documentation in line with the outcomes of the negotiations with the bidders.

We have started the additional geotechnical land and river surveys requested by the bidders to inform their designs and help reduce the uncertainty of the ground conditions. We expect the physical surveying works to be completed in summer 2018.

The land and works agreements are nearly complete.

Barking Riverside extension

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2021	20	* ⁷	* ⁷	* ⁷

2017/18 budget 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 allow our service to extend to Barking Riverside. Train services are planned to start in 2021.

In August 2017, the Secretary of State for Transport granted powers to deliver the Barking Riverside 4.5km extension and we plan to start the main construction works in the summer.

In February, Network Rail approved the Asset Protection Agreement that allowed the early works, initial demolition and site preparation work to start in the quarter. We successfully demolished a disused access ramp to Ripple Lane yard and relocated two overhead line structures during possessions of Network Rail infrastructure in March and at Easter. We completed the demolition works on schedule at the end of April.

Using authority delegated by Network Rail, we have reviewed all detailed design submissions and we issued the invitation to tender for the main works on 13 April.

The red 2017/18 budget milestone relates to a delay to the issue of the main works tender due, primarily, to some design complexities. However, we have reviewed the programme and identified opportunities to mitigate this delay, and the overall project completion date is not at risk.

⁶ This information is withheld until the main contract has been awarded.

⁷ This information is withheld until the main contract has been awarded.



A new entrance has been built on Wilton Road as part of the Victoria station upgrade

Major stations

Victoria station upgrade and finishes

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2018	560	660	584	1

2017/18 budget 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 will meet the needs of the 83 million customers who use the station each year.

After being closed for five years, the Victory Arch in the Network Rail station re-opened to customers on 25 January, together with a new entrance on Wilton Road and an enlarged south ticket hall.

We continue to rebuild the Duke of York public house, which was demolished to allow jet grouting works for the tunnels. The steel frame and floor slabs from basement to roof are complete and we are now rebuilding and restoring the new and existing facades.

We have completed the north ticket hall and provided step-free access to the Victoria line. The amber 2017/18 budget

milestone relates to the completion of step-free access by lifts to the District and Circle line platforms and Network Rail station, which was delayed by contractor lift resource issues. We continue to work with the contractor, who is managing this with its lift supplier to ensure adequate resources and appropriate management focus to deliver the remaining step-free access.

We are opening the new station in stages and we expect to open all new customer facilities this year, with overall completion planned for December 2018.

Bond Street station upgrade and water ingress

Forecast completion year	Spend to date (£m)	Spend authority (£m)
2017	308	308

2017/18 budget milestone RAG

We have increased capacity in preparation for the opening of the Elizabeth line. This includes new lifts for step-free access, more escalators and a new entrance to the north side of Oxford Street.

The enlarged station, with a new entrance and ticket hall, and step-free access from street to platform, was opened to customers in November. All assets have now been handed over.

Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
312	0

The EFC remains under pressure and we continue to seek a resolution on the final account with the main contractor.

Bank Bloomberg Place

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2018	51	58	58	0

2017/18 budget milestone RAG

Alongside the Bloomberg Place site redevelopment next to Walbrook, we are building a new entrance for the Waterloo & City line with connections to the existing concourse. The station box was constructed by Bloomberg on our behalf.

We have completed most of the protected wall panel installation in both lift shafts and have started to install it on the public stairs and escalators.

We continue to install the stainless steel decking and anti-fall measures to the four escalators before testing and commissioning will start. The new gateline within the new entrance has been installed, and fit-out and information management systems installation continue.

The entrance is now programmed to open in late 2018, which is reflected in the red 2017/18 budget milestone status.

There have been a number of issues with the manufacture and installation of the fire doors, which have resulted in delays. The delivery of the integrated systems that monitor and control the new station assets has also been delayed. We are working with the contractor to ensure the station will open on time.

Bank station capacity and systems integration upgrade

Forecast completion year

2022

Spend to date (£m)

372

Spend authority (£m)

640

2017/18 budget milestone RAG



We are increasing the capacity at Bank station, providing a quicker interchange for customers, a new Northern line southbound tunnel and a new entrance on Cannon Street.

We have completed the platform tunnel enlargement, and the running tunnel to the north has passed below both St Mary Abchurch (designed by Christopher Wren) and the Grade I-listed Mansion House without incident. We have started works on the new cross passages and we continue tunnelling on the new Northern line running and platform tunnels.

We have completed the new basement floor slab and we continue pile capping works for the new station box. We have installed two additional cement silos on the whole block site to serve the tunnel spray concrete lining operation.

Works to relocate the Central line high-voltage transformers also continue, with the new transformers delivered. We are installing the main high-voltage cables during two weekend closures. Significant cable diversion works are under way in the Northern and Central line platform areas in preparation for building the new connecting cross passages and concourse.

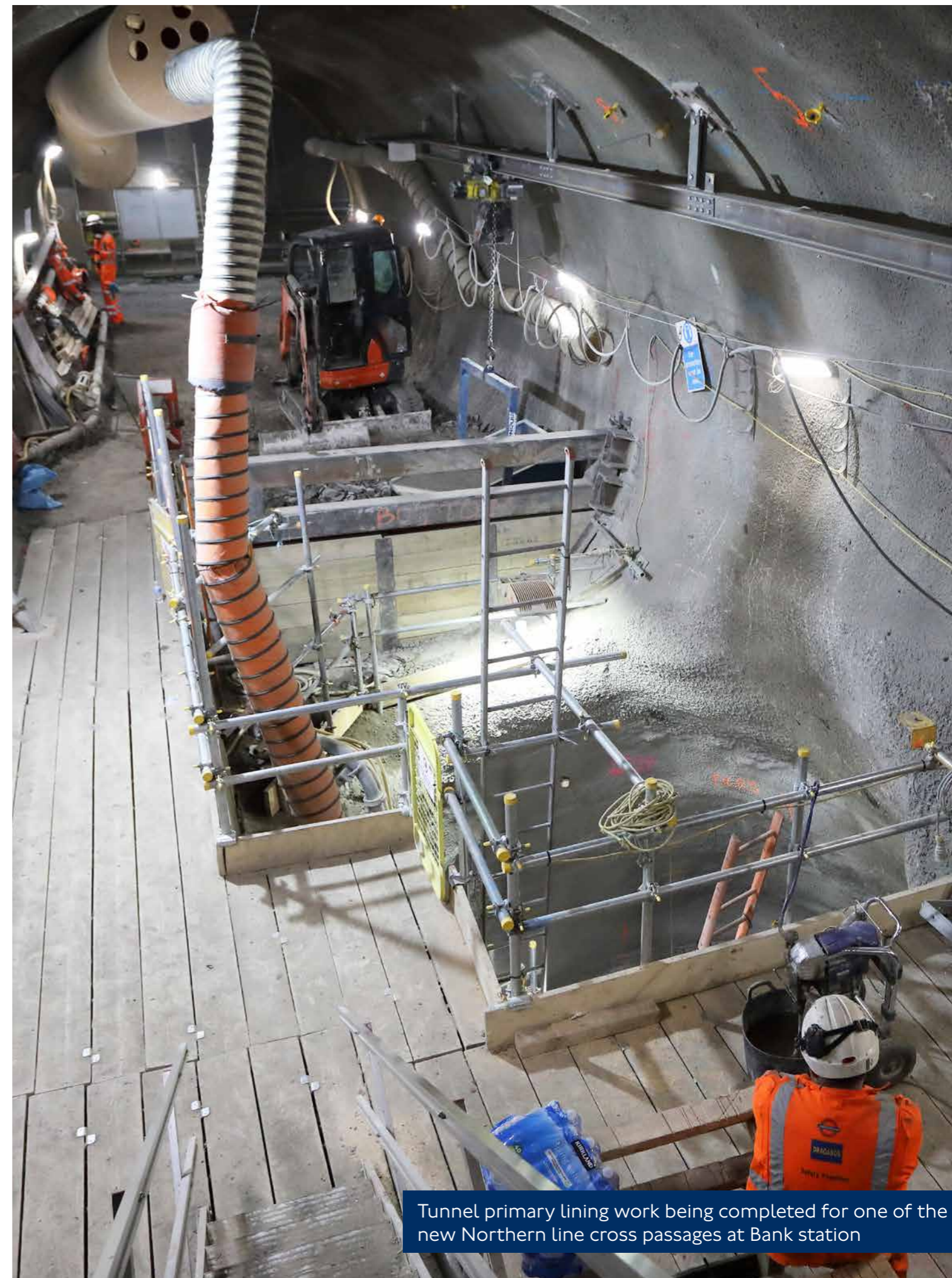
Estimated final cost (EFC) (£m)

655▲

EFC movement post plan (£m)

(13)

The increase in EFC of £13m is for the Systems Integration project. This is due to prolongation of the project, which has resulted in increased main contractor costs, internal labour and third party/PFI costs. The final account for the main contractor for Systems Integration is settled. The EFC for the Capacity Upgrade works remains under pressure as a result of risks on the project materialising. We continue to undertake a comprehensive EFC review that includes an independent review to determine the full extent of the cost challenge, including any potential opportunities and value engineering options.



Tunnel primary lining work being completed for one of the new Northern line cross passages at Bank station

Bakerloo line link (funded by Crossrail)

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2018	63	67	67	n/a

2017/18 budget milestone RAG



We are providing a new pedestrian walkway at Paddington to link the Bakerloo line platforms with the new Elizabeth line station, which is planned to open in December 2018.

We have completed the asset installation for the start of system integration and the final elements for the electrical and mechanical works. We continue to install the cladding panels, however there are issues with the supplier's progress which are being managed by the main contractor to ensure contract dates are met.

The amber 2017/18 budget milestone RAG relates to a delay to systems testing that was caused by technical issues with the pump station works. The milestone was achieved post quarter end on 30 April and there is no impact on the overall EFC and programme.

Through Crossrail, we are working with Sellar Property Group to agree the preparatory works it will undertake with the intention of demolishing the Royal Mail Group building. This building is used as the site offices for the Bakerloo line link.

Holborn station capacity

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2028	4	5	410	0

The proposed station upgrade will provide a new second entrance at the southern end of Procter Street, eight new escalators and three new lifts. This will make the station fully accessible and give customers more space to change between Central and Piccadilly lines.

Following the positive feedback received from the public consultation that closed in November on our proposals to improve capacity at Holborn station, we have developed the procurement strategy with our main contractors. We have drafted the strategy to take the project from concept design through to the Transport and Works Act Order application.

Camden Town station capacity upgrade

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2026	9	14	200	0

The station upgrade will provide a new fully accessible station entrance to the north of the existing station, connected by tunnels to the existing platforms, scheduled for completion in 2026.

We have completed the over-site development design ready for the planning application submission, which is supported by the London Borough of Camden.

To secure all the land required to build the project, we have purchased a property on Kentish Town Road and we continue negotiations on the purchase of Hawley Infants School.

We have drafted the procurement strategy to take the project from concept design through to the Transport and Works Act Order application.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Major stations programme submission to the Programmes and Investment Committee meeting on 21 February 2018. Fifteen recommendations were made and accepted, including nine by IIPAG. Seven are now closed and good progress is being made to close the remaining eight. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Future projects

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

Following the Government’s commitment to Crossrail 2 in the autumn 2017 Budget and the announcement of a review of the scheme’s costs, an Independent Affordability Review began in early February. Mike Gerrard, the former managing director of Thames Tideway Tunnel, was appointed to chair the review, which we jointly commissioned with the Department for Transport. With the support of a panel of independent advisors, bringing expertise and experience from across the transport, property, economic and business sectors, the integrated affordability review will examine ways of improving the affordability of the scheme by looking at cost and risk, funding and finance. An interim report will be submitted this summer that will provide the Mayor and Secretary of State with options to improve the scheme’s affordability. Following the review outcome and subject to a positive decision by the Government on an updated business case, we will move the project forward to the next stage and proceed with further formal public consultation.

The Bakerloo line extension from Elephant & Castle to Lewisham will increase the capacity and resilience of the transport network, reduce journey times and support at least 20,000 new

homes in the Old Kent Road Opportunity Area. Following our initial consultation response in mid-February, we are developing the route-wide concept design and plan to publish a further response in summer 2018.

The DLR rolling stock programme will replace rolling stock that is nearing the end of its design life and deliver 10 additional trains, providing capacity to meet the projected growth in the Docklands area. An extension to the depot at Beckton is required for the new trains, with further sidings, a new maintenance facility, and an extended automatic train operation (ATO) test track. Works to update the Thales ATO signalling system and strengthen the traction power system are also required. We issued the invitation to negotiate for the replacement rolling stock to four pre-qualified bidders on 17 November 2017 and we expect to receive bids in June 2018. We have completed the depot concept design. The project transferred to the Major Projects Directorate in April 2018.

The aim of the Rotherhithe to Canary Wharf river crossing is to provide a connection for pedestrians and cyclists in east London, improve sustainable travel choices and support economic growth. Refer to page 59 for further information.

London Underground

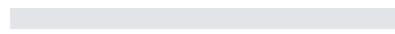
Stations 

Forecast completion year
2021/22

Spend to date (£m)
1,857

Spend authority (£m)
3,116

2017/18 budget milestone RAG



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

Integrated stations programme

We are making improvements to a number of stations, including five that will interchange with the Elizabeth line.

Work continues at Liverpool Street and Moorgate to ensure a consistent station environment across the Elizabeth line when it opens between Paddington and Abbey Wood in December.

At Sloane Square, we continue improvements, such as floor and wall tiling, and we upgraded external elevations in time for the Chelsea Flower Show in May.

At Charing Cross, improvements to the station operations room are complete.

We have completed the replacement of the canopy roof at Ealing Broadway.

Estimated final cost (EFC) (£m)
2,334▼▼

EFC movement post plan (£m)
(3)

The EFC, which covers all projects within the Stations programme that are planned until 2021/22, including existing projects and closed projects, has decreased from £2,604m at Quarter 3. This is mainly as a result of the Holborn station capacity and Camden Town station capacity upgrade projects and the Accessibility programme transferring out of the Stations programme to become a separate programme. The EFC has increased by £3m since the Business Plan mainly due to a reduction in the budget for future capacity projects, which is offset against increases primarily in the South Kensington station development and the Paddington capacity project.

Station capacity

Having completed the feasibility study for short-term improvements to address capacity issues at Stratford station, we are undertaking three new feasibility studies:

- Introduce an additional northern ticket hall entrance during events at the London Stadium in the Queen Elizabeth Olympic Park
- Relocate the western ticket hall lift to improve customer journeys through the station
- Construct a new entrance on Jupp Road to provide better access from the west

We are currently reviewing tender returns for the studies.

Civils (bridges, structures and deep Tube tunnels)

We have completed staircase replacement at Piccadilly Circus and Barons Court.

Earth structure works are close to completion between Chigwell and Roding Valley and we have started vegetation clearing between Grange Hill and Chigwell.

Collaborative enhancements and third-party projects

In March, Bromley-by-Bow became the 73rd step-free station on the network, with the introduction of two new lifts and manual boarding ramps.

At the Elephant & Castle, on the Northern line station capacity and accessibility upgrade, the developer has submitted a planning application for new housing and retail space. As part of the development, a station box in the basement of the structure would be built, and used to enlarge the existing station. We are developing the documents needed to engage with the developer once the London Borough of Southwark has made a decision.

At Paddington, we are planning to build a new entrance, increase the size of the ticket hall, improve access and provide step-free access to the Bakerloo line platforms. We will do this in partnership with Great Western Developments as part of its redevelopment of an adjacent building, which has been granted planning approval. It has started demolition works and we are preparing to begin concept design for the new station entrance.

The South Kensington station capacity upgrade listed building consent was granted by the Royal Borough of Kensington and Chelsea in January 2018. We have completed civils feasibility work and have started the concept design. We are also collating tender information for the design and build contract for the entire project.

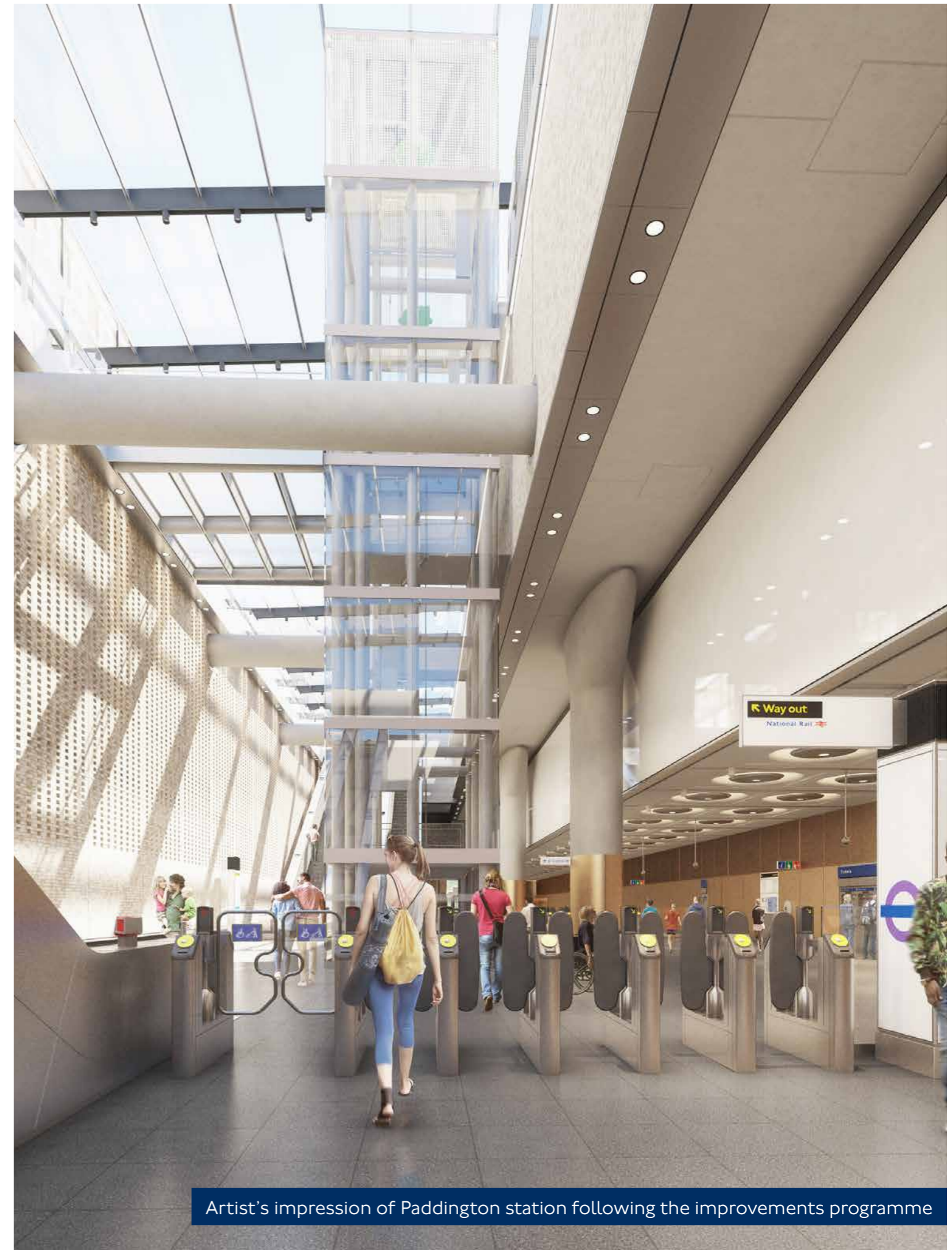
At Knightsbridge, we will provide step-free access and build two new entrances in partnership with a developer who will enable and part-fund the works. Following preparation of the Sloane Street entrance, we have handed it over to the developer to demolish it. Two new entrances will be constructed on Knightsbridge and Hooper's Court.

We continue to work on the redevelopment and upgrade at Tottenham Hale station. Works to non-public areas are under way following the relocation of staff facilities into temporary accommodation, and are due for completion in October 2018.

At Finsbury Park, as part of an upgrade to add capacity and provide step-free access, the southbound staircase has reopened to customers. This follows a period of closure during which the stairs were demolished and a new staircase installed.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Stations programme submission to the Programmes and Investment Committee meeting in June 2017. A quarterly update was provided to the Committee on 21 February on the 13 IAR recommendations that were made and accepted, including six by IIPAG. Six recommendations are closed and good progress is being made to close the remaining seven. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.



Artist's impression of Paddington station following the improvements programme



Customer accessibility is being improved, with a significant increase to be made in the number of stations providing step-free access by 2022/23

Accessibility

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2023	11	146	197	0

2017/18 budget milestone RAG

We are improving customer accessibility by significantly increasing the number of stations that provide step-free access. We will make 40 per cent of stations accessible by providing step-free access at a further 30 stations (38 in total with other programmes) by 2022/23.

We have announced the 23 stations that will be step-free by 2022/23 and plan to announce a further seven later this year. All of these stations are now being designed.

Buckhurst Hill became the 74th step-free station and the first to be completed under the programme in May 2018. Work will start at South Woodford later in the year.

The scheme at Harrow-on-the-Hill has received planning permission and demolition work continues on the platforms to prepare for the new lifts.

The first phase – to provide step-free access to all platforms and to the College Road side of the station – will be completed in early 2020.

Works continue on site at Newbury Park, where the lift tower steelwork is almost complete and cladding installation has begun. We have encountered some difficulties with the design, but the station is still scheduled to become step-free in October 2018. To improve the safety of our stations, we have installed ridged paving at the top and bottom of all staircases at a further 30 stations.

Track renewals

Forecast completion year

Annual

Spend to date (£m)

154

Spend authority (£m)

139

2017/18 budget 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 allow capacity increases.

To make journeys smoother and more reliable, we replaced 1.2km of ballasted track, 0.8km of drainage, one set of points and more than 1km of deep Tube track in Quarter 4. This brings the total of track renewed in the 2017/18 financial year to more than 10km.

We completed complex engineering work on the Piccadilly and Metropolitan lines. This included replacing more than 0.2km of track at Uxbridge, and replacing one and removing four key junctions as part of the track layout for the 4LM programme. We also replaced 0.2km of ballasted track between Gloucester Road and Earl's Court.

We replaced 0.14km of ballasted track and the level crossing on the Network Rail Link to the west of Ruislip depot. The height of the new level crossing now matches that of the surrounding road, providing a smoother journey for the road vehicles that use it. Within Ruislip depot, we installed new points and 0.16km of ballasted track using a tilt trailer for the first time. The tilt trailer will now be our preferred delivery method as it can transport complete track panels to site for greater installation speed and quality.

Estimated final cost (EFC) (£m)

154▲

EFC movement post plan (£m)

6

The EFC at year end is £6m more than stated in the Business Plan, mainly due to a business decision to accelerate drainage and reconstruction works. The EFC is £15m higher than the 2017/18 budget (authority) as a result of the above and the unrecovered cost of Transplant engineering trains, where the fleet has been used less than expected because of a reduced workload in the year.

To improve track drainage, increase track life and reduce maintenance on the Metropolitan line, we continued slab track installation in the northbound tunnel from Baker Street to Finchley Road.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Track renewals submission to the Programmes and Investment Committee meeting on 21 February 2018. Seven recommendations were made and accepted, none by IIPAG. Good progress is being made to close the recommendations. Project Assurance tracks progress against the recommendations made as part of its continuous assurance.

Infrastructure renewals

Forecast completion year

2021/22⁸

Spend to date (£m)

391⁸

Spend authority (£m)

762⁸

2017/18 budget milestone RAG



Our renewals programme for lifts, escalators, power and ventilation assets aims to improve safety, reliability, customer accessibility, journey times and the environment, while reducing maintenance costs. We are also increasing the generation and use of low and zero carbon energy.

Lifts and escalators

We have completed escalator refurbishments at Holborn, Westminster, Canada Water and North Greenwich, lift replacements at Chalk Farm, and Wembley Park train crew accommodation on time and within budget.

Works have started at Brixton to replace the two station lifts and to refurbish escalators at Charing Cross.

Power and energy

As part of the Mayor's pledge to make London a zero carbon city by 2050, we have completed the pump house steelwork on Islington's Bunhill scheme, where waste heat from the Northern line will be piped into homes. We are also implementing energy conservation measures, such as the installation of solar panels across suitable TfL buildings.

We have completed the pre-commissioning of the last transformer at Canada Water to support the introduction of a new timetable to the Jubilee line.

Estimated final cost (EFC) (£m)

562▼▼⁸

EFC movement post plan (£m)

38

The EFC has reduced by £38m from £600m at Quarter 2 across the Business Plan period, however the EFC of £928m for the whole programme until 2035 is unchanged. The reduction relates to the considered postponement of unapproved works into future (post Business Plan) years and the considered postponement of escalator and lift replacement works at Bank and Liverpool Street following an asset condition review.

We continue major tunnel ventilation system upgrade works at Park Square Gardens and Hay's Mews to reduce temperatures in tunnels on the Jubilee line between Baker Street and Green Park. We plan to complete these works in mid-2018.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Infrastructure renewals programme submission to the Programmes and Investment Committee meeting in June 2017. A quarterly update was provided to the Committee on 21 February on the 12 IAR recommendations that were made and accepted, including six by IIPAG. Eleven recommendations are closed and good progress is being made to close the remaining one. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

⁸ The figures represent the lift and escalator renewals (until 2021/22) and power and energy projects (until 2018/19).

Rolling stock renewals

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2029	165	612⁹	956⁹	(1)

2017/18 budget 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 a series of improvements to ensure continued reliability of the Bakerloo line fleet until its replacement by the Deep Tube upgrade programme. We have completed work involving structural (weld) repairs to carriages on 20 out of 36 trains and we expect to complete the full fleet by mid-2019. The red milestone RAG status relates to a delay to this project as a result of IR35, with the milestone being achieved post quarter on 18 April. We have introduced a more intensive work programme, with the necessary resource levels to deliver the project to the revised plan. We are carrying out a detailed cost review to ensure that any revised delivery improvement options can be verified and delivered. The project is on schedule to be completed by August 2019.

On the Central line improvement programme, the new traction package contracts are progressing on plan.

We have completed negotiations with two bidders for the saloon carriage CCTV contract, the standstill period completed without any challenges and we will award the contract shortly. The passenger information system contract for the Central line fleet is with the supplier for signing. We have developed the requirements for the prototype train, and the first train has been withdrawn from service for enabling and benchmarking work before prototyping starts.

We continue to consider delivery options to maximise efficiency, mitigate risks and deliver installation works by March 2023.

The twentieth refurbished Jubilee line train out of 63 is back in service. The refurbishments include an RVAR-compliant wheelchair area, new flooring, refreshed interior (including grab-poles and handles), plus sealing to the roof and windows to address water ingress issues.

Life extension work is complete on all 29 battery locos. Additionally, all locos have had diode modification to prevent motors failing when working close to the new S-Stock trains in regenerative braking mode.

Site works continue on the new train modification facility at Acton, which will be used for overhaul and heavy maintenance activities of rolling stock and engineering vehicles.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Rolling stock renewals submission to the Programmes and Investment Committee meeting on 21 February 2018. Eight recommendations were made and accepted, none by IIPAG. Good progress is being made to close the recommendations. Project Assurance tracks progress against the recommendations made, as part of its continuous assurance.

⁹ The spend authority is lower than the EFC as authority is sought in stages. £199m additional authority was granted by the Programmes and Investment Committee on 21 February, taking the total to £612m.

Signalling and control

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2021/22	n/a	142 ¹⁰	181	0

2017/18 budget milestone RAG

We are extending the life of our track-based signalling and control assets until they are replaced with train-based systems by either the 4LM or the Deep Tube upgrade programmes. This ensures that they can continue to support a safe, reliable and maintainable service until then.

On our signalling and control life extension works to the Central line, we have finalised the technical requirements specification and Project Assurance Plan and we are negotiating the NEC framework terms with Siemens. Works will be delivered in two phases, aimed at promoting cost certainty and delivery risk reduction. The first phase will deliver pilot scheme sites and a fully costed concept design, which will be implemented across the rest of the line in phase two.

We have awarded the contract for the supply and installation of hardware for the Bakerloo line to replace obsolete equipment and re-code the software into modern, supportable code that is compatible with the new hardware.

The new Piccadilly line signalling control system, which improves reliability and allows better monitoring and

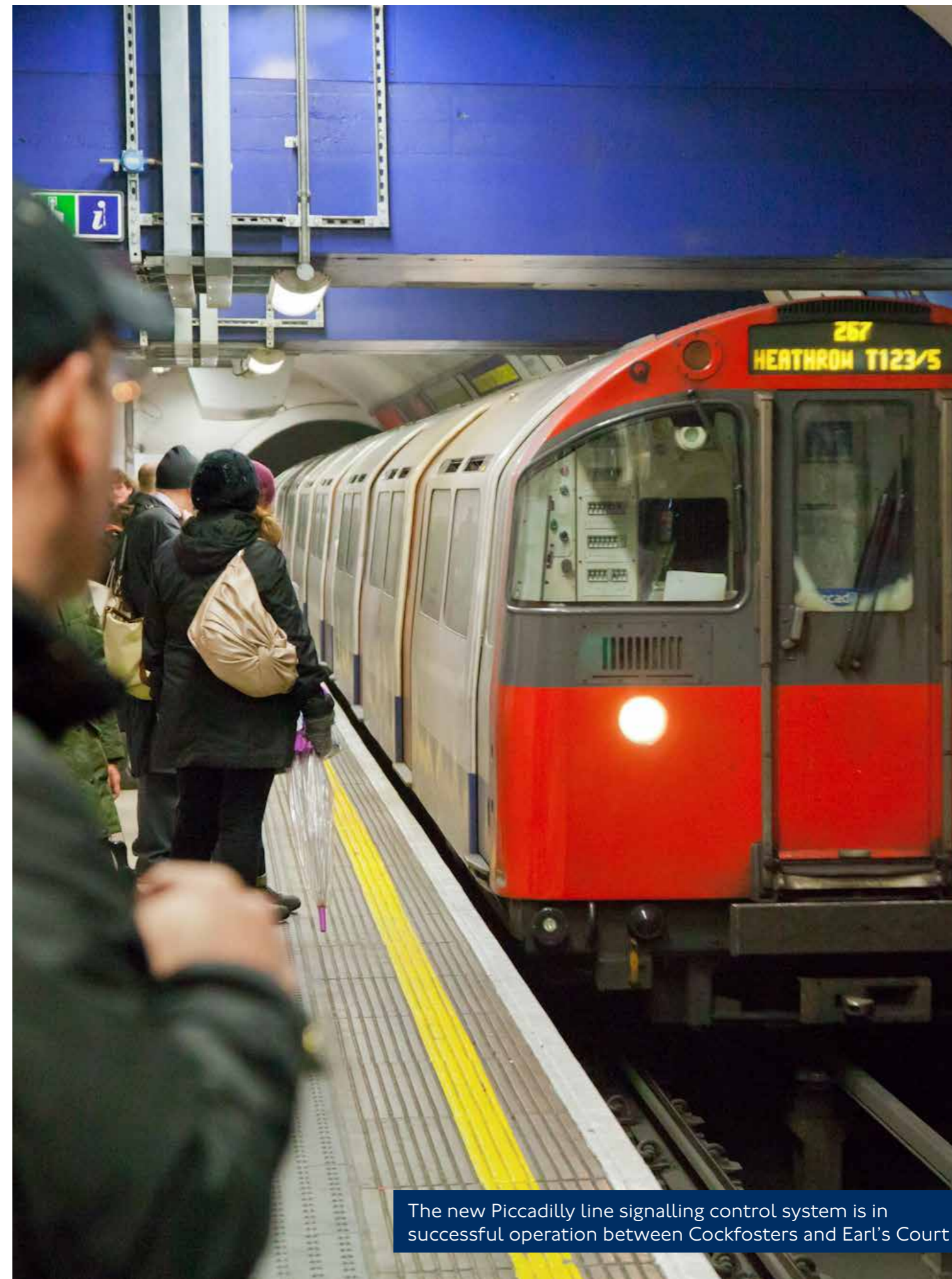
management of the service, continues to operate successfully between Cockfosters and Earl's Court. The last of the installation work on the Uxbridge branch is under way at South Harrow.

Phased commissioning at the new control centre in West London has begun and will be completed in early 2019.

We have finished construction works at the new control centre and the operations team are undergoing familiarisation and moving in.

We have completed the pre-tender documentation for the new signalling and control system for the Northumberland Park depot, and works information for the agreed procurement strategy is almost complete.

¹⁰ A total programme authority of £142m was approved by the Programmes and Investment Committee on 16 May. Spend to date will be reported from Quarter 1 2018/19, as there was no spend allocated this financial year against the authority granted. Further authority will be requested in future.



The new Piccadilly line signalling control system is in successful operation between Cockfosters and Earl's Court



Surface

Healthy Streets 

Forecast completion year
2021/22^{II}

Spend to date (£m)
209^{II}

Spend authority (£m)
439^{II}

Estimated final cost (EFC) (£m)
1,821^{II}

EFC movement post plan (£m)
(7)

2017/18 budget milestone RAG



The Healthy Streets Approach prioritises health and wellbeing, with the overall objective of delivering a transport system where more people can travel safely by walking, cycling or public transport.

Cycle Superhighways

We have completed the main works of the East-West Cycle Superhighway (CS3), and the final section opened in December. Minor finishing works will continue until summer 2018. The design work for North Carriage Drive within Hyde Park, which is not part of the main alignment of the route, is planned to start in the autumn, subject to approvals. Planning is also under way for the remaining resurfacing and anti-skid works at key locations, including Lancaster Gate, Buckingham Gate and Parliament Square. Works at Trinity Square (the section of CS3 de-scoped from the original construction build programme) are progressing well and we have agreed an accelerated programme with the key stakeholders in the area, aiming to reduce the overall construction programme by four weeks. Phase I of the works in this location, which include asset relocations and additional works to cut back the southern footway, was completed on 18 April. Phase 2, which incorporates works to the crossings at Trinity Square and Byward Street, began on 23 April following the London Marathon.

The EFC has increased from £1,814m at Quarter 3, mainly as a result of additional borough funding for 2018/19 as announced by the Mayor in Quarter 4.

Investment in Cycle Superhighways is an integral part of the Healthy Streets Approach

^{II} The forecast completion year and financials relate to the Business Plan period until 2021/22 and do not include any historic spend.

Delivery is progressing well on the North-South Cycle Superhighway (CS6) Phase 2. We have completed more than 50 per cent of the construction for both the Transport for London Road Network (TLRN) and borough sections. We launched new traffic signals at Charterhouse Junction, introducing a new pedestrian crossing at this busy junction. In collaboration with Crossrail, we extended the crossing width at Cowcross Street and Greville Street to 10 metres, with more than 8,000 pedestrians per hour expected to use the upgraded crossing at peak times. We also carried out works during the Easter weekend in collaboration with the City of London and 10 utility companies, which allowed us to reduce the amount of disruptive work days from 30 to four.

We published the public consultation reports for Cycle Superhighway 9 (Kensington Olympia to Brentford) and Cycle Superhighway 4 (Tower Bridge to Greenwich) on 27 February and 23 March, respectively. We are now reviewing the feedback and plan to publish our response to issues raised for both routes later this year.

We completed the concept design for the western section of Cycle Superhighway 10 (Kathleen Avenue/Western Avenue to Lancaster Gate) in late January following completion of buildability reviews, and detailed design is now under way. Concept design for the eastern section has also started.

Preparatory works started for Cycle Superhighway 11 (Swiss Cottage to the West End) in early May, following the local elections, with the main construction planned to start in July at Swiss Cottage.

Mini-Hollands

Twenty-six of the 103 Mini-Hollands schemes (98 infrastructure and five supporting measures) are complete. Six schemes started on site this quarter, including four Quieter Neighbourhood schemes in Enfield and two schemes providing connections across Kingston town centre. In total, 25 schemes are under way, including the Kingston Station scheme, the Lea Bridge Road scheme in Waltham Forest and the A1010 South scheme in Enfield. The Walking and Cycling Commissioner joined the London Borough of Enfield to launch the A105 Green Lanes scheme in March.

Central London Cycling Grid

We continue construction of the 85km network, with 50km complete or under way. Wayfinding has been introduced on 37km of this network across the City of London, the Royal Borough of Kensington and Chelsea, and the boroughs of Hackney, Islington, Lambeth and Southwark, and also in Hyde Park and St James's Park. In March, we launched Quietway 15 in partnership with the Royal Borough of Kensington and Chelsea, which runs from Belgravia to Earls Court.

As part of the future Grid programme, we are prioritising an additional 65km Grid routes for delivery, and we plan to take 39km through the initial design phase in 2018/19.

Cycling Quietways

Construction is complete or under way on 110km from a potential 250km network of routes. Wayfinding has been implemented across 17km of this network. To date, we have launched Quietway 1 (Waterloo to Greenwich and Greenwich to Bexleyheath), Q3 (Kilburn to Gladstone Park) and Q5 (Oval to Clapham Old Town). Construction is now under way on the following routes; a Quietway linking Barking Town Centre to Cycle Superhighway 3, Q14 along the Thames Path, Q22 along Newham Greenway, Q2 Notting Hill to East Acton, Q23 Ealing to Greenford, and the Greenwich to Kent House Quietway. Wayfinding signage is planned to be implemented on a further 45km during 2018.

Rotherhithe to Canary Wharf river crossing

This project aims to relieve existing transport links, encourage more active travel and support growth in the Canada Water and the Isle of Dogs Opportunity Areas by providing a cross-river connection for pedestrians and cyclists. The first public consultation closed on 8 January. It generated more than 6,000 public responses, 93 per cent of which supported the creation of a new

crossing which would link existing and planned cycle routes on both sides of the river. We appointed a new scheme designer, Atkins, in March following a competitive procurement process from our services framework. Atkins will help us to develop a single option for further consultation later this year, before a consents application in 2019.

Transformational programme

A planning application has been submitted for Westminster Bridge South to alter the landscaped area around the Park Plaza Hotel to allow a pedestrian link along Westminster Bridge Road. This will enable the conclusion of the scheme, which was substantially completed in December 2017.

We have completed consultation to remove roundabouts at Lambeth Bridge North and South, with a design that replaces the roundabouts with full signal-controlled crossings, including a safer junction for pedestrians and cyclists. Additional surveys have identified where some service diversions can be avoided through the design focus, saving time and money. The consultation has raised several issues regarding banned turns on the north side junction and we are working with stakeholders to find a solution.

We announced in March that we will proceed with proposals to change the existing gyratory system at Highbury Corner into a peninsular by closing the

western arm. Works are planned to start shortly and will take about one year to complete. The highway concept designs are due for completion this summer.

We continue to negotiate with landowners to secure the land required to deliver the Wandsworth gyratory proposals. We decided to postpone the submission to Board for the principle of making a Compulsory Purchase Order (CPO) to late 2018, which drives the amber 2017/18 budget milestone RAG. This will allow time to finalise the land negotiations and carry out highway survey investigations to increase cost certainty.

We have identified an option to adapt our proposals for Fiveways Croydon. This would avoid the need to buy some property and would use the existing A23 road-over-rail bridge (previously expected to be demolished), together with a new adjacent bridge structure, saving time and money. Significantly improved cycling measures are also included on the A23 as part of the revised option. A CPO to acquire the land essential to deliver the projects is expected to be submitted to Board in autumn 2019.

On 29 January, we received confirmation from the Mayor of support on the Vauxhall Cross bus station planning application. We received the final decision notice granting planning permission from the London Borough of Lambeth on 9 February.

Morgan Sindall, our main works contractor, is finalising the concept designs for the individual construction work packages for Old Street. The mechanical and electrical works will be the last work package to be completed by the end of June. Main works are planned to start in early 2019.

Bus priority reliability and growth programme

We delivered 51 bus priority schemes this quarter across London, bringing the 2017/18 financial year total to 188 schemes. This delivers a cumulative bus journey time saving of approximately 26 hours every day in the morning peak.

Safer Junctions

Design continues for improvements at key TLRN junctions and corridors, including the Purley Way/Mitcham Road and Camden Street/Camden Road junctions. We have delivered further improvement schemes, including on the A202 Camberwell New Road, at Flodden Road, and introduced cycle advanced stop lines at Chelsea Embankment. Site investigations and preliminary design work have started on the next phase of junction design at nine locations.

We continue to develop the detailed design for Charlie Brown's roundabout in South Woodford. Construction is planned to start during the school summer holidays in 2018.



An artist's impression of Highbury Corner following the improvements, which will change it from a gyratory system into a peninsular

Technology programme

We have selected a partner through a competitive procurement to deliver the new Real Time Optimiser system to manage London's road space more efficiently and effectively as demand increases. The contract details are being finalised. We are reviewing market responses for the Common Operational View and Incident Management System, and work continues on pilots to inform the development of the data roadmap.

Crossrail complementary measures

We are working with boroughs, Crossrail Limited and Network Rail to develop and deliver a programme of improvements to 17 stations in outer London that will form part of the Elizabeth line when the full service starts operating in December 2019.

Four stations (Romford, Chadwell Heath, Goodmayes and Manor Park) are complete and construction continues on the remaining 13 stations, which are at various stages of delivery.

Liveable Neighbourhoods programme

This new programme is a key part of the Mayor's Transport Strategy. It aims to deliver locally led, attractive, healthy and safe neighbourhoods that encourage a reduction in car journeys and an increase in walking, cycling and public transport trips. We are working with the London boroughs of Ealing, Greenwich, Hackney, Haringey, Havering, Lewisham and Waltham Forest to take forward their proposals and assess the feasibility of potential schemes. We are also meeting with London boroughs and partner organisations to discuss potential bids for the 2019/20 funding round, prior to submission of bids.

Local Implementation Plan programme

Construction of the final phase of the Baker Street Two-Way scheme is due to start in May, while consultation also continues at Stratford, Bond Street and Tottenham Court Road. Work to improve pedestrian access between Kingston's riverside, station and town centre is substantially complete at the site where the former Royal Rowbarge, Gloriana, will be permanently moored. Gloriana was built to celebrate the Diamond Jubilee of Her Majesty, The Queen in 2012. It now helps young and underprivileged people enjoy the river and the sport of rowing.

In Mitcham, bus priority has been improved through the town centre near Fair Green, and safer streets enhancements for pedestrians and cyclists have been made.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Healthy Streets submission to the Programmes and Investment Committee meeting in March 2017. A quarterly update was provided to the Committee on 21 February on the nine IAR recommendations that were made and accepted, including three by IIPAG. All recommendations are now closed. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Air quality and environment

Forecast completion year
2021/22¹²

Spend to date (£m)
44

Spend authority (£m)
202¹²

2017/18 budget milestone RAG



The Air Quality and Environment Programme reduces the impact of transport on air quality and climate change through a programme of measures targeted at vehicles in TfL's contracted and regulated fleets, and at all vehicles driving in London.

Ultra Low Emission Zone

From April 2019, the central London Ultra Low Emission Zone (ULEZ) will replace the T-Charge and operate in the same area, alongside the Congestion Charge. Unlike the T-Charge and Congestion Charge, which are only in place on weekdays, it will operate 24 hours a day, seven days a week, 365 days a year. In addition to the Congestion Charge, there will be two ULEZ charge levels: £12.50 a day for cars, vans and motorbikes and £100 a day for lorries, buses and coaches.

We have finalised the high level and functional designs for the ULEZ, and the detailed design is almost complete.

Our fleet compliance

We have now awarded 16 double-deck routes with Euro VI hybrid ULEZ-compliant buses, which will deliver more than 300 buses into service during 2018. We have also awarded three single-deck routes with zero emission electric buses, which will deliver more than 50 buses into service between 2018 and 2019 when the new route contracts start. Currently, there are approximately 2,000 ULEZ-compliant buses, both single and double deck, in service.

Estimated final cost (EFC) (£m)
434▲

EFC movement post plan (£m)
(13)

The EFC has increased by £13m from £421m at Quarter 3. The Hydrogen Bus EFC has now been broken down to reflect capital costs, third-party funding and operational savings post delivery, previously reported as a net figure, which has increased its EFC. The ULEZ EFC has also increased slightly following commercial negotiations with the contractor.

¹² Programme authority of £202m was approved by the Programmes and Investment Committee in October to reduce emissions from vehicles in London. It covers financial years 2017/18 to 2021/22. Further authority will be requested in future.

The red in-year 2017/18 budget milestone RAG relates to the Mayor's November 2017 announcement of an earlier introduction of the central London ULEZ from September 2020 to April 2019, which now requires all Euro V New Routemaster buses to comply with the Euro VI emissions standard. When the '75 per cent of the buses operating in the ULEZ will be compliant' milestone was set, all 306 Euro V New Routemasters were specifically considered to be ULEZ compliant. We are striving to achieve compliance with the Euro VI standard.

We continue to install NO_x abatement equipment on buses. The A12 Eastern Avenue and A21 Lewisham to Catford Low Emission Bus Zones are progressing, with 284 compliant vehicles now contributing significantly lower NO_x emissions on these corridors. The Haringey Green Lanes corridor is 73 per cent complete and the A3 Wandsworth St John's Hill corridor is 39 per cent complete. We are also retrofitting NO_x abatement equipment on buses on the A5 Edgware Road, Stratford, Uxbridge and Edmonton Seven Sisters Road corridors, in addition to vehicles operating in the ULEZ. More than 1,070 buses have been converted to date and these are directly delivering benefits for the Mayor's programme to improve air quality.

Ultra Low Emission Vehicles (Rapid Charge Infrastructure)

To support the growing number of Zero Emission Capable taxis and the increased use of electric vehicles, we are building a network of Rapid Charging Points (RCPs) across London.

We completed the 100th RCP on 16 March, two weeks ahead of schedule. The RCPs have been installed mainly on the TfL highway and land across 27 boroughs, with approximately half dedicated for taxi use. The Mayor launched the Southwark Street site on 19 March alongside the Deputy Mayor for Environment and Energy and the Deputy Mayor for Transport.

We continue to prepare sites for installation, and the number of live sites will increase to 150 by the end of December 2018 and to 175 by March 2019.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Air Quality and Environment programme submission to the Programmes and Investment Committee meeting in October 2017. Eleven IAR recommendations were made and accepted, including three by IIPAG. A quarterly update was provided to the Programmes and Investment Committee meeting on 21 February and progress is being made to close the 11 recommendations. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Public transport

Forecast completion year
2018/19

Spend to date (£m)
104

Spend authority (£m)
268¹³

2017/18 budget milestone RAG



We maintain the safety, reliability and performance of London Buses, London Overground, Docklands Light Railway (DLR), London Trams, Emirates Air Line, Santander Cycles and London River Services through prioritised renewals and enhancements that support growth, housing and jobs, and improve travel choices.

London Overground

Access For All (AFA) schemes are under way at West Hampstead and White Hart Lane stations. We are also acting as delivery partner to Crossrail to design and construct AFA schemes at seven stations across the eastern and western sections.

In preparation for the introduction of the new London Overground rolling stock:

- We have completed platform extension works on the Gospel Oak to Barking line
- We have installed 'correct side door' equipment on the Gospel Oak to Barking line, all West Anglia lines and the Romford to Upminster line
- Works are under way at Willesden depot following award of the contract to electrify the sidings

Estimated final cost (EFC) (£m)
456

EFC movement post plan (£m)
0

Value engineering reductions have been incorporated in the 2017 Business Plan, and we are finalising the embedment of the reductions. The EFC covers the five-year Business Plan period from 2017/18 to 2021/22.

¹³ Budgeted programme and project authority of £268m was approved during Quarter 3 by the Programmes and Investment Committee on 12 December to manage renewals and enhancements on Surface Transport's frontline customer services in 2017/18 and 2018/19.

We have installed the train protection warning system on the sections of the Euston to Watford line that are shared by London Underground and London Overground services. We will install the system on the Richmond to Gunnersbury branch to complete these works and allow us to interchange the fleet between lines and improve reliability across the network.

We continue to discuss a potential scheme at Hackney Central with the London Borough of Hackney, from whom confirmation of a land transfer is required.

Other live projects include lift maintenance at Wapping station, retaining wall renewal works on the East London line, new security for the Thames tunnel and a new hot train wash facility at New Cross Gate depot.

DLR

We have appointed a contractor to refurbish the CT30 shunter locomotive; the works started in April 2018 and are progressing well. We continue repairs to the kingpin/bogie mechanism on the B2007 vehicle fleet and are on schedule to complete these in July 2018.

We continue upgrade works to the Vehicle Control Centre to simplify the signalling borders around the central section of the railway. This removes conflicts that can occur when trains move from one section to another.

We have completed low-voltage renewal works in the new equipment room at Poplar and we have started works at Royal Albert and Pontoon Dock.

We have appointed contractors for drainage, bridge bearing, structural corrosion, noise barriers and station canopy drainage. Bridge repair works were completed at Abbey Road and fencing works continue, with one site at Canning Town remaining. We have finalised the technical specifications to provide systems that will allow the maintainer to work at height.

Radio resilience and public address system designs were submitted for acceptance and 50 per cent of the ticket-vending machines have been commissioned with new software.

At Limehouse station, the canopy, glazing and escalators have been installed and full testing of the escalators completed. Commissioning works remain before operational use can be granted.

At Custom House station, the roof and mezzanine beam installation is 85 per cent complete, and the paving is 95 per cent complete, with only the section between Crossrail and the DLR remaining. The mechanical, electrical and communications design approval is almost complete and we have started to install the cable management system.

We have started works on the London City Airport Visitor Centre and the structural designs have been submitted. We expect the works to be completed in late autumn 2018.

London Trams

This renewals programme consists of 17 projects across seven asset groups.

We installed new points controllers at New Addington, Arena and two at East Croydon in February.

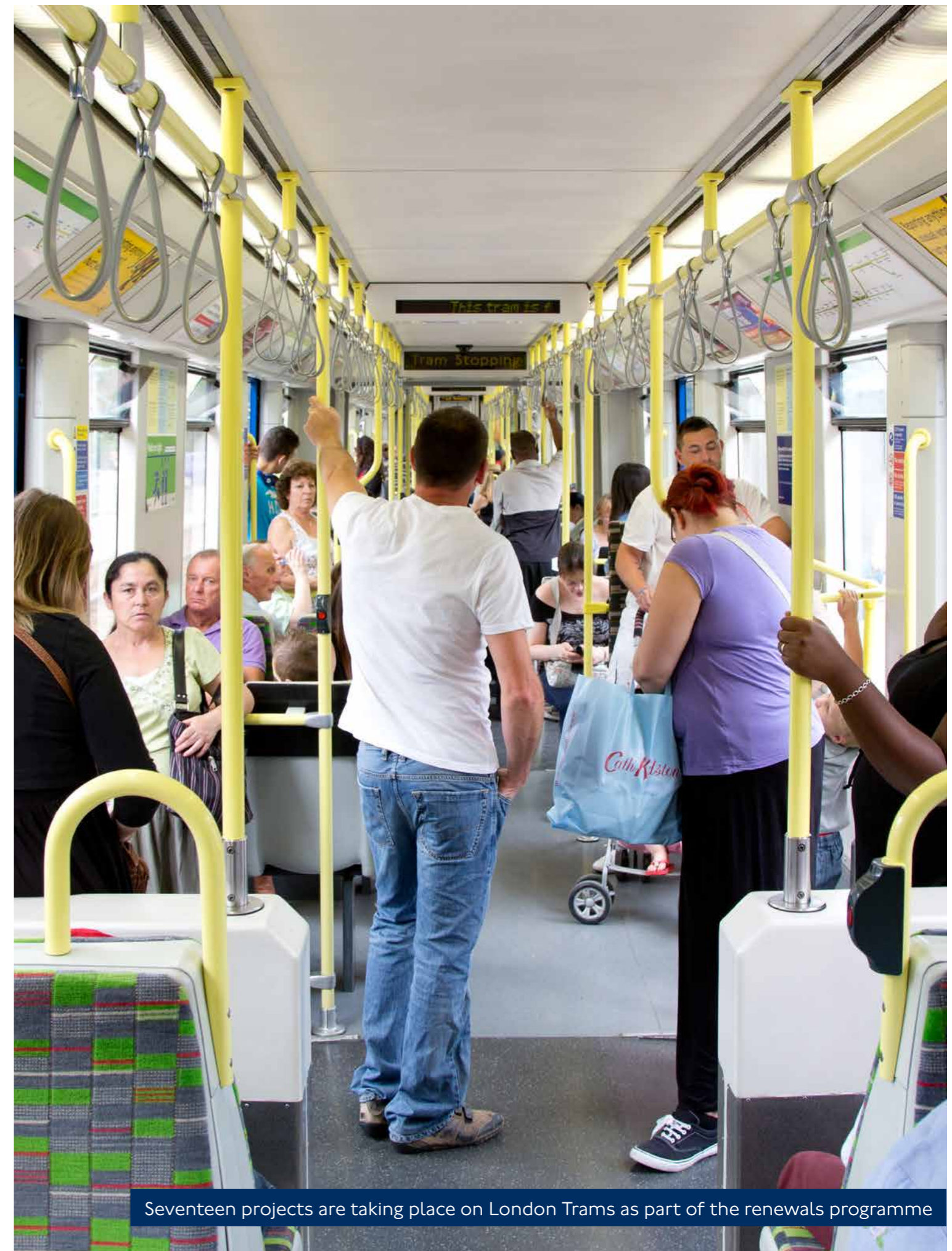
We have completed the overhaul of 23 Bombardier CR4000 trailer bogies and we continue to overhaul the vehicle hydraulic power units and brake callipers on this fleet.

We completed two tramway track renewals during the planned Easter tram closure, which included replacing the rails, highway and associated components. We began preparations to replace the parafil catenary support wires, which hold up the overhead power lines, during this closure. We also repaved three tram stops in Croydon town centre. We are rebalancing the power outage to evenly distribute the power supply in the Tramlink depot, which we plan to complete in August 2018.

As part of our commitment to make the tram network safer following the tragedy at Sandilands in 2016, we are continuing to address the recommendations from the RAIB. We have completed a number of initiatives and are now currently assessing options for track modifications, tunnel lighting and strengthening tram windows. The design of the iTram performance monitoring system is nearly complete, we are evaluating bids for tram emergency lighting and we have started the tender process for a system to physically prevent speeding.

Work is under way to improve the design of the Oyster card readers across the network to make it easier for customers to see and use them. Working in partnership with the tram operator, designs have been drawn up to provide additional validators and/or adjust or relocate the existing validators at a number of tram stops. Delivery of these improvements will be phased, starting early in the next financial year.

Following changes to funding for the Dingwall Road loop extension, we continue to review the preferred option to ensure affordability.



Seventeen projects are taking place on London Trams as part of the renewals programme

Network Rail completed the majority of its high-voltage cable diversion works in March during a weekend closure of the tram facilities at Wimbledon. A revised programme for completing the outstanding works is awaited from Network Rail.

We have completed the outline design for a package of improvements at Elmers End station to add a second tram platform and double-tracking. This will improve journey times, reliability and resilience across the tram network and the interchange with Network Rail services. We are preparing for procurement of a design and build contract. Issues with land acquisition are currently delaying the project. The project was granted full funding in January.

We have completed the outline design for the replacement of two Victorian bridges at Blackhorse Lane. We awarded the delivery contract to Morgan Sindall in February and detailed design/acquisition of utility diversion estimates is in progress. The works are planned to be completed in early 2019.

Sponsored services

The Cycle Hire renewals programme includes work streams such as payment software, on-street equipment, bike replacement, docking station relocation and map updates. The support contract

expires in November 2018. We have identified the desired replacement solution and have started the detailed design for the keypad and payment software. We delivered seven extension sites (200 docking points) in Brixton in February.

We completed cable renewals works to the Emirates Air Line during a planned maintenance closure in March.

Buses

The delivery of the new Routemaster fleet has been completed and all 1,000 are now in service, with 694 using the ultra low emission Euro VI and the remainder Euro V.

Testing is under way on the potential components of the Bus Safety Standard, including emergency automatic braking and measures to make bus interiors more forgiving if passengers slip or fall. The outcome will be a safety specification that will be incorporated into contracts from January 2019 to ensure compliance among new buses entering the fleet. Initial road trials for autonomous emergency braking were held in March and we are engaging with external stakeholders on the development of the remaining safety measures. We are planning a peer review of the safety measures, with vehicle industry experts chosen from an international pool.

The six bus operators who were allocated funding from the TfL Operator Safety Innovation Fund have all begun working on their safety trials, with the results expected in the autumn. The trials include fatigue detection devices and new methods of training drivers in safety.

We have also begun discussions with operators on understanding and addressing driver fatigue and are in the process of commissioning independent research into this issue.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Public transport submission to the Programmes and Investment Committee meeting in December 2017. Eight recommendations were made and accepted, none by IIPAG. Three are now closed and good progress is being made to close the remaining five. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

Asset investment

Forecast completion year

2021/22¹⁴

Spend to date (£m)

169

Spend authority (£m)

352

2017/18 budget 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.

Asset renewals programme

We resurfaced more than 77,000 square metres of road at locations including the A2 Shooters Hill and A406 North Circular Road (Brent Cross rail bridge to Golders Green Road), taking the total this financial year to more than 400,000 square metres. We also replaced almost 3,000 square metres of pavement including A3 Kingston Bypass, A1 Upper Street, A205 Christchurch Road and A503 Camden Road. All key milestones on our Capital Renewal Programme were achieved on time, with the exception of Vehicle Restraint Barriers.

We replaced 22 signalled junctions in the quarter, including upgrades to two junctions that interface with Croydon Tramlink. We installed new bus driver facilities at Molesworth Street and Camden Road, and we refurbished mess rooms at Hackney Wick and Hatton Cross bus stations.

Other works included street lighting renewals at the A20 Sidcup Bypass and Victoria Embankment, structural works at Great Chertsey Road and lighting works in Eltham Tunnel.

Estimated final cost (EFC) (£m)

631¹⁴

EFC movement post plan (£m)

3

2018/19 is the first year without any Government operating grant. As a result, the programme of proactive capital renewals on the road network has been stopped in the short to medium term, although the safety of the network will be maintained. The EFC decrease of £3m in Quarter 4 reflects a reduction of works in 2017/18 in advance of this cessation. In the medium to long term, new and sustainable funding sources for London's roads will need to be identified.

We have completed the refurbishment of Greenwich Pier ahead of schedule and reopened it to the public for the Easter holidays.

Structures and tunnels investment programme

On the three road-over-rail bridge replacements that are under way from our programme of major works to address high-priority risks, we:

- Completed the final phase of demolition of the existing Power Road Bridge during a railway possession (but maintaining traffic flow on the A406) over the Easter weekend. We will build the road approaches to the new section of the bridge and plan to open all four lanes later in 2018
- Remain on schedule to finish the final works at Highbury Corner, which are now substantially complete following the successful possession and works over Christmas and the New Year
- Are focusing works on the demolition of the second section of bridge at Ardleigh Green during road and rail possessions in May and June 2018

River schemes

Construction of two replacement vessels for the Woolwich Ferry is progressing well. Construction of the new berths and mooring infrastructure will begin in the summer and we remain on schedule for the new vessels to enter service later this year.

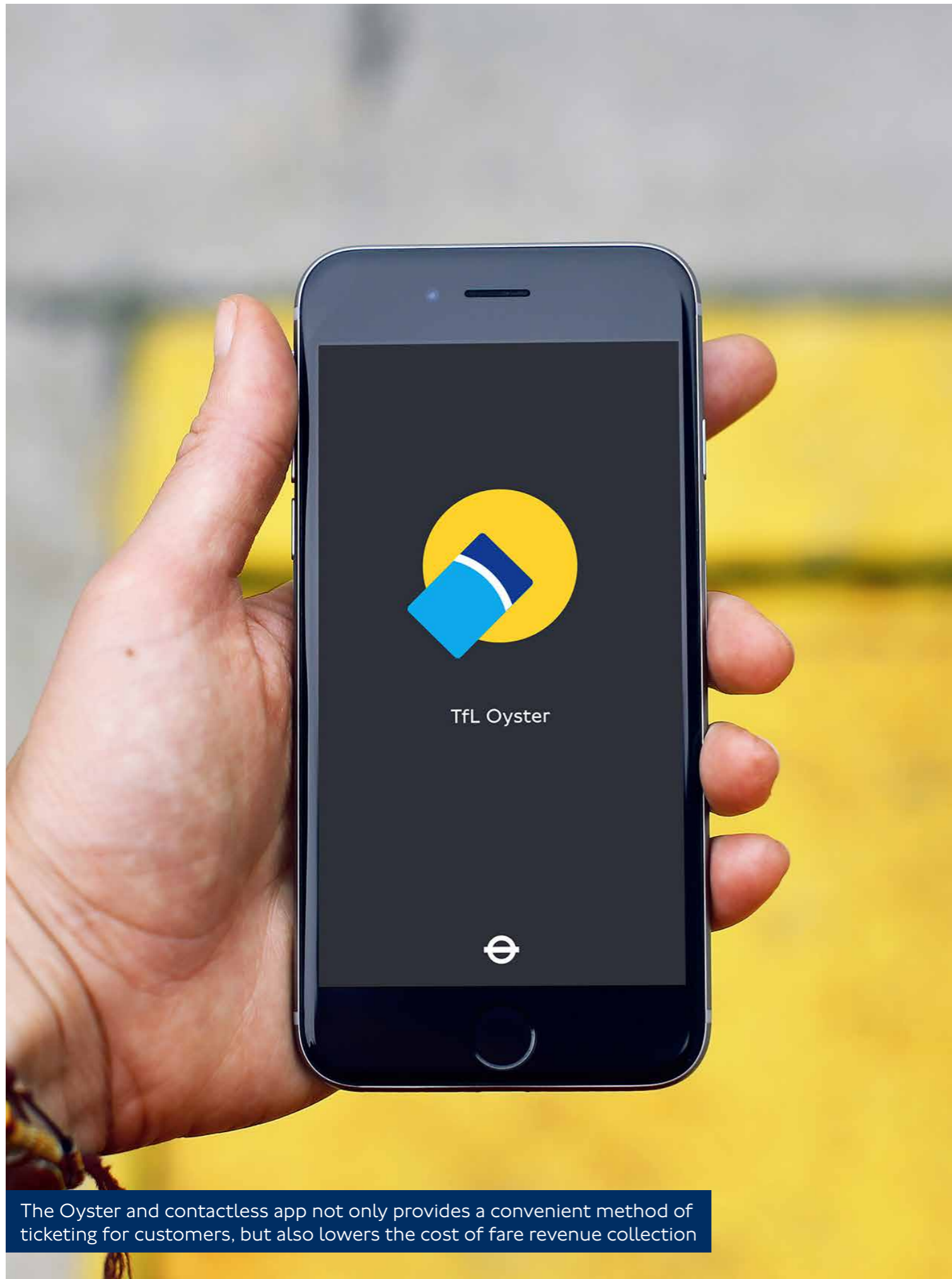
Coaches

We continue to develop proposals and feasibility works for new coach facilities, and work proceeds to replace the roof glazing at Victoria Coach Station as part of our maintenance of the existing station.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Asset investment programme submission to the Programmes and Investment Committee meeting in June 2017. A quarterly update was provided to the Committee on 21 February on the 10 IAR recommendations that were made and accepted, including five by IIPAG. Eight recommendations are closed and good progress is being made to close the remaining two. Project Assurance tracks progress against the recommendations made (including by IIPAG) as part of its continuous assurance.

¹⁴ The forecast completion year and EFC relate to the Business Plan period until 2021/22.



The Oyster and contactless app not only provides a convenient method of ticketing for customers, but also lowers the cost of fare revenue collection

Other

Technology and data

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2019/20	n/a¹⁵	168	168	0

2017/18 budget milestone RAG

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

Payments

In January, we successfully launched the extended Hopper fare, which allows passengers to make unlimited bus and tram journeys within an hour.

With more than 800,000 purchases to date, the Oyster and contactless app has made ticketing more convenient for Oyster customers, while reducing fare revenue collection costs. We extended the app to contactless customers on 15 June 2018. We are also testing the revenue allocation systems to support weekly capping for adult Oyster users and we remain on schedule to launch this later in 2018.

We have finalised arrangements for Oyster pay as you go to be accepted on the Heathrow Connect service now that TfL Rail has taken over responsibility to support Elizabeth line services from 20 May. We continue to support Heathrow Express to accept pay as you go on its services later this year.

Seventy-five new ticket vending machines have been formally accepted into service. These machines integrate full National Rail and Oyster functionality, meaning customers will only have to use one machine.

¹⁵ Total programme authority of £168m was approved by the Programmes and Investment Committee on 16 May. Spend to date will be reported from Quarter 1 2018/19 as there was no spend allocated this financial year against the authority granted.

Enterprise resource programme

We plan to move away from expensive investment programmes every five to eight years towards the upgrading of our desktop hardware/software with a more 'evergreen' (continual enterprise resource programme refresh/update) model. This will lower our overall total cost of ownership and reduce operational risks associated with technology obsolescence. It will also support our Smart Working initiative and enable employees to work more flexibly. Key achievements in the quarter are:

- Desktop modernisation – current state review carried out to determine priority areas of focus to ensure the future desktop meets the needs of the business
- A directional mix of 'thin client' versus laptops agreed to ensure that we support bona fide mobility needs as well as leveraging the existing 'thin client' connectivity for the majority of office users. A detailed plan of which devices need to be replaced is now starting
- Office 365 productivity software – programme team established, with prerequisite technology implementation to be complete by June 2018

- Phased migration of all users to Office 365 desktop suite will follow throughout 2019
- A migration of mobile device management software to Microsoft Intune has started, with completion due by November 2018 to realise the savings in the Business Plan
- Multi Factor Authentication software is now in production, replacing the RAS token fobs for remote connectivity to the TfL network. User migration is planned to be completed by the end of the calendar year, delivering cost savings and user satisfaction improvements
- A User Adoption workstream has been created, and through this we are developing an approach for future updates to be delivered more frequently, and to be clearly coordinated and communicated (eg via early adopters/champions) in each business area

Asset management products

We are continuing to reduce the total cost of ownership of our asset management systems by reducing the complexity of our technology through consolidating similar products.

Work is under way to build internal capability to reduce our dependence on expensive third-party services and deliver new business requirements.

Asset and network management products

Work is under way to upgrade the track access control system, a booking system for workers who carry out LU track maintenance at night. We will refresh the code and renew the infrastructure and hardware.

Bus operating and monitoring systems

The Surface narrow band radio contract was signed on 23 March to replace the life-expired bus radio system. We have started to install infrastructure at a pilot testing location.

We have completed outcome definition work to replace our bus tracking, performance management and real-time bus passenger information system on the next generation of iBus. We have completed consultation with bus operators and wider stakeholders, and feasibility studies are under way.

We are working with the preferred supplier to reach an agreed contract to replace life-expired current bus route and schedule systems.

Hosting – data centre rationalisation and cloud migration

Hosting is how we organise, process, store and distribute large amounts of data. Work is under way to reduce the cost of hosting by reducing the size of our primary data centre by two thirds.

We continue to develop a hybrid hosting operating model, in which we have extended our data centre core capabilities into the public cloud (AWS and Azure). Further expansion of these capabilities is under way to deliver stronger governance, operational controls and cost transparency to yield additional efficiencies.

With the successful pilot migration of four applications from On-premise to the Public Cloud and the build out of the enterprise service hub for the management of these services, we have implemented the foundations of a centralised Hybrid Hosting operating model. Future expansion of these capabilities is under way, which will deliver stronger governance, operational controls and cost transparency to bring about further efficiencies.

Cyber security

The UK is implementing the European Union (EU) directive on the security of Networks and Information Systems (known as the NIS Directive). In response to this, we have set up a working group with the Department for Transport and the National Cyber Security Centre.

Technical refresh and Technical Service Operation

Technical Service Operation (TSO) provides suitable information technology services and applications, some of which are vital for our day-to-day operations, and investment to refresh our data centre servers.

We have completed a detailed review to understand business critical services and prioritise the expected level of resilience. Our next step is to identify the gap between the current level and the expected level.

Work is under way to replace, through a competitive tender, two major outsourced contracts that will end by June 2019. We have finalised the procurement strategy and business case, and defined the requirements. The contractual documents are being finalised and we plan to go to market next quarter.

Data and analytics

The General Data Protection Regulation (GDPR), a regulation in EU law on data protection and privacy for all individuals within the EU, came into effect on 25 May. The enhanced requirements set out how organisations treat the customer and employee data that they hold. We are working with representatives across our business to update processes and systems.

We have gathered requirements for self-service reporting capability and we are preparing to launch a procurement exercise to select a suitable enterprise tool.

Networks

In December 2017, we signed a new contract with Capita to consolidate our above-ground network spend and deliver a standardised, simplified and more affordable network infrastructure. Preparation is under way to ensure a low-risk transition from the incumbent provider to Capita in early August, after which the transformation work will start.

We are also working to deliver WiFi services on the Elizabeth line train fleet in time for the planned opening in December 2018.

Contact Centre operation

We have begun the process of re-tendering the two contracts for Contact Centre telephony services that meet TfL's customer self-serve and helpline requirements, the latter expiring in mid-2019. We are engaging the market to understand potential industry developments and investigate if savings could be made by combining these into a single contract.

On 14 November 2017, we awarded the contract to Novacroft to provide the Oyster concessions service from January 2019 for a minimum of five years. Novacroft will provide a full Contact Centre and card production service at a reduced rate in comparison to the previous contract and also at a significantly lower cost than if we managed the service.

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Technology and data submission to the Programmes and Investment Committee meeting on 21 February 2018. Eleven recommendations were made and accepted, including seven by IIPAG. One is now closed and good progress is being made to close the remaining 10. Project Assurance 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)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2021/22	n/a ¹⁶	200 ¹⁶	200	0

2017/18 budget milestone RAG 

The programme allocates funding to support the delivery of 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 the delivery of 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 (on the 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 Greater London Authority (GLA).

Sutton Tram extension

A detailed option selection process is under way and we have identified a shortlist of potential options. We will assess these in detail ahead of a public consultation planned to start in the autumn, which will inform a preferred option. Subject to confirming a full funding package, we plan to submit a Transport and Works Act Order application by early 2020.

Rotherhithe to Canary Wharf Crossing

Following the positive results from the consultation that closed in January, we are developing a more detailed design for further consultation later this year, prior to a consents application in 2019. More detail on this project is on Page 59.

Shortlisted schemes

We made recommendations to the Programmes & Investment Committee in December to make a contribution to support four schemes that met our agreed criteria. These schemes are:

- An upgrade at Elmers End station to provide double tracking, and a second platform to support growth along the Tramlink network
- 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

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

Assurance

Project Assurance completed an Integrated Assurance Review (IAR) on the Growth Fund submission to the Programmes and Investment Committee meeting in June 2017. A quarterly update was provided to the Committee on 21 February on the IAR recommendations that were made and accepted, including four by IIPAG. Six recommendations are closed and progress is being made to close the remaining five. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

¹⁶ Programme authority of £200m was approved by the Programmes and Investment Committee on 28 June. There has been no spend to date (up to Quarter 4 2017/18) against this authority. Funds are allocated from Quarter 1 2018/19 onwards and will be reported from then.



Elizabeth line trains are in operation, with the line to be opened fully in December 2019

Elizabeth line

On-network stations improvement programme

Forecast completion year	Spend to date (£m)	Spend authority (£m)	Estimated final cost (EFC) (£m)	EFC movement post plan (£m)
2019	41	94	94	0

2017/18 budget milestone RAG

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

On the Great Eastern section step-free schemes (Maryland, Manor Park and Seven Kings), we have installed all the main steelwork and started the fit-out stage. Lift installation is under way at Maryland and Manor Park. Completion of all three sites is expected in summer 2018.

On the Great Western section lift schemes (Hanwell, Iver, Langley and Taplow), design works are progressing. Construction will start in summer 2018, with all four schemes due to complete in time for the full opening of the Elizabeth line in December 2019.

MTR is continuing its station refurbishment programme. Works to repair and decorate platform canopies at Chadwell Heath, Goodmayes and Ilford are substantially complete and focus is now on the roll-out of new platform shelters and seating. Work will also begin in the summer to refurbish the station buildings on the Great Western section that are not being upgraded by the Crossrail project.

Rolling stock

Forecast completion year

2019

Spend to date (£m)

735

Spend authority (£m)

1,149

Estimated final cost (EFC) (£m)

1,017 ▼▼

EFC movement post plan (£m)

120

2017/18 budget milestone RAG



We are introducing the new Elizabeth line train fleet in phases by December 2019 and building a depot to provide train maintenance facilities.

A number of new Class 345 trains are now operating on the service between Liverpool Street and Shenfield, as well as between Paddington and Hayes & Harlington. The introduction has been later than planned and is represented by the red 2017/18 milestone RAG. The delay was mainly due to train signalling issues. We have therefore delayed the withdrawal of the old train fleet to continue to provide a full passenger service.

The main train maintenance building at Old Oak Common depot and the connection to the rail network were energised in January 2018 to complete testing. The depot was brought into operation on 1 March 2018, providing capacity for nine trains. The first six of 33 additional sidings in the depot yard were energised and opened on 11 April 2018. Class 345 trains are now operating daily from the depot for driver training in preparation for the second stage of service introduction in May 2018.

Dynamic testing of the Class 345 European Train Control System, needed for operation to Heathrow Airport, started in the Heathrow rail tunnel in January 2018. Dynamic testing of a Class 345 train and the new automatic train control system in the new Elizabeth line tunnels began in February 2018.

The spend authority increase from £1,137m at Quarter 3 relates to an additional train required to extend the Elizabeth line service from Maidenhead to Reading. This train is fully funded by Crossrail Limited. The EFC has reduced by £120m this quarter, mainly because of a plan to sell and lease back the new rolling stock fleet.

Crossrail

Forecast completion year

2019¹⁷

Spend to date (£m)

Spend authority (£m)

14.8

Estimated final cost (EFC) (£m)

EFC movement post plan (£m)

2017/18 budget milestone RAG



The Crossrail project will deliver a new railway from Reading and Heathrow in the west to Shenfield and Abbey Wood in the east. Crossrail Limited is managing construction, and when TfL-run services open through central London in December 2018 it will be known as the Elizabeth line.

Progress is being made across all areas of the programme, and the successful introduction of Elizabeth line services in the central section remains on schedule for December 2018. There remain some cost and schedule pressures, which continue to be actively managed by Crossrail Limited and ourselves.

A major milestone was achieved on 1 February 2018 when the sub-station at Pudding Mill Lane was successfully switched on. This has allowed the testing of the new trains and systems in the tunnel section between Abbey Wood and Stepney Green to begin. The trains are being tested progressively at increasing speeds, levels of automatic control and number of trains in the tunnels. A significant achievement took place on 13 April 2018, when testing started under full signalling control, with subsequent testing being undertaken in full automatic control and at speeds of more than 60mph.

Station fit-out is continuing, including installation of lifts and escalators, architectural finishes and signage. All platform screen doors have been installed and the installation of systems that are vital for operation of the railway is under way.

Network Rail continues to upgrade the existing rail network for the introduction of Elizabeth line services. Work has also continued at stations on the Shenfield line and tendering is under way for the rebuilding of the stations on the Great Western main line section between Acton Main Line and Hayes & Harlington.

Crossrail's extensive programme of stakeholder and public engagement continues in support of the 2018 Year of Engineering. Events are being held for the public to see the work completed at the stations, and a new exhibition, 'The Secret Life of a Megaproject', has opened at the London Transport Museum.

¹⁷ Crossrail is opening in five stages from mid-2017 until December 2019. The Elizabeth line (Stage 3) launches in December 2018.

Appendix A

2017/18 Budget milestone performance

The TfL 2017/18 Budget milestones for the projects or programmes covered in this report are listed below. The red, amber and green (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
Line upgrades			
Four Lines Modernisation ■¹⁸			
Design for fitment to battery loco type A engineering vehicle completed	30-Jun-17	26-Feb-17	Complete
Communications-based train control (CBTC) Service Control Centre operations training starts	13-Jun-17	18-Apr-17	Complete
Customer information system enabling works (phase 3) between Cannon Street, Paddington, Barons Court and Fulham Broadway completed	13-Jun-17	13-Jun-17	Complete
Tower Hill track alignment works to support service uplift completed	07-Aug-17	02-Jul-17	Complete
CBTC testing of system along areas that do not interface with mainline rail	28-Dec-17	25-Jul-17	Complete
CBTC signalling operators – training starts	05-Nov-17	09-Oct-17	Complete
Transformer rectifier unit modification works complete to enable operation of 750 volt regeneration	23-Feb-18	17-Oct-17	Complete
Track work completed to enable performance at the maximum safe speed as specified in the Thales contract	26-Sep-17	10-Nov-17	Complete
CBTC Circle and Hammersmith & City lines train operators – training starts	24-Oct-17	27-Nov-17	Complete

¹⁸ Thales has rebaselined its programme, which was based on stretch targets, to align with the committed dates in our 2017 Business Plan. We will rebaseline the programme's milestones to reflect the current approach to early timetable delivery.

Milestone description	Plan date	Actual/forecast date	Status
Ruislip depot commission area ready for passenger vehicle testing	21-Aug-17	19-Dec-17	Complete
Final design and structure of track layout for Farringdon Sidings approved	16-Jan-18	12-Jan-18	Complete
Upminster depot de-icing facility operational	12-Feb-18	22-Jan-18	Complete
CBTC fleet maintenance training starts	05-Oct-17	12-Feb-18	Complete
Hammersmith Service Control Centre information and communication system site acceptance testing completed	25-Oct-17	07-Mar-18	Complete
Post-installation check and testing on installed equipment between Hammersmith and Paddington to ensure correct working completed	12-Sep-17	23-Mar-18	Complete
All wayside signalling installation for the Edgware Road/ Finchley Road to Euston Square migration area complete	26-Jul-17	26-Apr-18	■

Q1: 70 days late ■ Q2: 65 days late ■ Q3: 120 days late ■ Q4: 120 days late ■

The cable installation at Finchley Road took longer than planned because the work site was shared with another project (Baker Street to Finchley Road). We are discussing mitigation measures with our contractor to ensure there is no impact on critical schedule dates. Additionally, it was necessary to revise the location of some signalling equipment, which caused some design rework and associated procurement delays.

There is no impact on the overall schedule as there was sufficient float in the construction schedule on this non-critical activity.

CBTC 30 Metropolitan line trains (half the line's fleet) fitment completed	05-Dec-17	01-Apr-18	■
Q1: 25 days early ■ Q2: 25 days early ■ Q3: 144 days late ■ Q4: 117 days late ■			
Bombardier Trains had experienced a number of technical issues during early train fitment, resulting in the planned production rate of two trains per week not being achieved.			
CBTC signalling system ready for commissioning between Hammersmith and Latimer Road	31-Mar-18	27-May-18	■
CBTC signalling system performance monitoring for Hammersmith to Paddington – completed	05-Feb-18	27-May-18	■

Q1: 88 days late ■ Q2: 52 days late ■ Q3: 52 days late ■ Q4: 111 days late ■

To maximise the reliability of the system, we introduced a new strategy for the performance monitoring operation which assumes that instead of finishing the performance monitoring prior to commissioning, it will now continue up to the point of the signalling migration area going live. Despite the fact that any movement of the commissioning date will result in further delaying the completion of this operation, nonetheless this strategy will result in using all the time available to ensure a reliable system is in place, without any impact on the commissioning of the first migration area.

Milestone description	Plan date	Actual/ forecast date	Status
Thales site software readiness review for release	19-Oct-17	07-Aug-18	■
Q1: 193 days late ■ Q2: 223 days late ■ Q3: 292 days late ■ Q4: 292 days late ■ Software development has been delayed to allow for the system design to progress and mature further, therefore de-risking the process. This has been mitigated through the use of float within the schedule for this project and the delay does not impact the planned commissioning date for the Finchley Road to Preston Road migration area.			
Wayside infrastructure (signal equipment rooms, power and cable management system) for District line east completed	27-Mar-18	29-Aug-18	■
Q1: 37 days late ■ Q2: 78 days late ■ Q3: 156 days late ■ Q4: 155 days late ■ Although earlier signalling migration areas are being prioritised, there are issues with design, installation and Network Rail approvals that have caused some delays in the area. Potential impacts on the commissioning dates are managed through an early access arrangement for the contractor.			
Wayside infrastructure (signal equipment rooms, power and cable management system) for Circle line completed	29-Nov-17	11-Sep-18	■
Q1: 16 days late ■ Q2: 78 days late ■ Q3: 184 days late ■ Q4: 286 days late ■ The detailed design of the cable management system (CMS) has identified that more hangers, cable routes and cable lengths are required than had been identified in the concept design. Additionally, a reprioritisation on critical assets and locations has resulted in non-critical assets being postponed, causing a delay to this milestone. Although the CMS issue has increased material and installation costs, we have identified a number of options to reduce the impact. There is no impact to the commissioning dates of the respective signalling migration areas, as an arrangement of early access for the contractor exists.			
Ealing Common depot de-icing facility operational	23-Jan-18	11-Jan-19	■
Q1: 175 days late ■ Q2: 248 days late ■ Q3: 311 days late ■ Q4: 353 days late ■ Following the start of work to repair structural faults in the Ealing Common EC3 shed, we identified major structural issues with the gable end wall, which will need to be demolished and replaced. Additional assessments of the existing gable end wall and roof trusses and associated prolonged design in Ealing Common shed 3 has further impacted the related de-icing facility in Quarter 4. This has been mitigated by a temporary de-icing facility and there is no specific additional cost for these works as they are integral to operating the depot. We are currently reviewing options to mitigate the further delay.			

Milestone description	Plan date	Actual/ forecast date	Status
World class capacity ■			
Victoria line upgrade 2 ready for extending to 36 trains per hour service	21-May-17	12-May-17	Complete
Jubilee line upgrade 2 ready for extending to 30 trains per hour service	24-Aug-17	05-Dec-17	Complete
Jubilee and Northern line additional trains contract award	19-Oct-17	n/a ¹⁹	n/a ¹⁹
Northern line upgrade 2 detailed design for the Morden track, civils, earth and structures completed	06-Dec-17	n/a ¹⁹	n/a ¹⁹
Northern line upgrade 2 Morden civil earth structure site works begin	05-Feb-18	n/a ¹⁹	n/a ¹⁹
Network extensions			
Northern Line Extension ■			
Tunnelling between Battersea and Nine Elms station completed	01-Aug-17	04-Aug-17	Complete
Kennington Loop enabling works completed	15-Sep-17	18-Aug-17	Complete
Kennington Green shaft – second tunnel-boring machine arrives	20-Oct-17	08-Nov-17	Complete
Kennington Loop – 10-day closure for works	23-Dec-17	23-Dec-17	Complete
Nine Elms station – all basement level 2 top-down slabs poured as part of the top-down construction method	31-Mar-18	24-Jan-18	Complete
Nine Elms station – break through into the existing Northern line tunnels	16-Mar-18	19-Jan-18	Complete
Silvertown Tunnel ■			
Property cost estimate, as at June 2017, of land required for construction at Silvertown Tunnel	14-Jul-17	16-Jun-17	Complete
Invitation to negotiate issued	20-Jun-17	20-Jun-17	Complete
Major stations			
Victoria station upgrade ■			
Basement areas handed back to Network Rail	26-Jun-17	23-May-17	Complete

¹⁹ These milestones are no longer relevant as a result of the pause of the programme.

Milestone description	Plan date	Actual/ forecast date	Status
North ticket hall completed, including step-free access to all platforms via lifts	31-Dec-17	18-Jun-18	■
Q1: 22 days late ■ Q2: 75 days late ■ Q3: 155 days late ■ Q4: 169 days late ■			
<p>The completion of step-free access to all platforms via lifts from the north ticket hall has been delayed by contractor lift resource issues. Although the lift contractor continues to deliver against its revised programme, some defects with manufactured items have caused a small further delay in the quarter.</p> <p>We continue to work with the contractor and lift supplier to provide an increased level of resource and appropriate management focus to deliver the remaining step-free access by June 2018.</p>			
Bond Street station upgrade ■			
Station back into full service	27-Aug-17	17-Nov-17	Complete
Station upgrade complete, including a new station entrance and step-free access to all platforms	31-Dec-17	17-Nov-17	Complete
Bank Bloomberg Place ■			
Waterloo & City line entrance opens to customers	18-Jan-18	14-Jun-18	■
Q1: 28 days early ■ Q2: 46 days late ■ Q3: 112 days late ■ Q4: 147 days late ■			
<p>Following a previous delay caused by complexity in the design, manufacture and installation of the fire doors on the connections to the existing station, the design and build contractor has not progressed the station systems integration and upgrade work. The contractor has advised that it was not within scope, despite actions showing there were plans to do the work. The late notification of this has significantly impacted the programme.</p> <p>We have instructed the main contractor to appoint specialist subcontractors to progress this work, however there is a risk that the agreement of terms and conditions may take longer than expected. We are working closely with all parties to try to prevent any further delay.</p>			
Bank station capacity ■			
Tunnelling begins	31-May-17	10-May-17	Complete
Excavation works begin	16-Oct-17	16-Oct-17	Complete
Bakerloo line link ■			
All systems (such as link switch rooms, lifts, chiller room and link tunnel) installed and ready for start of integration and testing	29-Mar-18	21-May-18	Complete
LU track renewals ■			
Completed renewal of 15 points and crossings units	31-Mar-18	05-Jan-18	Complete
Completed renewal of 2,500 metres of track drainage	31-Mar-18	05-Jan-18	Complete

Milestone description	Plan date	Actual/ forecast date	Status
Deep Tube renewals – 2,500 metres completed	31-Mar-18	05-Jan-18	Complete
Ballasted track renewal and re-ballast – 7,000 metres completed	31-Mar-18	06-Apr-18	Complete
LU infrastructure renewals ■			
Lifts and escalators			
Lancaster Gate lifts 1 and 2 replacement – new lifts fully operational	28-Aug-17	26-Jun-17	Complete
Euston escalator 5 refurbishment – escalator fully operational	24-Jul-17	29-Jun-17	Complete
Final escalator at Holborn station (Piccadilly line) – operational	20-Oct-17	30-Aug-17	Complete
Power upgrades			
Power asset renewals Park Royal Group high voltage – start on first site	17-May-17	03-Apr-17	Complete
Central line resilience works Bow and South Woodford – contract award recommendation	08-May-17	07-Apr-17	Complete
Dual power – Queensbury transformer room fit-out completed	31-Aug-17	15-Aug-17	Complete
LU rolling stock renewals ■			
Bakerloo line rolling stock life extension weld repairs – 20 of 36 trains complete (target for full completion – November 2018)	13-Dec-17	18-Apr-18	Complete
Healthy Streets ■			
Oxford Street west transformation – first public consultation	21-Jun-17	24-Apr-17	Complete
Archway gyratory construction (excluding Despard Road loading bay) complete	09-Jun-17	24-May-17	Complete
50km (about 60 per cent) of borough Central London Cycling Grid network either in progress or completed	30-Sep-17	30-Sep-17	Complete
4km of segregated Enfield Mini-Hollands cycle route completed	31-Mar-18	05-Oct-17	Complete
Cycle Superhighways route 11 – Swiss Cottage detailed design work completed	15-Dec-17	01-Dec-17	Complete
Surface Intelligence Technology implementation – notification of Urban Traffic Control contract award to selected supplier	22-Feb-18	22-Dec-17	Complete

Milestone description	Plan date	Actual/ forecast date	Status
100km of Cycling Quietways construction either complete or in progress	31-Jan-18	31-Jan-18	Complete
Crossrail complementary measures – implementation completed on four schemes	30-Mar-18	30-Mar-18	Complete
Bus priority improvements of 64 minutes to bus journey times on borough roads through schemes aiming to reduce delays ²⁰	31-Mar-18	N/A	■
Wandsworth gyratory removal – Board approval of the principle of making a Compulsory Purchase Order	15-Dec-17	30-Nov-18	■

Q1: 17 days early ■ Q2: 103 days early ■ Q3: 350 days late ■ Q4: 350 days late ■

We have deferred the submission to Board for the principle of making a Compulsory Purchase Order until November 2018 to allow time to finalise the land negotiations and do further investigations that will result in greater cost certainty. This deferral, which also results in a delay in purchasing land, is in line with the most recent budget setting.

There is no impact on the Healthy Streets objective or on other projects within the portfolio.

Air quality and environment ■

Emissions Surcharge (T-Charge) launch	23-Oct-17	23-Oct-17	Complete
75 per cent of the buses operating in the ULEZ will be compliant	30-Mar-18	30-Sep-18	■

Q1: 28 days early ■ Q2: 28 days early ■ Q3: 184 days late ■ Q4: 184 days late ■

All 306 Euro V New Routemasters were specifically considered to be ULEZ compliant when this milestone was set. Within the Mayor's November announcement of an earlier introduction of the central London ULEZ (starting in April 2019), a requirement was made that all Euro V New Routemaster buses will need to comply with Euro VI emissions as part of ULEZ standards.

All Euro V New Routemasters will be retrofitted to meet Euro VI emissions. The cost of the retrofits will be funded through the existing NO_x Abatement Programme. Retrofitting is the most cost-effective method to reduce emissions from these buses. We remain on track to meet all air quality targets, including implementing 12 Low Emission Bus Zones, the central London ULEZ and a Euro VI (or better) emissions bus fleet by 2020.

²⁰ Twenty-five minutes (39 per cent of the in-year target) was achieved for the full year. The Bus Priority programme identified and delivered the 'quick win' borough schemes, however the remaining schemes were more complicated to deliver than anticipated when the target was set and the programme experienced significant delays.

Milestone description	Plan date	Actual/ forecast date	Status
Public transport ■			
London Overground track protection warning system detailed design approved by Network Rail	15-May-17	14-Apr-17	Complete
Trams assets gearbox overhauls started	02-Oct-17	05-Jun-17	Complete
London Overground West Anglia stations programme main works completed	28-Jun-17	23-Jul-17	Complete
Cycle Hire new operating model with new back office systems and different distribution, call centre and cleaning contracts – transitioned into service	30-Aug-17	01-Aug-17	Complete
London Overground Willesden driving motor unit electrification option selection design approved by Network Rail	28-Jun-17	22-Aug-17	Complete
West Hampstead station over-track footbridge completed	27-Oct-17	14-Dec-17	Complete
Trams assets mid-life refurbishment completed	04-Mar-18	04-Feb-18	Complete
London Overground train crew accommodation – main works at Chingford completed	25-Feb-18	n/a	■
These works are to transfer to Arriva Rail London for delivery to maximise market efficiencies, and discussions are under way about how transfer of funds will occur.			
DLR rolling stock replacement concept design for Beckton depot completed	25-Feb-18	12-Apr-18	■
Assets ■			
Upper Holloway railway bridge replacement construction completed	24-Jun-17	24-Jun-17	Complete
Other ■			
Technology and data ■			
Contactless extended to the Oyster app	30-Mar-18	15-Jun-18	■
IM ■			
New multi-modal command and control system operational	31-Aug-17	26-Apr-17	Complete

Milestone description	Plan date	Actual/ forecast date	Status
Commercial development ■			
Installation programme agreed for Digital Portrait advertising screens	04-Sep-17	27-Sep-17	Complete
Five small development sites brought to market for property development through a pilot programme	30-Mar-18	12-Feb-18	Complete
Six major sites brought to the property development market through a variety of routes, including our Property Partnerships Framework and wider market engagement	30-Mar-18	28-Mar-18	Complete
Completion of the sale and lease back deal for the 55 Broadway building, which will deliver a significant capital receipt while retaining it as relatively low-cost office space	30-Mar-18	n/a	■

The sale of 55 Broadway has been put on hold following a change in our accommodation strategy since the milestone was set.

Elizabeth line integration

Rolling stock

 ■

The first new Class 345 trains on the Great Eastern section from Liverpool Street to Shenfield introduced into TfL Rail passenger service	31-May-17	22-Jun-17	Complete
Full fleet of new class 345 trains in passenger service on the Great Eastern section from Liverpool Street to Shenfield	17-Oct-17	11-Apr-18	Complete

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