

# Transport for London investment programme report

Quarter 2 2018/19

MAYOR OF LONDON



**TRANSPORT  
FOR LONDON**  
EVERY JOURNEY MATTERS

## About Transport for London (TfL)

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

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

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

We run most of London's public transport services, including the London Underground, London Buses, the DLR, London Overground, TfL Rail, London Trams, London River Services (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.

# Contents

---

## 4 Introduction

---

## 8 Mayor's Transport Strategy

---

## 10 Business at a glance

---

## 12 Key achievements

---

## 16 2018/19 Budget milestone performance summary

---

## 18 Major projects

- 19 Line upgrades
  - 25 Deep Tube Upgrade programme
  - 27 Network extensions
  - 31 Major stations
  - 37 Future projects
- 

## 38 London Underground

- 38 Stations
  - 43 Accessibility
  - 44 Track renewals
  - 45 Power, cooling and energy
  - 46 Rolling stock renewals
  - 48 Signalling and control
- 

---

## 50 Surface

- 51 Healthy Streets
  - 60 Air quality and environment
  - 62 Asset investment
  - 64 Public transport
- 

## 70 Other

- 71 Technology and data
  - 76 TfL Growth Fund
  - 78 Elizabeth line
  - 81 Crossrail
- 

## 82 Appendix

- 82 2018/19 Budget milestone performance
- 

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

# Introduction

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

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

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

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

Financial records of spend to date, authority and estimated final cost (EFC) represent the entire duration of each separate project or programme, except for annual portfolios where spend to date, authority and EFC figures represent the current financial year. Where

authority is significantly lower than EFC, it has been given for the current stage of works and further authority will be sought when appropriate.

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

EFC increase of two per cent or more:



EFC increase of five per cent or more:



EFC decrease of two per cent or more:



EFC decrease of five per cent or more:



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

We also include cumulative EFC movements for savings and efficiencies that have been embedded since our 2018 Business Plan, while protecting safety, services and reliability. Numbers in brackets represent an EFC increase and numbers without brackets represent an EFC decrease. Commentary is provided for cumulative movements greater than £2m.

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

All financial figures are gross and may not appear to align with costs detailed in the TfL Budget, which are net of any third-party funding. In addition to the committed projects and programmes included in this report, we will be seeking to obtain capital spend authority for schemes such as the Bakerloo Line Extension and Crossrail 2.

Each sub-programme or project also has an overall RAG milestone status, which represents the average forecast date variance against plan for 2018/19 budget milestones:

On time or early:



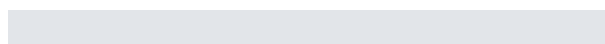
Up to 89 days late:



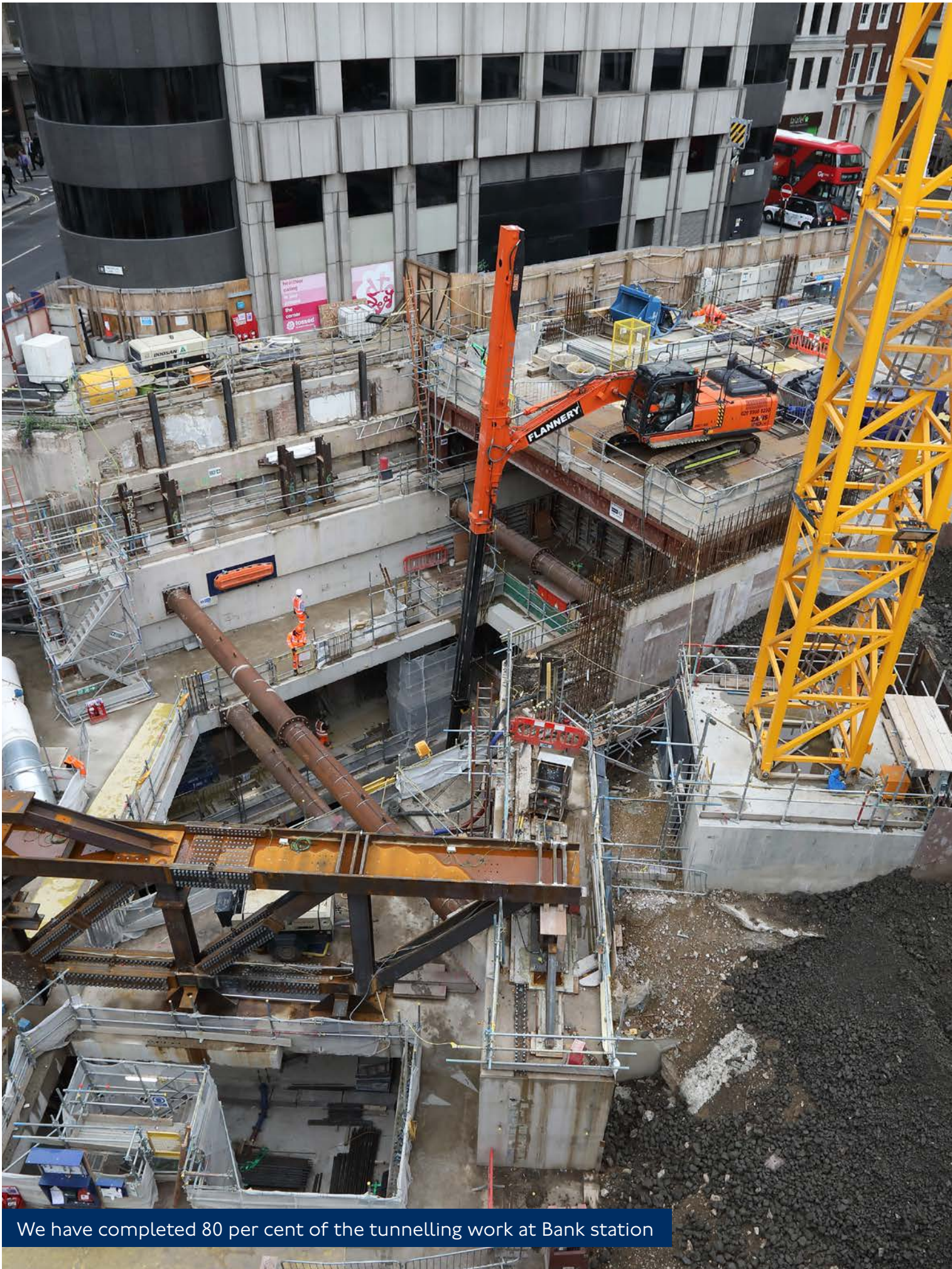
90 or more days late:



N/A (without 2018/19 budget milestones):



Budget milestones for 2018/19 – the key milestones listed in the TfL Budget – are detailed in the Appendix (page 84).



We have completed 80 per cent of the tunnelling work at Bank station

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

- Major Projects is responsible for our largest and most complex projects. It comprises line upgrades, deep Tube upgrade, network extensions, and major stations, which are covered in pages 18-37 of this report. Future Major Projects schemes (see page 37) will be reported in detail following financial authority approval
- London Underground comprises stations, accessibility, track renewals, power, cooling and energy, rolling stock renewals, and signalling and control, which are covered in pages 38-49
- Surface comprises Healthy Streets, air quality and environment, public transport, and asset investment. These are covered in pages 50-69
- Other comprises technology and data, TfL Growth Fund, and the Elizabeth line (including Crossrail), which are covered in pages 70-81

# Mayor's Transport Strategy

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

We are providing more trains on our busiest services and opening the Elizabeth line. We are also 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 everyday operational excellence will unlock the new jobs and homes that our city needs.

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

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

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**Healthy Streets and healthy people**



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**A good public transport experience**

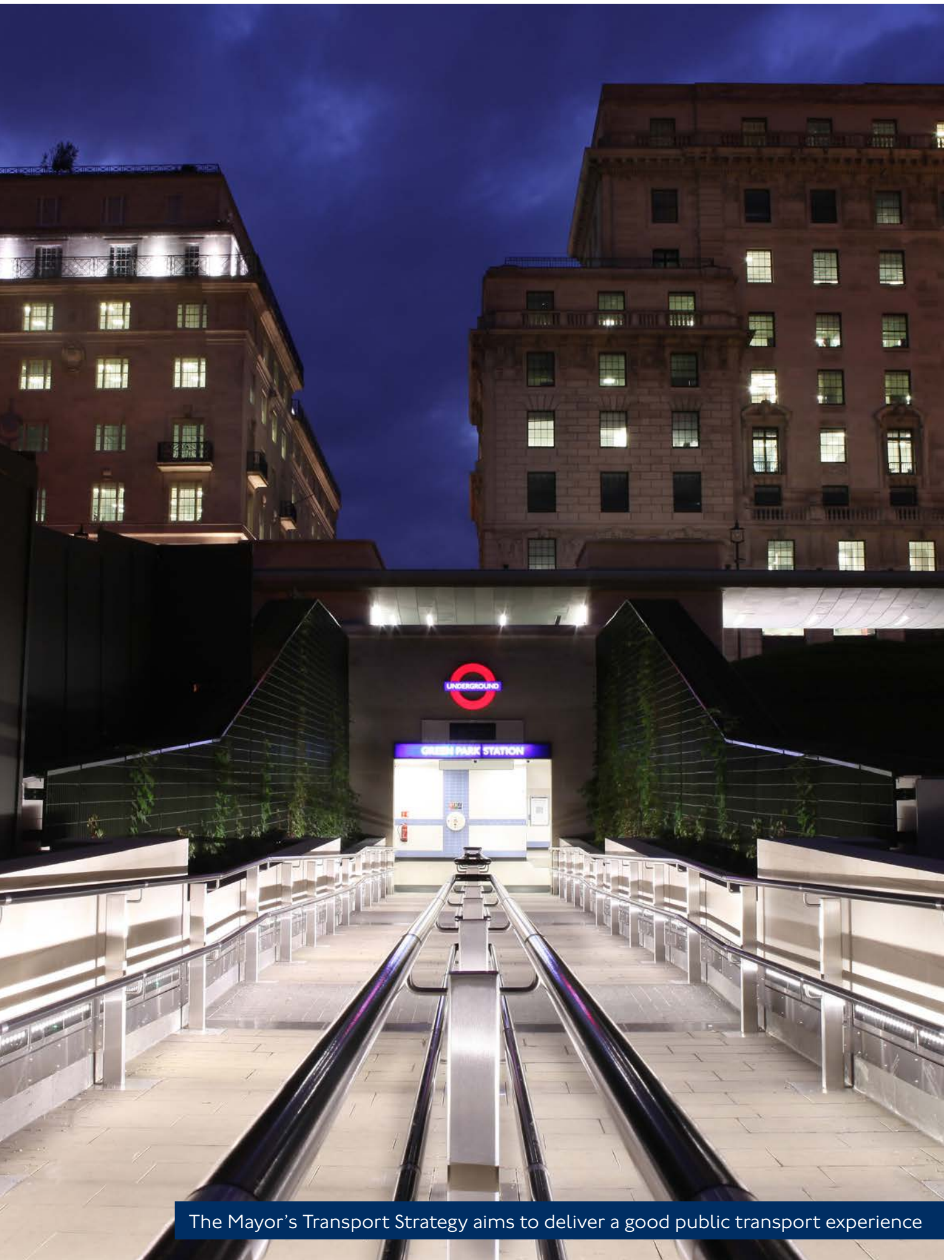


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**New homes and jobs**







The Mayor's Transport Strategy aims to deliver a good public transport experience

# Business at a glance

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

## How we report on our business



## Facts and figures\*

**940** Trains on the TfL network



**580km**

TfL-operated highways



**680km**

TfL-operated Rail and Underground routes



**9,550**

Buses on the TfL network

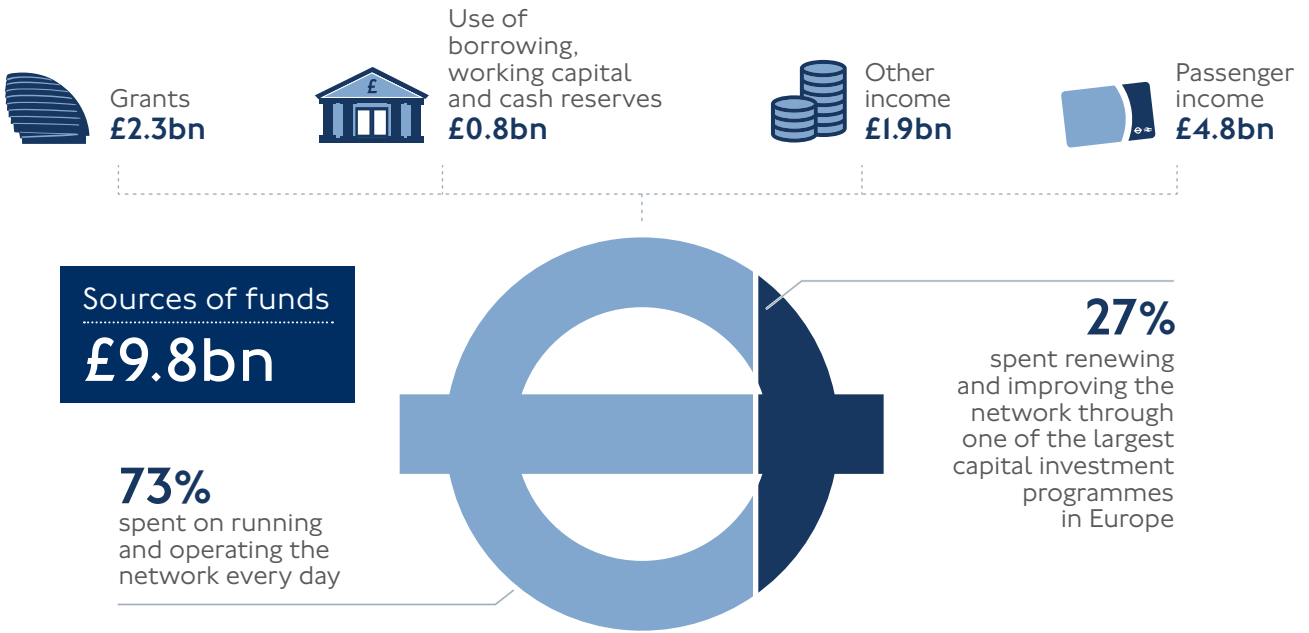


**6,350**

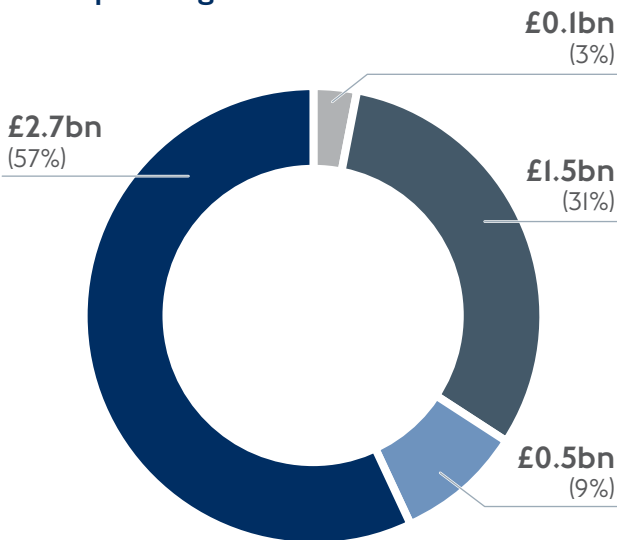
Traffic signals operated by TfL

\*Based on full year 2017/18

## Budget at a glance



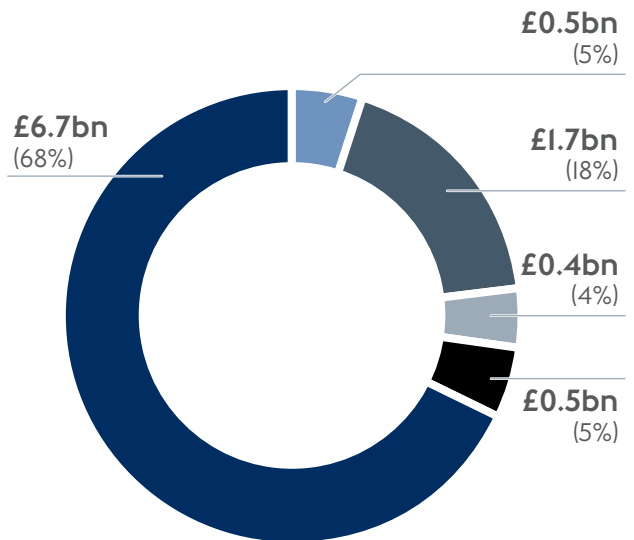
## Total passenger income



Total: **£4.8bn**

- Underground
- Rail
- Buses
- TfL Rail

## Total costs



Total: **£9.8bn**

- Operating costs
- New capital investment
- Capital renewals
- Crossrail
- Net financing

# Key achievements

## Line upgrades

As part of the Four Lines Modernisation programme, we have installed the new automatic train control equipment on 75 trains required for the front section of the new signalling. We are also on schedule to upgrade trains for the remaining sections of the railway.

On the Capacity Optimisation programme, we have completed Northern Line Speed Improvement and all of the track works. The design and build contract has been awarded for the Northern line power works.

## Network extensions

On the Northern Line Extension, we have built four cross passages between Kennington station's platforms and have now resumed services. Track has been installed in the tunnels between Nine Elms station and Battersea Power Station. We have nearly completed the architectural ceiling in the ticket hall. We received an 'Excellent' rating on our interim Civil Engineering Environmental Quality Assessment and Awards Scheme (CEEQUAL) assessment (sustainability self-assessment and awards scheme).

## Stations and infrastructure

In August 2018, we opened three new escalators leading down from the south ticket hall at Victoria and reinstated the Kent Stairs linking the south ticket hall directly into the Network Rail station. This will help relieve congestion.

Victoria Tube station is now step-free, improving access for millions of people. Seven new lifts have been installed, enabling step-free journeys between the street and Victoria line trains and the Circle and District line platforms. Customers from the mainline station can also travel step-free to the Tube station and interchange more easily between the three lines.

At Bank Bloomberg Place, we have completed the majority of the physical installation works across the new station entrance and only minor finishing works and cleaning remain. Final inspections are taking place, along with final system integration tests.

At Bank station, we have completed 80 per cent of the tunnelling work and we are ahead of schedule for waterproofing the tunnels. We marked a major achievement by completing the large-scale, top-down excavation works and we can now begin installing lift shafts for the new station entrance and ticket hall under the Bank project.

## London Underground track and civils

We have now replaced 1.7km of ballasted track, 350 metres of drainage and 800 metres of concreted deep Tube track. In August, we replaced the track from South Kensington to Gloucester Road and reduced the vertical step between trains and platform one.



Services have resumed at Kennington station

During a weekend in early September, we completed more than 300 metres of track between Woodford and South Woodford and at Leytonstone.

On the Jubilee line, we have refurbished 31 out of 63 trains and they are now back in service. The refurbishment includes a wheelchair area, new flooring, refreshed interiors and works to improve the reliability of trains.

### **Surface**

The Healthy Streets programme is progressing to plan. We have completed 32 Mini-Hollands schemes, including the A105 Green Lanes scheme, a five kilometre protected cycle route linking Enfield Town to Palmers Green.

We have completed 40 kilometres of the 85km Central London Cycling Grid network, including several sections of Quietway and Cycle Superhighway routes, such as Broadway Market to Old Street, Blackfriars to Tower Bridge and Earls Court to Belgravia.

Following the successful launch of Quietway 2 (East), the route was used by 24,000 cyclists.

Since launching the Eastern and Western sections of Quietway 2 the Walking and Cycling Commissioner has launched six further Quietways. These include Gladstone Park to Kilburn, Oval to Clapham Common, Wanstead Flats to Barkingside, Central London Grid: Blackfriars to Tower Bridge Road, Earls Court to Belgravia and Stratford High Street to Newham Way.

On 19 September, we partnered with Oakdale Junior School to mark the European Day Without A Road Death. The event saw 54 pupils, who regularly have to cross Charlie Brown's Roundabout on their way to and from school, take part in a walking bus and big breakfast. The event was a success and particularly poignant for many of the staff who volunteered on the day following the death of the mother of one of the pupils at the roundabout in 2016.

We completed the extension to Cycle Superhighway 6 in September 2018, delivering safety improvements at two Safer Junctions locations. In addition to segregated cycle lanes replacing sections of traffic and bus lane on Farringdon Road and Farringdon Street, we introduced new traffic restrictions at the junction with Clerkenwell Road to help create better conditions for cyclists.

The boroughs of Ealing, Greenwich, Hackney, Haringey, Havering, Lewisham and Waltham Forest were all successful in their initial bids for funding under the Liveable Neighbourhoods programme and will now develop their proposals to secure implementation funding. There will be another round of funding allocation in 2018, when other boroughs will be able to submit proposals for further Liveable Neighbourhoods funding.

There are now more than 2,200 Ultra Low Emission Zone (ULEZ) compliant buses (both single and double deck) in service. More than 80 per cent of the bus fleet travelling in the zone is already compliant with the new emission standards.

The Edmonton to Seven Sisters corridor is more than 90 per cent complete and the Stratford corridor is 70 per cent complete. In addition to vehicles operating in the ULEZ, we are also retrofitting NOx abatement equipment on buses across London. More than 2,000 buses have been converted and these are directly delivering benefits for the Mayor's programme to improve air quality. At the National Air Quality Awards in October, the Low Emission Bus Zone programme won the award for Passenger Transport Air Quality Initiative of the year.

As of 12 October, we have installed 135 rapid charging points on our highways and land under the Ultra Low Emission Vehicles project. Sixty of these points are now dedicated for taxis.

A significant milestone was achieved at the end of August 18 with the launch of the second phase of the replacement of Ardleigh Green Bridge over the railway.

In preparation for the new London Overground rolling stock platform extension, works are now complete on the Gospel Oak to Barking line and 'correct side door' equipment has been installed on the line, as well as West Anglia lines and the Romford to Upminster line.

The train protection warning system has also been installed on the sections of the Euston to Watford line that are shared by London Underground and London Overground services

London Trams went cashless in July. The existing ticket machines, which date to the opening of the system, will be removed and the newly available space at our tram stops will provide additional platform capacity, seating and/or information boards, depending on location.

### **London Underground stations**

We have completed concept design for the South Kensington station capacity upgrade and continue work to appoint a design and build contractor later this year to deliver the works.

We recently installed new platform displays at several locations including Temple, Fulham Broadway, Upney and Amersham to provide accurate train information to customers. We completed lift installation works at Newbury Park and the station became step-free on 1 November 2018.

### **Other**

The contactless functionality in the Oyster and contactless app was updated in August to allow customers to add a contactless card to their account in the app.

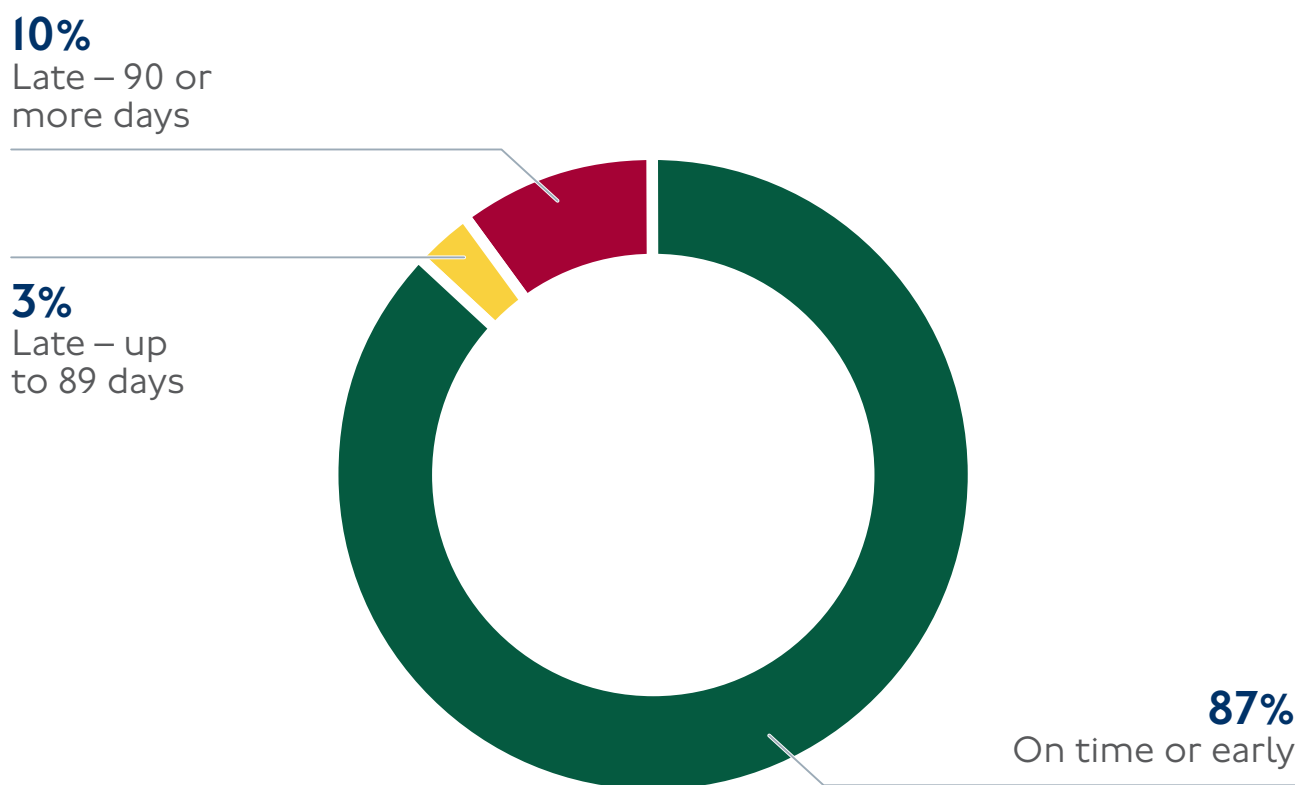


We continue to improve our Cycle Superhighways



# 2018/19 Budget milestone performance summary

The overall performance for all TfL 2018/19 Budget milestones is summarised as follows:



The late milestones are shown in Appendix A.



Our new rolling stock

# Major projects

Line upgrades   

## Four Lines Modernisation

Forecast completion year

**2023**

Spend to date (£m)

**4,463**

Spend authority (£m)

**5,412**

EFC (£m)

**5,243**

EFC movement post plan (£m)

**16**

2018/19 budget milestone RAG 

**We have already introduced 192 new S-stock trains on the Circle, District, Hammersmith & City and Metropolitan lines, and are working to complete the associated depot, station, siding and signal modifications to accommodate them. We are upgrading three depots to support new train maintenance.**

The new automatic train control signalling system will control train movements, enabling more frequent and reliable services. In addition to designing and installing the system, we are working on the related infrastructure and fitting S-stock trains and engineering vehicles with in-cab signalling equipment.

We continue to test the automatic train control system to ensure its reliability before it is brought into service. The scope of testing has been extended and now includes the route from Hammersmith to Stepney Green, Monument and Finchley Road, and around Earls Court. The first section will go live in the first quarter of 2019. Reliability is essential as there are 14 migration areas to follow as planned.

We are targetting commissioning of the Circle line by the end of 2019 to support an early timetable uplift in March 2020. This would be 21 months ahead of schedule. Commissioning of the final signalling area between Rayners Lane and Uxbridge remains on schedule to support the final timetable uplift in May 2023.

The EFC remains at £5,243m this quarter, £16m lower than the 2017 Business Plan. The reduction to plan is the result of a revised strategy regarding the removal of redundant assets and savings driven by reduced decommissioning costs at the Network Rail test track. There are early indications of a cost challenge on the main signalling contract, which is being reviewed in detail to drive mitigations.

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All trains are being fitted with automatic train control equipment. We have converted 75 trains, which is enough to support automatic train operation in the first section of the railway between Hammersmith and Latimer Road. We are on schedule to upgrade sufficient trains for the remaining sections of the railway.

Overall, the programme is below budget and financial authority. The EFC has remained steady at £169m below financial authority at £5,243m.

### Assurance

Project Assurance completed an integrated assurance review on the Four Lines Modernisation programme submission to the Programmes and Investment Committee meeting on 11 October 2018. Fifteen recommendations were made and accepted, including 11 by the Independent Investment Programme Advisory Group (IIPAG). We are making good progress to close out the recommendations. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.



Rolling stock on the Hammersmith & City line



## Capacity Optimisation – World Class Capacity

Forecast completion year

**2024**

Spend to date (£m)

**104**

Spend authority (£m)

**245**

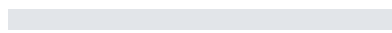
EFC (£m)

**209**

EFC movement post plan (£m)

**36**

2018/19 budget milestone RAG



**World Class Capacity is a new portfolio of enhancement works, including signalling, power, track and data to increase capacity on the Jubilee and Northern lines without needing additional fleet.**

We are on schedule to complete all milestones to deliver elements of scope for the Northern Line Extension and Bank capacity upgrade, which were not previously part of World Class Capacity. We have completed the Northern line speed improvement and track works. The design and build contract has been awarded for the Northern line power works.

An additional wheel lathe and lifting facility is required at Morden Depot to increase train availability to peak service frequencies on the Northern line once the extension has opened. This project is taking place in collaboration with Alstom, which provides the Northern line fleet.

### Assurance

Project Assurance has completed an integrated assurance review on the World Class Capacity programme submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided on 11 October 2018 on the six recommendations that were made and accepted, including three by IIPAG. All recommendations are now closed out. Project Assurance tracks progress against these as part of continuous assurance.

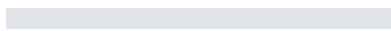
The EFC has reduced by £36m against the 2017 Business Plan. The reduction relates to the removal of turning facilities at East Finchley, following a strategic scope review and savings identified from a programme cost and risk review.



## Capacity Optimisation – DLR Rolling Stock and System Integration

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
<b>2025</b>	<b>10</b>	<b>22</b>	<b>*</b>	<b>*</b>

2018/19 budget milestone RAG



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

We continue to achieve key milestones in all areas, and have established credible and achievable future plans. There have been zero accidents or injuries.

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

Tenders to replace the rolling stock were received on 1 June 2018, with evaluations due to finish by the end of 2018. The depot concept design has been accepted by stakeholders with tender documents completed for the next detailed design contract. Geotechnical and topographical surveys have been contracted and work has started on site.

Workshops with Keolis Amey Docklands to plan how the operational service will be maintained during the depot works has begun. Negotiations with UK Power Networks to secure additional power supplies have begun and a solution proposed. Negotiations continue with Thales to agree the scope of services for the signalling upgrade required to support the replacement rolling stock.

Specific progress highlights include the ongoing evaluation of the rolling stock procurement, and receipt of responses to the detailed design tenders in respect of the Beckton Depot project.

\* This information is withheld until final contract is awarded



New Piccadilly line trains



# Deep Tube Upgrade programme



## Deep Tube Upgrade programme

Forecast completion year

**2034**

Spend to date (£m)

**92**

Spend authority (£m)

**3,294**

EFC (£m)

**3225**

EFC movement post plan (£m)

**\***

2018/19 budget milestone RAG



**The Deep Tube Upgrade programme will provide more capacity on the Bakerloo, Central, Piccadilly 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.**

Following the announcement of our intention to award the Contract for the Piccadilly line rolling stock to Siemens Mobility Limited in June 2018, and subsequent claims by the unsuccessful bidders that resulted in an automatic suspension of the contract award, we submitted an application to lift the suspension in Quarter 2. This was successful and the contract with Siemens has been signed.

### Assurance

Project Assurance completed an integrated assurance review on the Deep Tube Upgrade programme submission to the Programmes and Investment Committee meeting in May 2018. A quarterly update was provided to the Committee on 11 October 2018 on the 10 recommendations that were made and accepted, including five by IIPAG. Nine recommendations are closed and good progress is being made to close the one remaining. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

The EFC and spend authority relates only to works and enabling associated with the introduction of the Piccadilly line rolling stock. Work continues on additional scope for the Deep Tube Upgrade programme, which forms part of a wider programme EFC. The EFC is £69m lower than spend authority, primarily as a result of increased certainty of resourcing requirements and an associated reduction in risk.

\* The 2017 Business Plan was based on an aggregated programme for all DTUP works. This was disaggregated in May 2018 for authority approval of the Piccadilly rolling stock and associated enabling works as now represented in the above EFC.

# Network extensions



## Northern Line Extension

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
<b>2020**</b>	<b>643</b>	<b>*</b>	<b>*</b>	<b>*</b>

2018/19 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 is a catalyst for the regeneration of the Vauxhall Nine Elms Battersea Opportunity Area.**

Following the construction of four cross passages between Kennington station's platforms and the resumption of services, the final fit out of the station is now complete. This includes the installation of the flooring and electrical works, as well as tiling the walls.

At Nine Elms station, the primary civils construction works were completed in late September. More than two-thirds of the pre-cast platform sections have been installed and casting of the lining wall and column encasement continues. Site set-up to create the internal walls and rooms and construction of the eastern superstructure has started.

Track has now been installed in the tunnel sections from Nine Elms station to Battersea Power Station. The cable management system between Kennington Green shaft and Nine Elms station is complete and was installed between Kennington Park shaft and Nine Elms station as planned in October 2018.

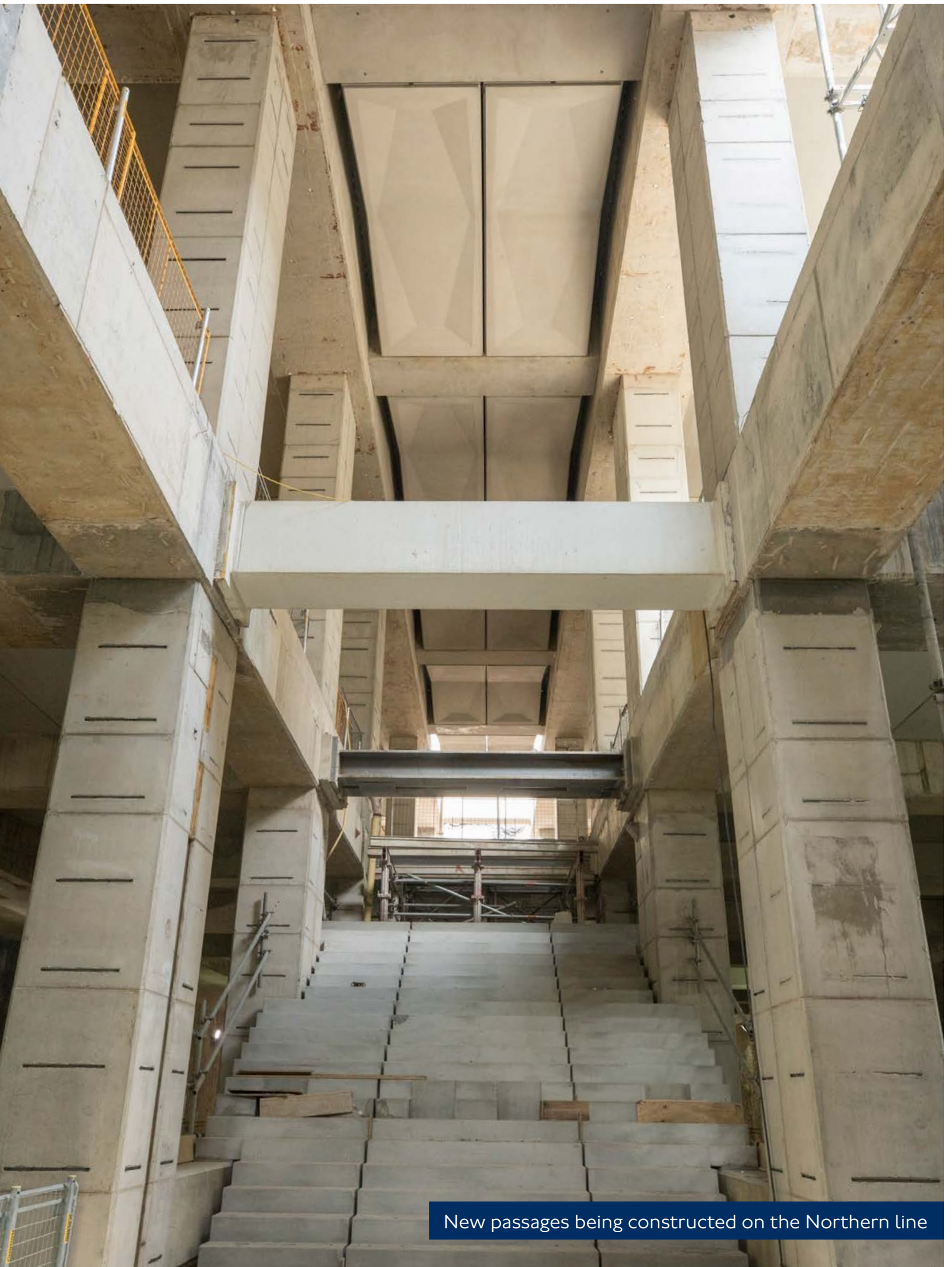
The basement for the Kennington Green head-house has been excavated and has allowed the base slab to be cast and the secondary lining in the shaft is to be completed. Excavation at Kennington Park head-house is ongoing with temporary propping installed.

Construction has started at Battersea Power Station on the internal walls. Construction of the eastern and western service lift shafts and emergency stairs were completed in September 2018. Installation of the architectural ceiling in the ticket hall continues with 80 of the final 92 sections installed. Both platforms have been completed and pre-cast stairways installed. Work continues on the back of house internal rooms.

We achieved an 'Excellent' rating on our interim CEEQUAL assessment. This reflects commitments and focused efforts from both client and design teams to embed and influence environmental, economic and social elements.

\* This information is withheld for reasons of commercial sensitivity.

\*\* This is being reviewed as the designs for Battersea Power Station's over site development and the Tube station have evolved.



New passages being constructed on the Northern line

## Silvertown Tunnel

Forecast completion year

**2024**

Spend to date (£m)

**45**

Spend authority (£m)

\*

EFC (£m)

\*

EFC movement post plan (£m)

\*

2018/19 budget milestone RAG



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

The contract award has been delayed by five months until July 2019 as additional ground investigation surveys had to be completed. The remaining land surveys were delayed due to the development consent order postponement affecting private land access, which resulted in an increased time to complete arrangements. Surveys are now complete and will inform the bidders' final technical submissions, which are expected at the end of January 2019. The first stage of technical submissions were delivered in July and we are evaluating them.

Contracts were awarded to two separate consultancies in July for the detailed design of the North Greenwich car park and other minor supplementary works. We did this in advance of the main Public Private Partnership contract in order to reduce the risk of delays.

We let the contract for the baseline monitoring of assets belonging to DLR, Emirates Air Line and Southern Gas Networks/Birch sites in July 2018. Work will start this autumn to install the monitoring equipment and the 12 month monitoring period will start immediately afterwards.

#### Assurance

Project Assurance completed an integrated assurance review on the Silvertown Tunnel programme submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 11 October 2018 on the 10 recommendations that were made and accepted, including six by IIPAG. Five recommendations are 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.

\* This information is withheld for reasons of commercial sensitivity.

## Barking Riverside Extension

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
<b>2021</b>	<b>22</b>	*	*	*

2018/19 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 4.5km Barking Riverside Extension and we plan to start the main construction works in spring 2019. Demolition works were completed in May 2018 and we have procured the overhead line equipment sectioning and switching works that will be carried out over Christmas 2018. Preparations for these works are progressing well and we are working with Network Rail for the main contractor to take possession of its infrastructure, which is planned for 2019.

The budget milestone is red due to tender returns for the main works contract, which were received in July 2018. Due to bid returns from the two bidders being higher than anticipated, we reviewed the scope and value engineering opportunities on the programme. This will be included in a 'best and final offer' process, which

will conclude with a forecast contract award by December 2018. This will not impact the current completion date. The additional time for this process will support achieving the best commercial outcome for us.

### Assurance

Project Assurance completed an integrated assurance review on the Barking Riverside Extension programme submission to the Programmes and Investment Committee meeting in May 2018. A quarterly update was provided to the Committee on 11 October 2018 on the 10 recommendations that were made and accepted, including seven 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.

\* This information is withheld for reasons of commercial sensitivity.



The entrance to a new ticket hall at Victoria station

# Major stations

## Victoria station upgrade and finishes

Forecast completion year

**2018**

Spend to date (£m)

**568**

Spend authority (£m)

**660**

EFC (£m)

**581**

EFC movement post plan (£m)

**3**

2018/19 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.**

The EFC has reduced by £3m due to the reduction in financial risk provision as the project nears completion.

Three new escalators leading down from the south ticket hall were bought into use in August 2018, as well as reinstating the stairs linking the south ticket hall with the Network Rail station. This has relieved congestion by providing a new route from the south ticket hall to the Victoria line platforms via six further escalators.

We continue to rebuild the Duke of York pub, which was demolished to allow jet grouting works for the tunnels. Stud wall frameworks have been completed and the internal plastering and mechanical and engineering works are now well under way.

The new station is being opened in stages. Since the quarter close, all the new customer facilities have been opened. The overall completion of the station, surrounding buildings and urban realm are planned for mid-2019.

We achieved a major milestone this quarter as Victoria station became step-free. The new lifts are part of an upgrade project that has almost doubled the size of the station.

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## Bank Bloomberg Place

Forecast completion year

**2018**

Spend to date (£m)

**52**

Spend authority (£m)

**58**

EFC (£m)

**58**

EFC movement post plan (£m)

**0**

2018/19 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.**

The majority of the installation works are now complete across the new station entrance, with minor finishing works and cleaning to do. Final inspections are now taking place. We have started to integrate the fire and communication systems into the existing Bank station to ensure the new station entrance opens and operates safely.

We continue to work with the contractor on the remaining activities to ensure the new entrance opens at the end of 2018.



## Bank station upgrade

Forecast completion year

**2022**

Spend to date (£m)

**384**

Spend authority (£m)

**608**

EFC (£m)

**656**

EFC movement post plan (£m)

**(34)**

2018/19 budget milestone RAG



**We are increasing capacity at Bank station by 40 per cent, which will provide a quicker interchange, new Northern line southbound tunnel, new entrance and step-free access to the Northern and Waterloo & City lines. The project also includes asset integration on the DLR.**

We have completed 80 per cent of the tunnels and waterproofing of the new tunnels has started ahead of schedule. We have waterproofed the new Central line moving walkway link. The remaining tunnelling works are on schedule and should be completed prior to the Northern line blockade works.

We have completed the largescale top-down excavation of the new station box, marking a significant achievement for the project. The next phase involves starting the lift shafts for the new station entrance and ticket hall under the Bank project. Enabling works at the Northern line platform are almost complete and will create a connection between the existing and the new parts of the station.

Works to relocate the high voltage power supplies for the Central line were completed in mid-August. We removed the redundant power and transformer equipment, via engineer's trains ahead of schedule, releasing Central line shaft demolition works ahead of plan so that tunnelling works can begin in 2019.

A comprehensive EFC review, which commenced in January 2018, was concluded in this quarter. This has resulted in a revised EFC of £656m, an increase of £34m. The increase in EFC is driven by a number of factors including, prolongation, labour cost challenges and impacts from affected building owners. The project is committed to identifying opportunities to reduce this EFC and has a collaborative approach with the main contractor to identify opportunities and realise savings. Additional authority is being sought and will be funded through savings made in the Major Stations programme.

## Bakerloo line link (funded by Crossrail)

Forecast completion year

**2018**

Spend to date (£m)

**66**

Spend authority (£m)

**67**

EFC (£m)

**69**

EFC movement post plan (£m)

**(2)**

2018/19 budget milestone RAG



### **We are providing a new step-free pedestrian walkway at Paddington to link the Bakerloo line platforms with the new Elizabeth line station.**

The Bakerloo line link will provide a step-free link from the Bakerloo line to the new Paddington Elizabeth line station. Two new escalators and a new lift have been installed. We have completed the testing and commissioning works.

Crossrail has supplied permanent power, which enables us to remove the temporary power.

The Paddington Quarter scheme, which is a significant development managed by Sellar, has sought early handback of the Royal Mail Group building. Crossrail has successfully negotiated with Sellar, and the contractor has now vacated the building (apart from the front loading bay).

The EFC has increased by £1m this quarter and by £2m compared to the Business Plan. This was because of delays in the permanent power and cladding installation.

\* Crossrail funded, 100 per cent refunded, no provision made in Business Plan

## Holborn station capacity

Forecast completion year

**2028**

Spend to date (£m)

**4**

Spend authority (£m)

**5**

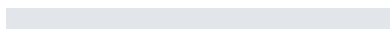
EFC (£m)

**5**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



**The proposed upgrade will see the station more than double in size, increasing capacity by around 140 per cent, as well as creating a new second station entrance and exit on Procter Street. Step-free access will also be provided as part of the plans, with the installation of three new lifts in the existing Kingsway entrance. Seven hundred metres of tunnel will create new interchange routes between the Central and Piccadilly lines, helping to cut down on crowding during peak periods.**

Tender documentation is being prepared to take the scheme forward through a Transport and Works Act Order, design and construction. We are also exploring opportunities to reduce cost by looking at lessons learned from the wider stations programme. This ensures the competitive dialogue phase remains focused on working within budget constraints.

The EFC represents early stage works including concept design and Transport and Works Act Order preparation and is aligned with the current spend authority.

## Camden Town station capacity upgrade

Forecast completion year

**TBC**

Spend to date (£m)

**10**

Spend authority (£m)

**24**

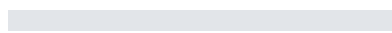
EFC (£m)

**24**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



**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.**

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, we have purchased a property on Kentish Town Road and we continue negotiations to purchase the redundant Hawley Infants School. We are exploring opportunities to reduce costs using lessons learned from the wider stations programme.

### Assurance

Project Assurance completed an integrated assurance review on the Major Stations programme submission to the Programmes and Investment Committee meeting in February 2018. A quarterly update was provided to the Committee on 11 October 2018 on the 15 recommendations that were made and accepted, including nine by IIPAG. Seven recommendations are closed and 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.

The EFC represents early stage works, including concept design and Transport and Works Act Order preparation along with property purchases and is aligned with the current spend authority. Work continues beyond this stage forming part of a wider EFC.

## Future projects



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

Under the chairmanship of Mike Gerrard, former Managing Director of Thames Tideway Tunnel, the Crossrail 2 Independent Affordability Review panel has reviewed the funding, finance, and cost and risk with the aim of making the project more affordable. The panel submitted an interim report to the Mayor and Secretary of State in the summer. Once they have considered and discussed the report they will decide the next steps.

We will then move to the next stage of development and proceed with further formal public consultation. Meanwhile, the team has been working with Network Rail on a programme of community engagement, including speaking to local stakeholders about level crossings and seeking views that will help us develop our proposals.

We continue to develop and refine the scheme and prepare to provide the government with an update to our business case in anticipation of the next phase of work.

The Bakerloo Line Extension from Elephant & Castle to Lewisham will increase capacity and resilience, 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 published a further response on 12 September 2018. We are now developing the scheme and engaging with stakeholders ahead of a further public consultation.

# London Underground

Stations  

Forecast completion year

**2022/23**

Spend to date (£m)

**1,979**

Spend authority (£m)

**3,141**

EFC (£m)

**2,440**

EFC movement post plan (£m)

**46**

2018/19 budget milestone RAG



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

## Integrated stations programme

We are improving a number of stations, including five that will interchange with the Elizabeth line. Work continues at Liverpool Street and Moorgate stations and will be completed by the end of 2018.

## Station enhancements

At Finsbury Park, we have started to install lifts to make the station step-free. Work has also started on a new passageway linking the existing station to the future western station entrance.

We have completed concept design for the South Kensington station capacity upgrade project and we continue work to appoint a design and build contractor later this year to deliver the works.

We will provide step-free access at Knightsbridge and build two new entrances on Brompton Road and Hooper's Court in partnership with a developer, who will enable and part-fund the works. We will start civils works on the lift shaft to the platform next quarter.

The EFC covers all projects, including those completed within the stations programme up to 2022/23. The increase of £76m from Quarter I mainly reflects the inclusion of the stations forecast for 2022/23.



We have started design work to redevelop Colindale station

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We continue the redevelopment and upgrade of Tottenham Hale station. Works to non-customer areas were completed on 7 November and foundation works are planned for completion later in 2018. Works above ground level will follow pending a resolution with the train operating company and Network Rail revenue protection issues.

We have started concept design to redevelop Colindale station and provide step-free access.

#### **Developer funded works**

We are working with Berkeley Group to create a new entrance at West Ham station with step-free access between the entrance and Berkeley's development site. The new entrance is critical to the development, which has been granted planning approval to provide retail, office and leisure space, and approximately 3,800 new homes. The detailed design is under way, with work planned to start on site in 2019.

#### **Systems**

The customer information systems enhancement project has recently installed new platform displays at locations including Temple, Fulham Broadway, Upney and Amersham. This will provide customers with accurate train information.

#### **Collaborative enhancements and third-party projects**

In July, the London Borough of Southwark recommended that planning permission be granted for a new town centre at Elephant and Castle, subject to legal agreement and approval by the Greater London Authority and the Secretary of State. We have been working to reach an agreement with the developer and Southwark Council (Section 106 agreement). As part of the development, a station box will be built to increase capacity at the existing station and provide step-free access to the Northern line.

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. Demolition works of buildings at street level continues and we are preparing for concept design for the new station entrance.

#### **Station capacity**

In July, we awarded the contract for feasibility studies to address capacity issues at Stratford station, the outputs of which are currently being reviewed.



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## Assurance

Project Assurance completed an integrated assurance review on the Stations programme submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 11 October 2018 on the eight recommendations that were made and accepted, including three by IIPAG. Three recommendations are 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.



New lifts provide step-free access at Victoria station

# Accessibility



Forecast completion year

**2022/23**

Spend to date (£m)

**27**

Spend authority (£m)

**244<sup>1</sup>**

EFC (£m)

**197**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



**We are working on a wide programme of accessibility improvements, customer service and information enhancements across the Underground network. We will make 36 per cent of stations accessible by 2020 by providing step-free access at a further 15 stations.**

We have announced the 23 stations that will be step-free by 2022/23. All of these stations are now being designed.

The first of the schemes at Buckhurst Hill became step-free to customers on 4 May 2018 and the completion works continue on site.

Since quarter end, step-free installation works were completed at Newbury Park. The station became step-free on 1 November 2018.

At Harrow-on-the-Hill, detailed design is progressing, with early drainage works planned to start in October to allow construction of the three platform lift towers. 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.

The amber milestone RAG relates to the delay in the construction contract being signed. The design and construction programme for South Woodford station has now been re-phased to ensure that step-free access is still delivered by the original date planned.

<sup>1</sup> An increase in programme authority of £98m was approved at the Programmes and Investment Committee on 3 July 2018 to fund the detailed design and delivery of the final 12 stations.

# Track renewals

Forecast completion year

**Annual**

Spend to date (£m)

**52**

Spend authority (£m)

**107<sup>2</sup>**

EFC (£m)

**107<sup>2</sup>**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



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

This quarter, we have replaced three point ends, 1.7km of ballasted track, 350 metres of drainage and 760 metres of concreted deep track.

We installed three new point ends at Wimbledon during the August Bank Holiday. The points were assembled and fully tested prior to delivery on site, where we used a Kirow crane from Network Rail to lower them into place from a nearby car park. This avoided the need to close the network elsewhere to transport materials.

In August, we replaced the track from South Kensington to Gloucester Road, taking the opportunity to reduce the vertical step between the trains and the platform.

We replaced more than 300 metres in a single weekend between Woodford and South Woodford and at Leytonstone in early September.

During a weekend closure in mid-September, we renewed:

- 160 metres of ballasted, covered track at King's Cross St Pancras. This work was logistically difficult as materials had to be taken to and from the work area along the single bore track being replaced instead of on an adjacent track
- Almost 200 metres from Moorgate to Farringdon. This included the replacement of floating slab track at Barbican, which reduces track noise for nearby residents

We installed almost 500 metres of slab track in the northbound tunnel from Baker Street to Finchley Road on the Metropolitan line to improve reliability, track drainage, reduce maintenance and increase track lifespan.

<sup>2</sup> The spend authority and EFC include £3m for hazardous materials, which was not included in the figures report at Quarter 1.

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The amber milestone RAG relates to a planned renewal of 7.5km of track on the Underground network by 31 March 2019. There have been scope reductions at some sites as a result of low availability of ballast wagons, tamping machines and locomotives, and we forecast to deliver the full 7.5km 14 days after the plan date. We have already identified work from next year's plans, which we are preparing to deliver later this financial year. The post quarter end update is that we have now recovered this delay and will deliver by the target date.

### **Assurance**

Project Assurance completed an integrated assurance review on the Track Renewals programme submission to the Programmes and Investment Committee meeting in February 2018. A quarterly update was provided to the Committee on 11 October 2018 on the seven recommendations that were made and accepted, none by IIPAG. Four recommendations are closed and good progress is being made to close the remaining three. Project Assurance tracks progress against the recommendations made as part of its continuous assurance.

# Power, cooling and energy

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
<b>2021/22</b> <sup>3</sup>	<b>38</b> <sup>3</sup>	<b>90</b> <sup>3</sup>	<b>180</b> <sup>3</sup>	<b>0</b>

2018/19 budget milestone RAG 

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

## Power

Having commissioned power works for the Elizabeth line at Liverpool Street, we are preparing for High Speed 2 power works, such as relocating the substation at Euston.

A strategy to upgrade and consolidate three power control systems that supply power across the Underground network to a single system has been endorsed. The systems remotely monitor and safely operate traction, station, signalling and depot power supplies. The subsequent project will address immediate obsolescence risk.

On the Central line, we have installed the rectifier transformer at South Woodford to provide a more reliable power supply.

We have commissioned high voltage cables at Kilburn Park, Ruislip and Park Royal and the construction of the Greenwich switchroom, which houses the additional power equipment, is almost complete.

We have initiated work to improve power asset condition through a prioritised work bank of projects.

## Cooling

We remain on schedule to complete major tunnel ventilation system upgrade works in late 2018 to mitigate temperature increases in Jubilee line tunnels between Baker Street and Green Park.

The commissioning of the Bond Street ventilation fan is now complete to bring it into use for the start of operation of the Elizabeth line.

The City Road ventilation upgrade has been commissioned, with the remaining works to be delivered by the London Borough of Islington in early 2019.

## Energy

We continue to assess the viability of installing solar panels and other energy conservation measures in our buildings and we are investing in waste heat and low carbon energy projects.

<sup>3</sup> 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)	EFC (£m)	EFC movement post plan (£m)
<b>2029</b>	<b>189</b>	<b>612<sup>4</sup></b>	<b>1,006<sup>5</sup></b>	<b>(52)</b>

2018/19 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 improvements to ensure continued reliability of the Bakerloo line fleet until its replacement by the Deep Tube Upgrade programme. We have completed structural weld repairs to carriages on 27 out of 36 trains and expect to complete the remaining trains by mid-2019.

flooring package. We continue to consider options to maximise efficiency, mitigate risks and complete installation works by March 2023. One initiative under consideration is to use some of our existing fleet of electrified Schoma engineering trains instead of buying new shunting capability.

On the Central line improvement programme, the new traction package contract continues on plan. We have awarded the contract for the saloon CCTV and the contract for LED lighting will be awarded imminently. We are evaluating tender responses for the

On the Jubilee line, 31 refurbished trains out of 63 trains are back in service. The refurbishments include a wheelchair area, new flooring, refreshed interior (including grab-poles and handles), new sealing to the roof and windows.

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

5 The EFC increase from £988m at Quarter I mainly relates to monies included in 2027/28 for the Northern line fleet extension, in 2028/29 for the Victoria line mid-life refurbishment and the Jubilee line fleet extension and for a new safety requirement for the Central line rail adhesion train.

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We are approaching the mid-point of the detailed design phase for 71 new wagons to support track renewal and maintenance activities.

We are designing and building specialised track renewal vehicles to reduce the cost of deep Tube track renewal and maintenance by automating the renewal process. As part of the concept design phase, an in-house team has created a virtual reality model of a prototype to allow potential hazards to be identified and designed out before the machines are built. We have also identified two trial locations for live testing, which is planned to start in early 2020.

We continue the detailed design of the modular points and crossings delivery system. We have, after an extended period, finalised the modification scope for the supporting tilting wagons, which are required to support the rail mounted Kirow cranes. They will also allow coupling to Network Rail locomotives to collect pre-assembled points and crossings units on National Rail infrastructure.

The tampers are performing well in operation and are expected to be handed over for full operational use from next quarter to carry out complex tandem points and crossings and plain line tamping.

Utility diversion works have been completed at the new train modification facility in Acton, which will be used for overhaul and heavy maintenance of rolling stock and engineering vehicles.

### Assurance

Project Assurance completed an integrated assurance review on the Rolling Stock Renewals programme submission to the Programmes and Investment Committee meeting in February 2018. A quarterly update was provided to the Committee on 11 October 2018 on the eight recommendations that were made and accepted, none by IIPAG. Three recommendations are closed and good progress is being made to close the remaining five. Project Assurance tracks progress against the recommendations made, as part of its continuous assurance.



# Signalling and control



Forecast completion year

**2021/22**

Spend to date (£m)

**63**

Spend authority (£m)

**143<sup>6</sup>**

EFC (£m)

**181**▲

EFC movement post plan (£m)

**0**

2018/19 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 Four Lines Modernisation or the Deep Tube Upgrade programmes. This ensures that they can continue to support a safe, reliable and maintainable service until then.**

A contract has been signed by Siemens Mobility for the life extension of the Central line signalling and control systems. Once the design has been finalised we will run a test pilot.

We have commissioned the new Piccadilly line signalling control system at the control centre in west London. Progress is being made towards completing snagging works in the building and the next commissioning, which will migrate control of Acton Town to South Harrow.

Tenders have been returned for the Northumberland Park re-signalling project and evaluation is planned to start in late October, with contract award recommendation expected in December.

## Assurance

Project Assurance completed an integrated assurance review on the Signalling and Control programme submission to the Programmes and Investment Committee meeting in May 2018. A quarterly update was provided to the Committee on 11 October 2018 on the nine recommendations that were made and accepted, including six by IIPAG. Three recommendations are closed and good progress is being made to close the remaining six. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

<sup>6</sup> Additional authority of £74m was granted by the Programmes and Investment Committee on 3 July, taking the total to £143m for works to 2023/24. Further authority will be sought in the future.



Highbury Corner will be made safer and more attractive

# Surface

## Healthy Streets

Forecast completion year

**2021/22**

Spend to date (£m)

**297**

Spend authority (£m)

**957**

EFC (£m)

**1,821**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG 

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

The EFC is unchanged despite the pedestrianisation of Oxford Street being cancelled by Westminster City Council. This is because the costs saved are being reinvested elsewhere in the Healthy Streets programme, including on projects to improve London’s cycling infrastructure.

### Westminster Bridge South

Construction works to alter the landscaped area around the Park Plaza Hotel to enable a pedestrian link along Westminster Bridge Road are on track for completion by end of December 2018. The main highway works were completed in December 2017.

### Highbury Corner

The construction works to remove the roundabout and replace it with a two way traffic system continues on site. The enabling works are now complete around the arboretum and on the forecourt area outside Highbury & Islington station, with a new pedestrian crossing on Holloway Road. The main works started in October and are scheduled to be complete in autumn 2019. We continue to work collaboratively with the gas provider undertaking emergency gas replacement works in the area, to minimise traffic disruption to the road network and impacts to local residents.

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### **Lambeth Bridge North and South**

We continue to work with Westminster City Council to find a suitable design solution to mitigate concerns over the proposed banned turns at the northern junction, while maintaining benefits to vulnerable road users. The delay in agreeing the concept design has impacted the programme, which means construction is now scheduled to start in mid to late 2020. The concept design for the southern junction is ready to proceed to detailed design. Work to accommodate utilities, trees and protective security measures along with surveys and studies is progressing to enable the designs to move promptly once the concept is agreed.

### **Wandsworth Gyratory**

The purchase of properties on Putney Bridge Road is in progress and targeted for completion in March 2019. The scheme layout in Armoury Way is being reviewed to reduce costs by ensuring all land-take is essential. Initial traffic modelling outputs indicate minimal traffic impacts as a result of the changes, but further work is required to understand the impact for pedestrians and cyclists. We plan to start work on site in 2021.

### **Fiveways**

We have confirmed the preferred alignment for our proposals at Fiveways in Croydon. This minimises the need to buy property and retains the existing A23 bridge, together with a new adjacent bridge structure. A compulsory purchase

order to acquire the essential land is planned to be submitted to the Board for approval in March 2020.

### **Vauxhall Cross**

The Island Site development, located in the middle of our highway and bus station, is due to go to Lambeth Planning committee in December 2018. Subject to them receiving planning permission, we will be able to secure the land required for our improvements through a land swap. Meanwhile, we are finishing the concept design, secured planning permission for the bus station and are preparing the detailed design and construction tender information, which is due for completion in March 2019.

### **Trinity Square**

Works are in their final phase. The new signals at the junction were commissioned on 22 June and the dedicated left turn into Trinity Square is now operational. Final resurfacing and demountable island installation has been delayed due to emergency gas works, but we are anticipating that all works will be completed by mid-November 2018.

### **Waterloo City hub**

We continue to develop the concept design, in response to feedback from public consultation and stakeholders, while working closely with Lambeth Council. The design proposal has been well received at the Independent Disability Advisory Group and the Mayor's London Review Panel. Further

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design work will be undertaken to address feedback, enable various design approvals and a planning application submission in spring 2019. Site surveys of utilities are nearly complete, and the principles for protective security measures have been established. Early contractor involvement has been initiated with the aim of reducing project risk, reviewing buildability of the design, assuring the estimated programme and costs. We expect to start construction works in spring 2020.

### **Old Street Roundabout**

We are continuing to investigate options to accelerate the scheme with our principal contractor. Concept design is substantially complete. We are now seeking approval for detailed design and construction to start in November. We have identified a package of enabling works to begin in late November 2018, ahead of the main works, currently scheduled to start in March 2019. An application for planning approval for the scheme will be submitted to Islington Council in November.

### **Direct Vision Standard**

The Mayor wants to make heavy goods vehicles (HGVs) coming into London safer for vulnerable road users, such as cyclists and pedestrians, to reduce the number of collisions and encourage the uptake in active travel. A request has been submitted to the European Commission to seek their support for our proposals to improve safety across London via the Direct Vision Standard.

### **Surface Intelligent Transport System**

We are leading the way in terms of delivering an innovative new road transport management system that makes journeys on foot, bike, bus, as well as essential emergency services and freight trips, as efficient as possible. We have appointed Siemens to help us take this ambitious project forward to the next stage.

### **Cycle Superhighways**

Following the completion of Cycle Superhighway 6 in late August, the Mayor officially launched the route on 20 September 2018. The project has introduced nine new pedestrian crossings and upgrades to seven existing pedestrian crossings, improved signal technologies at junctions, including energy efficient LED traffic signals, dedicated signals for cyclists at junctions and pedestrian countdowns.

The consultation report for Cycle Superhighways 9 (Kensington Olympia to Brentford), including responses to issues raised is currently being finalised. The concept design is on track for completion in January 2019. Construction of the Hammersmith Gyratory section of Cycle Superhighway 9 is expected to start in early summer 2019, subject to approvals with Hammersmith and Fulham.

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Detailed design for Cycle Superhighway 4 (Tower Bridge to Greenwich) started in early September 2018 and is progressing well, with the response to issues raised planned to be published later this year. Kerb alignment alterations have been finalised for our road section, which will reduce the amount of utility diversions required. Initial stakeholder meetings have also been held in October to review the proposed construction programme while minimising disruption.

Following the completion of the required surveys and investigations, detailed design on Cycle Superhighway 10 and the A40/Western Avenue has now started from Kathleen Avenue to Wood Lane, enabling the first phase of the design to be completed. Detailed design for this section is due to finish in December 2018. Strategic modelling for the remainder of the route began in April and initial results were received in July and are now being analysed.

The Cycle Superhighway 11 (Swiss Cottage to the West End) project team are currently reviewing options for the scheme following the recent High Court decision.

### **Bus stop bypasses**

The project to retrofit zebra crossings onto 43 bus stop bypasses on existing Cycle Superhighways is progressing well with 50 per cent of the detailed designs now complete. Construction of the first five sites will start in early November 2018.

### **Mini-Hollands**

Thirty-two of the Mini-Hollands schemes are complete, including the A105 Green Lanes scheme, a five kilometre protected cycle route linking Enfield Town to Palmers Green. A further 20 schemes are currently under construction, including segregated cycle routes on Wheatfield Way in Kingston, on the A1010 in Enfield and on Lea Bridge Road in Waltham Forest. There are 21 schemes currently going through design and consultation, including a number of Quietway links and Enfield Quieter Neighbourhoods.

Initial post-implementation monitoring of the A105 Green Lanes has shown a 42 per cent rise in cycling along this now protected cycling route, compared to surveys from 2014. We anticipate similar results for the first phase of the A1010 route between Ponders End and Edmonton Green, which will be completed early summer 2019.

There was further success for the Mini Hollands programme in Waltham Forest, which won the Best Healthy Street award for its scheme at Francis Road in Leyton. This has seen a part-time road closure implemented between 10am and 8pm. The 'Enjoy Waltham Forest' scheme also won The Best Healthy Streets Behaviour Change award for its complementary measures programme, which has seen more than 3,000 residents receive free cycle training.



The Central London Cycling Grid encourages more people to cycle

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### **Rotherhithe to Canary Wharf 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.

We continue with design development work on our provisional preferred option of a navigable bridge. Work is under way with stakeholders to determine a number of key aspects of the crossing, including preferred height, alignment and landing arrangements. This will lead to a second public consultation on our detailed proposals in 2019, which will help inform further development of the crossing ahead of a consents application, also planned for 2019.

### **Central London Cycling Grid**

We have completed 40km of the 85km Central London Grid network. This includes several sections of Quietway and Cycle Superhighway routes, such as Q13 (Broadway Market to Old Street), Q14 (Blackfriars to Tower Bridge) and Q15 (Earls Court to Belgravia). An additional four kilometres of network is currently under construction, including improvements to Sussex Gardens, which will be complete in December. These routes are due for completion by the end of 2018/19.

The Walking and Cycling Commissioner Will Norman launched Quietway 14, which runs between Cycle Superhighway 6 at Blackfriars and Tower Bridge Road. Improvements along the route include new cycle crossings and improved pedestrian facilities across Borough High Street and Tower Bridge Road. Union Street and Newcomen Street have also been partly closed to vehicles to stop rat running traffic along the Quietway.

A further 65km of potential Quietway routes have been identified and we have been working with boroughs to define more detailed plans. These include important routes such as the link between Cycle Superhighway 2 and 3 in Tower Hamlets, a link between Dalston and Bethnal Green via Queensbridge Road in Hackney and Kensington High Street to Notting Hill in Kensington and Chelsea. The Royal Borough of Kensington and Chelsea have completed consultation on their next Central London Grid route between Kensington High Street and Holland Park. The consultation was supported by more than 80 per cent of respondents. Construction is expected to begin on this route in early 2019.

### **Quietways**

Following the successful launch of Quietway 2 (east), post-launch monitoring showed that the route was used by 24,000 cyclists in the first week of opening.



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Since launching the eastern and western sections of Quietway 2, six more Quietways have been launched. These include Q3 (Gladstone Park to Kilburn), Q5 (Oval to Clapham Common), Q6 (Wanstead Flats to Barkingside), Q14 (Central London Grid: Blackfriars to Tower Bridge Road), Q15 (Earls Court to Belgravia) and Q22 (Stratford High Street to Newham Way).

Construction is complete or under way on 113km of a potential 250km network of routes.

Construction continues on Q4 (Clapham Common to Wimbledon), Q5 (Clapham Common to Norbury), Q7 (Elephant and Castle to Crystal Palace), Q21 (Wandsworth to Teddington), Q23 (Ealing to Greenford), a Quietway linking Barking town centre to Cycle Superhighway 3, Greenwich to Kent House Quietway, Bermondsey to Catford Quietway and Woolwich to Lee Green Quietway. Wayfinding has been installed across 46km of the Quietway network.

### **Safer Junctions**

We published a list of Safer Junctions in April 2017, which identified 73 junctions on our roads with the highest vulnerable road user collision rates between 2013 and 2015. We have been considering in detail how to make them safer. We have completed mitigation work at 26 of these junctions to reduce road danger. We are reviewing the completed projects to ensure they have been reduced collisions.

We are taking a further 47 schemes through design, with 15 of these scheduled for construction by spring 2020 (bringing the total to 41 out of the 73 junctions in the programme).

Works started at Charlie Brown's Roundabout in early August 2018 to make the area safer for people walking and cycling. New signal controlled toucan crossings will be installed on all arms of the roundabout, as well as measures including widened footways and central islands to encourage slower speeds at the roundabout and make the area feel less intimidating.

On 19 September, we partnered with Oakdale Junior School to mark the European Day Without A Road Death. This included a Walking Bus and Big Breakfast with 54 pupils who regularly cross Charlie Brown's Roundabout on their way to and from school. The event was a success and particularly poignant for many of the staff who volunteered, following the death of the mother of one of the pupils at the roundabout in 2016.

The extension to Cycle Superhighway 6 was also completed in September 2018, improving safety at two Safer Junctions locations. In addition to segregated cycle lanes replacing sections of traffic and bus lane on Farringdon Road and Farringdon Street, new traffic restrictions were introduced at the junction with Clerkenwell Road to help create better conditions for cyclists.

### **Crossrail complementary measures**

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

So far Crossrail complementary measures to introduce new public places for people to enjoy cycle parking, improved lighting and new pedestrian crossings are substantially complete at six stations (Hanwell, Romford, Chadwell Heath, Goodmayes, Abbey Wood and Manor Park). Site works at eight stations (Ilford, Harold Wood, Gidea Park, Seven Kings, Forest Gate, Maryland, West Ealing and West Drayton) are at an advanced stage. Three stations (Southall, Ealing Broadway and Acton Main Line) are at design/consultation stage.

### **Liveable Neighbourhoods programme**

This is a key part of the Mayor's Transport Strategy, which aims to create locally-led, attractive, healthy and safe neighbourhoods that encourage public transport use and reduce car journeys. The boroughs of Ealing, Greenwich, Hackney, Haringey, Havering, Lewisham and Waltham Forest were all successful in their initial bids for funding and will now develop their proposals to secure implementation funding for their schemes. There will be another round of funding allocation before the end of 2018, when other boroughs will be able to submit proposals for further Liveable Neighbourhoods funding.

### **Borough Local Implementation Plan projects**

Construction of the third phase of the Baker Street two-way traffic infrastructure scheme is ongoing, while construction also continues at Stratford, Beckenham Town centre, Beddington, White Hart Lane, Feltham, and Tottenham Court Road. Works at Bond Street are nearly complete.

Boroughs are working on their third draft Local Implementation Plans, which will be submitted to us for assessment and subsequently approved by the Mayor in early 2019.

### **Assurance**

Project Assurance completed an integrated assurance review on the Healthy Streets programme submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 11 October 2018 on the nine recommendations that were made and accepted, including four by IIPAG. Four recommendations are 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.



The Liveable Neighbourhoods programme aims to create healthier, safer streets

# Air quality and environment



Forecast completion year

**2023/24**

Spend to date (£m)

**153**

Spend authority (£m)

**202**

EFC (£m)

**527**

EFC movement post plan (£m)

**3**

2018/19 budget milestone RAG



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

## ULEZ update

From April 2019, the central London 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, the zone 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 completed the design and development of the core IT system, with development of our website well under way. We have started testing to ensure that the systems integrate correctly, with system integration testing in progress and regression and performance testing to follow in Quarter 3. We are also taking action to ensure we maximise vehicle compliance (to the required standards) and have started a comprehensive communications and stakeholder engagement strategy

The EFC has increased by £3m and is driven by the ULEZ expansion in 2021 increasing by £4m due to higher transition costs and risk provision as requirements become more refined. This is offset by a reduction in the bus nitrogen dioxide retrofit project of £1m through reduced contract.

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## Fleet compliance

There are now more than 2,200 ULEZ compliant buses (both single and double deck) in service. As a result, more than 80 per cent of the bus fleet travelling in the zone is already compliant with the new emission standards.

We continue to install nitrogen dioxide (NOx) abatement equipment on buses. We have completed seven Low Emission Bus Zones with the retrofitted vehicles now contributing significantly lower NOx emissions on these corridors. Bus zones completed include:

- Putney High Street
- Brixton – Streatham
- A2 Camberwell – New Cross
- A3 Wandsworth – St. John’s Hill
- High Road (Haringey)
- A12 Eastern Avenue (Homerton Rd)
- A5 Edgware Road

The Edmonton to Seven Sisters corridor is more than 90 per cent complete and the Stratford corridor is 70 per cent complete. In addition to vehicles operating in the ULEZ, we are also retrofitting NOx abatement equipment on buses across London. More than 2,000 buses have already been converted, which are directly delivering benefits for the Mayor’s programme to improve air quality. At the National Air Quality Awards in October, the Low Emission Bus Zone programme won Passenger Transport Air quality Initiative of the Year.

## 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 across London. We had installed 135 points by 12 October, of which 60 are dedicated for taxis.

We continue to prepare sites for installation, with the number of live sites scheduled to increase to 150 by the end of 2018 and 175 by April 2019. We are also progressing designs for two ‘hub’ sites with multiple rapid charging points and aim to have the first site live by mid-2019.

## Assurance

Project Assurance completed an integrated assurance review on the Air Quality and Environment programme submission to the Programmes and Investment Committee meeting in October 2017. Eleven recommendations were made and accepted, including three by IIPAG. A quarterly update was provided to the Programmes and Investment Committee meeting on 11 October 2018. Two recommendations are closed and good progress is being made to close the remaining nine. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

# Asset investment



Forecast completion year

**2021/22**

Spend to date (£m)

**203**

Spend authority (£m)

**352**

EFC (£m)

**631**

EFC movement post plan (£m)

**0**

2018/19 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.**

## Structures and tunnels investment programme

We achieved a significant milestone in the Ardleigh Green Bridge replacement project with the second half of the new bridge launched over the railway at the end of August 2018.

We are now building the carriageway approaches to the new bridge ahead of the final phase of demolition at Christmas 2018, and plan to open all four lanes to traffic on schedule in spring 2019.

Works continue to build the carriageway approaches to the new bridge at Power Road and the project remains on schedule to be completed in November 2018.

This is the first year without any Government operating grant. As a result, the programme of proactive capital renewals on the road networks has been stopped in the short to medium term, although the safety of the network will be maintained. In the medium to long term, new sustainable funding sources for London's roads will need to be identified.

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### **Woolwich Ferry**

We are replacing the three existing ferries with two new ferries that will be more reliable and environmentally friendly. As part of the project, we are also upgrading the mooring facilities. The ferry service closed on 5 October 2018 and the three former ferries were sold to a marine recycling facility.

The two new vessels arrived at Tilbury in early November for crew familiarisation and Maritime and Coastguard Agency approval and certification. Following this, they have been undergoing berth alignment and commissioning trials at Woolwich, testing the integration and operation of the mooring and control systems. On successful completion of the trials, the ferry service is expected to re-open by the end of December 2018.

### **Coaches**

We are working to ensure that Victoria Coach Station is maintained and fit for purpose. This includes a fire system upgrade, improvements to customer information display systems and refurbishment of the existing ticket office.

### **Bus driver facilities**

This project aligns with the Mayor's Transport Strategy by ensuring that the bus network is operationally efficient and reliable.

Good progress has been made since the Mayor announced increased funding for bus driver facilities in February. A total of 10 facilities have been installed to date and a further 10 are planned to be in place by the end of December 2018.

We are currently working to deliver facilities on 42 routes by April 2020. The majority of these new facilities will be standalone permanent toilet units, adjacent to the bus stands where they are required.

### **Assurance**

Project Assurance completed an integrated assurance review on the Asset Investment programme submission to the Programmes and Investment Committee meeting on 11 October 2018. Twelve recommendations were made and accepted, including five by IIPAG. Good progress is being made to close the recommendations. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

# Public transport

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
<b>2022/23</b>	<b>134</b>	<b>268</b>	<b>390</b>	<b>0</b>

2018/19 budget milestone RAG

**We maintain the safety, reliability and performance of London Buses, London Overground, 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

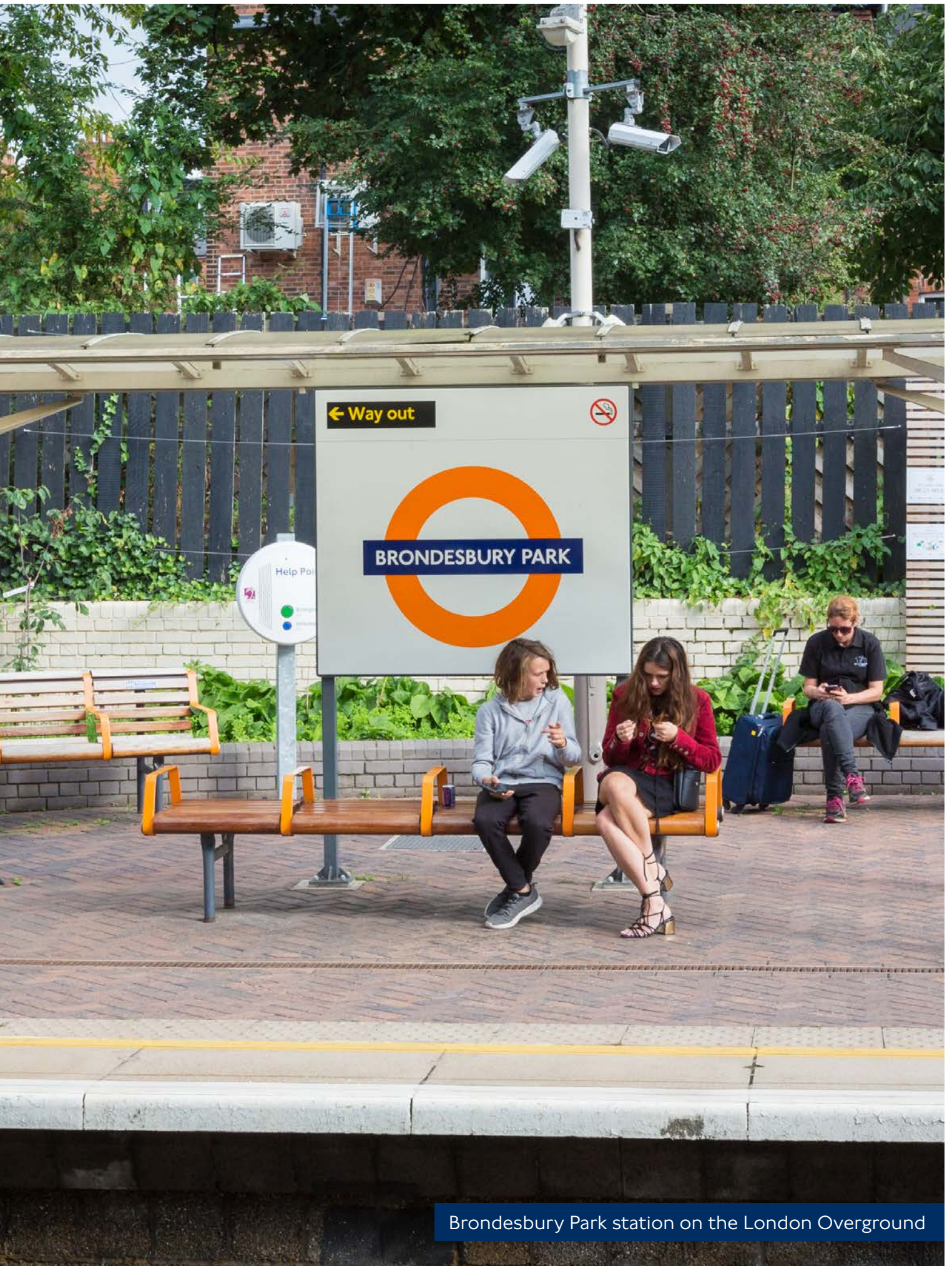
'Access for all' schemes are under way at West Hampstead and White Hart Lane stations. We are also acting as delivery partner to Crossrail to design and construct schemes at seven stations across the eastern and western sections.

In preparation for the introduction of the new London Overground rolling stock, we have extended the platforms on the Gospel Oak to Barking line, 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

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 (National Rail) 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.





Brondesbury Park station on the London Overground

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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 on the B2007 vehicle fleet.

We continue to upgrade 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.

The new roof at Custom House to the mezzanine is now in place – with 30 per cent of the glass panels forming the mezzanine level balustrade remain to be completed. Electrical and communication equipment installations are in progress on the upper level and we have started ceiling cladding works.

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**

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

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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.

The renewals programme consists of 17 projects across seven asset groups including fleet, power, and permanent way infrastructure.

We are progressing with overhauls of the vehicle hydraulic power units and brake callipers on the CR4000 fleet.

Replacement of the parafil support wires, which hold up the overhead power lines, started in September. We are currently procuring a supplier to help rebalance power within the tram depot to more evenly distribute the supply.

London Trams went cashless in July. The existing ticket machines, which date to the opening of the system, will be removed and the newly available space at our tram stops will provide additional platform capacity, seating and/or information boards, depending on location. We will start removing the machines in December, starting with town centre locations.

In conjunction with removal of the ticket machines, work is under way to improve the visibility and locations of card validators across the tram 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 the location of existing validators at a number of tram stops. These improvements will be phased, starting with East Croydon later this year.

Work to reinstate automated operation of the points at East Croydon tram stop has progressed through Quarter 2 and is nearly finished, with functional completion expected by December of this year. This will improve local operations at East Croydon and increase the resilience of the tram network, particularly in the town centre.

A revised programme for completing the outstanding works at Wimbledon is currently awaited from Network Rail.

Detailed design for the replacement of two Victorian bridges at Blackhorse Lane has been completed by Morgan Sindall and is under review. Most of the construction work is scheduled to take place in 2019, with the work forecast for completion in 2020.

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### Sponsored services

The cycle hire renewals programme includes payment software, on-street equipment, bike replacement, docking station relocation and map updates.

All 775 terminals are being upgraded, enabling customers to use their contactless bank card, rather than chip and pin. The new system will accept all major UK and international cards, making hiring a bike quicker and easier.

The current payment solution support contract expires in November 2018. We have identified the desired replacement solution and have almost finished the detailed design for the new on-street keypads and payment software.

### Buses

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 new buses entering the fleet are compliant. 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 driver safety training.

We are working with operators to understand and address driver fatigue and are commissioning independent research into this issue.

### Assurance

Project Assurance completed integrated assurance review on the Public Transport programme submission to the Programmes and Investment Committee meeting in December 2017. A quarterly update was provided to the Committee on 11 October 2018 on the eight recommendations that were made and accepted, none by IIPAG. Four recommendations are closed and good progress is being made to close the remaining four. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.



London streets support a number of transport modes



We have updated our Oyster programme

# Other

## Technology and data

Forecast completion year

**2019/20**

Spend to date (£m)

**24**

Spend authority (£m)

**168**

EFC (£m)

**150**

EFC movement post plan (£m)

**18**

2018/19 budget milestone RAG



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

### Payments

We updated contactless functionality in our Oyster and Contactless apps to enable customers to add a contactless card to their account in August 2018.

The technical readiness for deploying weekly capping for Oyster customers was completed in September 2018. This is dependent on completing our negotiations on acceptance with the train operating companies.

### Enterprise resource programme

We plan to move away from expensive investment programmes every five to eight years by upgrading our desktop hardware and software with a more 'evergreen' model of continually refreshing and updating. This will lower our overall cost of ownership and reduce operational risks associated with technology obsolescence. It will also support our smart working initiatives and enable employees to work more flexibly.

### Evergreen programme

To better manage project dependencies and risks, the Modern Desktop, Windows 10, Skype for Business, Azure Mobile Components and Office 365 deployment projects have been moved to a single programme – Evergreen.

EFC is for the financial years 18/19 and 19/20. EFC is net of the Data Centre Consolidation Fund Credit of £16.75m, which is included in the spend authority amount.

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We have completed the initial build of Windows 10 and Office Pro Plus and tested it on thick clients. These have been deployed to 60 early adopters within Technology and data. The first 100 Windows 10 laptops were successfully deployed to the smart working pilot users.

We have started migrating business critical and the top 40 launched applications (total of 173) to Windows 10, with three identified for de-commissioning. We also continue to roll out multi factor authentication software to replace the remote secure access token fobs for remote connectivity to our network. So far, more than 9,000 users have been enrolled.

### **Content and collaboration**

A new blog has been setup on WordPress Software as a Service, with the look and feel updated to reflect our internal identity. This replaces a bespoke London Underground blog, which was custom built for us more than 10 years ago and was no longer fit for purpose, with expensive support costs. We have trained bloggers and administrators and the new blog launched successfully to staff at the end of August.

SharePoint Legacy Consolidation assessment of the current estate is complete and ready to progress to the next stage of migration. We have a SharePoint estate that includes a significant number of sites and content in older versions, which presents significant, cost, complexity and risk.

### **Operating and monitoring systems**

The topographical assessment is a test for those who want to become licensed London private hire drivers approved to operate by us.

Working in collaboration with two external suppliers we have delivered a new Taxi and Private Hire Online Assessment Tool. This replaces the paper-based test with an online assessment. It will be used by eight test centres in London to assess approximately 350 taxi and private hire drivers per week. The new system requires less manual effort to score and audit, creating a fair, consistent and cost-effective testing experience. One test centre is live, with two more scheduled by mid October 2018.

We have installed 6,000 buses with new equipment under the surface radio replacement project.

As part of the Future Bus System project, a contract has been signed with Trapeze UK for the replacement system of our obsolete bus scheduling tools: busnet, SSTT and Caesar. This will provide an efficient platform for capturing bus service changes and disruption information. The new software and tools will ensure we continue to run a reliable, accessible and high-quality bus network across London.



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## Hosting – data centre rationalisation and cloud migration

Work is under way to cut 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. We are expanding these capabilities to deliver stronger governance, operational controls and cost transparency to yield additional efficiencies.

With the successful pilot migration of four applications from on-premises to the public cloud and the build out of the enterprise service hub for managing 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

As part of adopting the European Union directive on security of networks and information systems, known as the NIS Directive, into UK law, we have been identified as the Operator of Essential Services across a number of transport capabilities we deliver. The network and information systems underpinning these services need to be assessed as part of this legislation. We have worked with the Department for Transport and the National Cyber Security Centre to

conduct a pilot of the Cyber Assessment Framework across two of the systems within NIS scope, working collaboratively with the competent authority to refine the assessment approach.

## Data and analytics

We have built the capability to store Elizabeth line asset data, providing the ability to do future analysis of data once trains are in service.

We are providing analytic services that underpin London Underground's Visualisation programme. We continue to work with the performance analysis and improvement programme and have created various reports and system changes in the past quarter.

## Networks

We transitioned the management of our largest above-ground network from the Fujitsu Core IM contract to our new strategic agreement with Capita on 9 August 2018. This was completed with very minor disruption to two low-criticality sites. Work has started on implementing the new core network, and we are on track to migrate the first pilot sites to the new network before the end of 2018.

We signed a four-year contract (extendable to seven) with Thales for continued support of the services currently provided under the Connect private finance initiative. This new contract will enable us to keep the Connect radio and fixed

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telecommunication system running without any breaks, which is essential for the operation of the Underground. It will also provide the technology upgrades urgently needed to bring the system up to date. It will reduce our operating costs on Connect to less than half of what we pay today, down nearly £40m per year, and will provide the upgrade of the radio system.

The deployment of infrastructure to support the Home Office's nationwide Emergency Service Network programme continues. Within the 422km of in-scope tunnels, we have now installed fibre optic cable in 173km and placed leaky feeder in a temporary position in 251km (of which 30km has been fixed into its final position). Cabling works at the first 25 stations is 70 per cent complete. The current phase of delivery will complete in December 2018, by which time we will agree funding with the Home Office for the next phase.

### Contact centre operation

The contact centre operation replacement project is now complete. This included the delivery of a secure reporting solution, which also meets all the data retention and the new GDPR requirements.

We have decided to extend the self-serve telephony contract until June 2020. This aligns the contract end to the telephony touchtone contract, which we planned to achieve savings by merging the two contracts when we re-tender.

In view of issues with the Baker Street site, we have been seeking a suitable alternative site for the Lost Property Office. One has now been identified that meets accessibility requirements. We are preparing to test the market for a cheaper operating model.

After a successful tender process, we have now awarded outsourcing of all Oyster correspondence/email enquiries at a saving of £95k per annum.

### Assurance

Project Assurance completed an integrated assurance review on the Technology and Data programme submission to the Programmes and Investment Committee meeting in February 2018. A quarterly update was provided to the Committee on 11 October 2018 on the 11 recommendations that were made and accepted, including seven by IIPAG. Six recommendations are 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.



We have completed our contact centre replacement project

# TfL Growth Fund



Forecast completion year

**2021/22**

Spend to date (£m)

**0**

Spend authority (£m)

**200**

EFC (£m)

**200**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



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

## Existing Growth Fund schemes

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

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

## 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.

Programme authority of £200m was approved by the Programmes and Investment Committee on 28 June in Quarter 1 2018/19. There has been £400k spent on Walthamstow Central.

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### Shortlisted schemes

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

- An upgrade at Elmers End station to provide double tracking, and a second platform to support growth along the London Trams 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 Greater London Authority 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 on the Growth Fund submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 11 October 2018 on the 11 recommendations that were made and accepted, including four by IIPAG. Good progress is being made to close the recommendations. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance.

# Elizabeth line



## On-network stations improvement programme

Forecast completion year

**2019**

Spend to date (£m)

**55**

Spend authority (£m)

**94**

EFC (£m)

**94**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



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

On the Great Eastern section, lifts have been installed and tested at Maryland, Manor Park and Seven Kings ahead of opening for customer use. All testing at Manor Park and platforms 1, 2 and 3 at Maryland was completed at the end of July 2018. We are aiming to complete the bridge structures and bring the lifts into use by winter 2018, by continuing to work with the contractor and manage slippages.

On the Great Western section lift design works at Hanwell, Iver, Langley and Taplow are continuing and IDCs (80 per cent design checks) were completed in June 2018. Site mobilisation has started, with construction due to start in autumn 2018.

MTR Crossrail is continuing its station refurbishment programme. The platform canopies at Chadwell Heath and Goodmayes have been repaired and decorated and 200 new benches have been installed at TfL Rail stations along the Elizabeth line route.

Since summer 2018, new waiting shelters have begun to be installed at stations on the Great Eastern section. Work will also begin to refurbish the station buildings on the Great Western section that are not being upgraded by the Crossrail project and design for these works is progressing well.

## Rolling stock

Forecast completion year

**2019**

Spend to date (£m)

**912**

Spend authority (£m)

**1,149**

EFC (£m)

**1,035**

EFC movement post plan (£m)

**138**

2018/19 budget milestone RAG



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

Class 345 seven-car trains are operating on the TfL Rail service between Liverpool Street and Shenfield, and between Paddington and Hayes & Harlington.

Testing of the Class 345 units fitted with the European Train Control System, needed for operation to Heathrow Airport, has continued. Class 345 trains are also being used for dynamic testing of the central tunnel section of the Elizabeth line, the intensity of this testing will increase, with more trains being used.

Signalling and train software is being updated progressively to improve reliability ready for the Elizabeth line entering trial operations and passenger service in the central sections next year.

The new depot at Old Oak Common is fully operational and is being used for driver training and as the base for Class 345 fleet.

The EFC has increased by £18m this quarter, due to the accelerated rolling stock production prior to the sale and lease back of the rolling stock fleet.



We are look at a revised construction schedule for the Crossrail project



# Crossrail

## Crossrail

Forecast completion year

**2019**

Spend to date (£m)

\*

Spend authority (£bn)

**15**

EFC (£m)

\*

EFC movement post plan (£m)

\*

2018/19 budget milestone RAG



**The Crossrail project will create 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 our services open through central London, it will be known as the Elizabeth line.**

On 31 August, Crossrail Limited announced that it would not meet the December 2018 opening date for the central section of the Elizabeth line and that the central tunnelled section (between Paddington and Abbey Wood) is expected to open in autumn 2019. The Department for Transport and ourselves, as joint sponsors, have commissioned independent reviews into Crossrail Limited's schedule and financing to ensure it is robust and into its governance. These are being undertaken by KPMG and the outcomes will be published when they are complete.

A revised schedule is needed to complete construction, which then allows for full testing and commissioning. The focus remains on opening the full Elizabeth line – from Reading and Heathrow in the west to Shenfield and Abbey Wood in the east – as soon as possible after the central tunnels open.

\* This information is withheld for reasons of commercial sensitivity.

# Appendix

## 2018/19 Budget milestone performance

The TfL 2018/19 Budget milestones for the projects or programmes covered in this report are listed below. The RAG status indicates delivery forecast against the current plan date in line with the following key:

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

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

Milestone description	Plan date	Actual/ forecast date	Status
<b>Major Projects</b>			
<b>Four Lines Modernisation</b> <span style="color: #FFD700;">■</span>			
Train services on Hammersmith & City line use new signalling system between Hammersmith and Latimer Road	21-Oct-18	23-Sep-18	<span style="color: #FFD700;">■</span>
Train services on Hammersmith & City line use new signalling system between Ladbroke Grove and Paddington	18-Nov-18	21-Oct-18	<span style="color: #FFD700;">■</span>
Post quarter end update: Due to a signalling software issue identified during summer 2018, we have not met the milestones above. We have completed an in-depth review of the software to ensure any risk that could impact the reliability and operating of the network is minimised prior to commissioning. It is most likely that both the milestones will fall in quarter one of the calendar year 2019, but due to the requirement of network closures for commissioning we are conducting a full schedule review to ensure minimal impact to customers. Timetable data will not be impacted.			
<b>Deep Tube Upgrade programme</b> <span style="color: #006633;">■</span>			
Preferred bidder for new Piccadilly line rolling stock contract determined	12-Jul-18	15-Jul-18	<span style="color: #006633;">■</span>
Tenders returned for signalling and train control contract	15-Mar-19	26-Oct-18	<span style="color: #006633;">■</span>
<b>Network extensions</b>			
<b>Northern Line Extension</b> <span style="color: #006633;">■</span>			
Nine Elms station civil works complete	26-Sep-18	25-Sep-18	<span style="color: #006633;">■</span>
Kennington station cross passage civil works complete	17-Sep-18	17-Sep-18	<span style="color: #006633;">■</span>

Milestone description	Plan date	Actual/ forecast date	Status
<b>Silvertown Tunnel</b> ■			
Preferred bidder selection dependent on national government support	28-Jan-19	01-May-19	■
<p>Q1: 93 days late ■</p> <p>Q2: 93 days late ■</p> <p>The contract award has been delayed by five months until July 2019 as additional ground investigation surveys had to be done. However, the remaining land surveys were delayed due to the development consent order postponement affecting private land access, which resulted in an increased time to complete arrangements. Surveys are now complete and will inform the bidders' final technical submission, which is expected at the end of January 2019. The first stage of technical submissions were delivered in July and we are evaluating them.</p> <p>This delay will directly impact the selection of preferred bidder status, which moves the current forecast date from November 2018 to May 2019. The programme will be clarified once the bids are returned.</p>			
<b>Barking Riverside Extension</b> ■			
Early works contract – completion of all early works	27-Jul-18	20-Jul-18	■
Main works contract – supplier evaluation and award recommendation complete	18-Jul-18	31-Jan-19	■
<p>Q1: 197 days late ■</p> <p>Q2: 197 days late ■</p> <p>The GRIP 5 signalling design, low voltage power and other design elements were not completed on time to support the invitation to tender issued on 13 April 2018. To avoid delaying the major works contract tender documents, the GRIP 5 signalling design was issued in advance. Both bidders requested an extension of four weeks to the tender period to review the designs issued after the ITT date, which was granted.</p> <p>Overhead line electrification switch works planned for Christmas 2018 will be impacted by late award of contract due to reduced mobilisation time for the successful main works contractor. These works are being procured as a separate package to mitigate the impact to completion dates.</p>			
<b>Major stations</b> ■			
Bank station: preparatory power works complete to allow the start of tunnelling for new escalators	03-Oct-18	15-Aug-18	■
All Victoria station passenger facilities available for use	03-Dec-18	15-Oct-18	■
Bakerloo line link passage ready for Crossrail trial running	30-Nov-18	27-Nov-18	■

Milestone description	Plan date	Actual/ forecast date	Status
<b>London Underground</b>			
<b>Stations renewals and enhancements</b> ■			
Improvement works complete at Underground stations that interface with the Elizabeth Line	09-Dec-18	15-Nov-18	■
Finsbury Park is a step-free station	20-Mar-19	31-Dec-18	■
<b>Accessibility</b> ■			
Buckhurst Hill is a step-free station	09-May-18	04-May-18	Complete
Newbury Park is a step-free station	26-Oct-18	01-Nov-18	■
<p>Q1: 24 days late ■</p> <p>Q2: 4 days late ■</p> <p>Milestone achieved post quarter end on 1 Nov.</p>			
South Woodford is a step-free station	15-Mar-19	09-Aug-19	■
<p>Q1: 14 days late ■</p> <p>Q1: 147 days late ■</p> <p>Additional site constraints have been identified for the station access ramps. The constraints identified have impacted the design programme and have caused delays</p>			
<b>Track renewals</b> ■			
Install 7.5km of new track across the Underground network	31-Mar-19	14-Apr-19	■
<p>Q1: On time ■</p> <p>Q2: 14 days late ■</p> <p>The 14 day delay has been caused by the low availability of TransPlant ballast wagons, tamping machines and locomotives.</p> <p>A recovery plan has been implemented post-quarter end to maximise access, mobilise additional crews and secure materials. We are confident that it will be in place next quarter and that the milestone will be achieved before the year-end target date.</p>			
<b>Rolling stock renewals</b> ■			
75 per cent of Bakerloo line fleet refurbishment works complete	31-Dec-18	24-Oct-18	■
50 per cent of Jubilee line fleet mid-life refurbishment works complete	31-Dec-18	07-Nov-18	■

Milestone description	Plan date	Actual/ forecast date	Status
<b>Surface</b>			
<b>Healthy Streets</b> ■			
Cycle Superhighway North South – Phase 2 from Stonecutter Junction to Judd Street complete. This completes the CS6 route, running from Elephant and Castle to Judd Street	23-Dec-18	30-Sep-18	■
Old Street roundabout – start advance works on site	22-Feb-19	12-Nov-18	■
Mini-Hollands – 4.5km of segregated or semi-segregated cycle route across Kingston, Waltham Forest and Enfield complete	31-Mar-19	31-Mar-19	■
Cycle Quietways Borough – construction of 25km of the total 250km completed in 2018/19	31-Mar-19	31-Mar-19	■
Liveable Neighbourhoods – feasibility stage complete for three of the seven boroughs that received feasibility funding in 2017/18	31-Mar-19	31-Mar-19	■
Highbury Corner gyratory – start construction	31-Aug-18	28-Jun-18	■
Highbury Corner bridge – construction complete	31-Aug-18	13-Jul-18	■
<b>Air quality environment</b> ■			
Bus retrofit – Four Low Emission Bus Zone routes complete: <ul style="list-style-type: none"> <li>• A2 Camberwell – New Cross</li> <li>• A3 Wandsworth – St John’s Hill</li> <li>• A5 Edgware Road</li> <li>• Edmonton – Seven Sisters</li> </ul>	31-Mar-19	03-Mar-19	■
<b>Growth fund</b> ■			
Sutton Tram extension – consultation launch	30-Nov-18	30-Nov-18	■
<b>Technology and data</b> ■			
Heathrow extension – extension of Oyster and contactless acceptance to Heathrow	27-Jul-18	27-Jul-18	■
Future Ticketing Programme 4 – delivery of weekly capping for Oyster customers	21-Dec-18	21-Dec-18	■
Ticket vending machine – new ticket vending machines to support Elizabeth line central service installed and ready for operation	31-Dec-18	31-Dec-18	■

Milestone description	Plan date	Actual/ forecast date	Status
<b>Commercial development</b> ■			
Announce Elizabeth line partners	31-Oct-18	28-Sep-18	■
Deliver a signed contract for the commercialisation of the telecommunications assets, including the delivery of public cellular services on the Underground	14-Dec-18	15-Apr-18	■
<b>Q2: 123 days late</b> ■			
<p>The Home Office, which is part funding this project, requested a change to the scope of the project. Subsequently a second change request was received adding additional delays. Our Executive Committee also requested additional financial modelling, which extended the time required to prepare the business case required before the tendering exercise could continue.</p> <p>The ITT was delayed, which delayed the procurement process for the preferred supplier and subsequent contract signature.</p> <p>We are reviewing the different investment models to be considered at the Exco Investment Committee in November 2018. Following its decision, the programme will be re-profiled. In the meantime, the early procurement activity has progressed well and the results of the SSQ will be announced shortly.</p>			
Submit planning application – Kidbrooke	04-Feb-19	26-Oct-18	■
Submit planning application – Blackhorse Road	29-Mar-19	17-Aug-18	■
<b>Elizabeth line integration</b>			
<b>Rolling stock</b> ■			
Elizabeth line passenger services start on central section between Paddington and Abbey Wood	Dec-18	Autumn 2019	■



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