

# Transport for London investment programme report

Quarter 3 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 Docklands Light Railway, London Overground, TfL Rail, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the Emirates Air Line. The quality and accessibility of these services is fundamental to Londoners' quality of life. By improving and expanding public transport, we can make people's lives easier and increase the appeal of sustainable travel over private car use.

We are moving ahead with many of London's most significant infrastructure projects, using transport to unlock growth. We are working with partners on major projects like Crossrail 2 and the Bakerloo line extension that will deliver the new homes and jobs London and the UK need. We are in the final phases of completing the Elizabeth line which, when 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 that use them every day.

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

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

# Introduction

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

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:



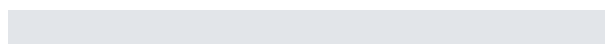
Up to 89 days late:



90 or more days late:



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







Our investments will support the Mayor's Healthy Streets aims

Budget milestones for 2018/19 – the key milestones listed in the TfL Budget – are detailed in Appendix A (page 90).

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 26-40 of this report. Future Major Projects schemes (see page 41) 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 on pages 42-55
- Surface Transport comprises Healthy Streets, air quality and environment, public transport, and asset investment. These are covered in pages 56-77
- Other comprises technology and data, Growth Fund, and the Elizabeth line (including Crossrail), which are covered in pages 78-89

# 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

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

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

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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**







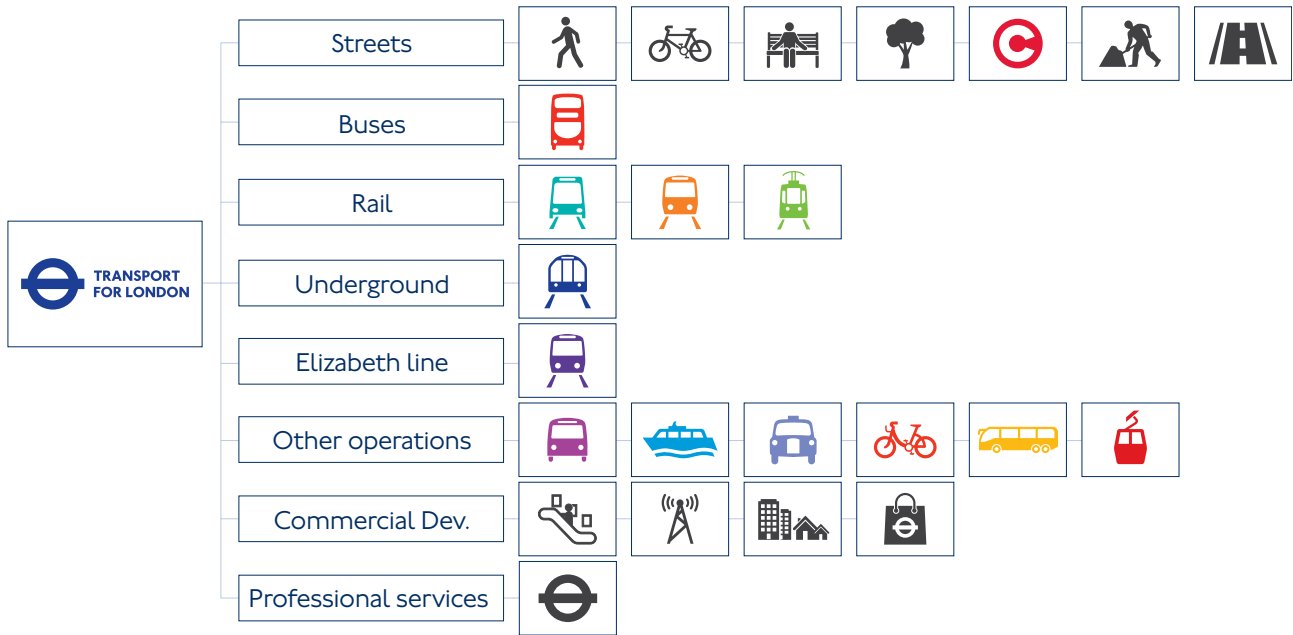
We are working to make cycling a safer and more appealing option



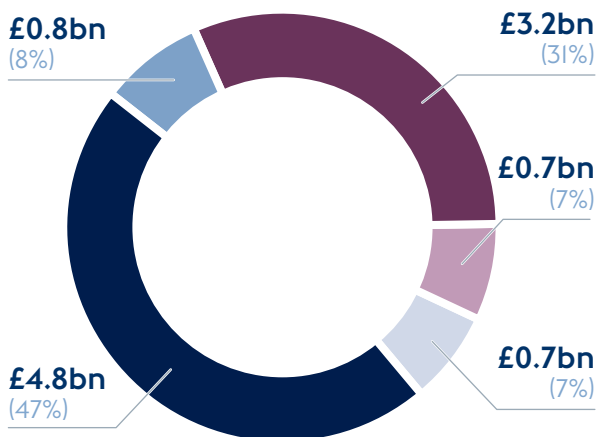
# Business at a glance

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

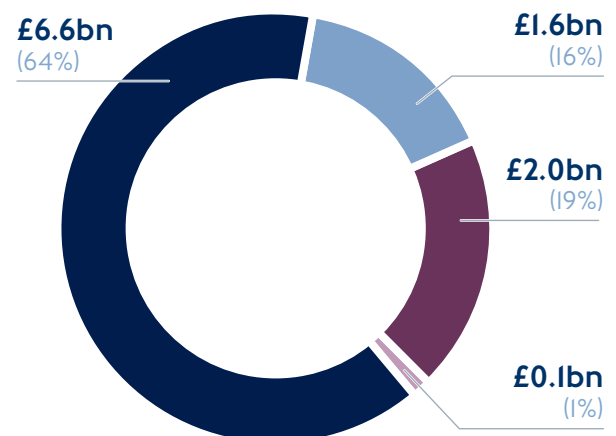
## How we report on our business



**Figure 3: Sources of funding**  
2018/19 – projected



2023/24 – plan



Total: **£10.2bn**

Total: **£10.3bn**

■ Passenger income   ■ Grant funding   ■ Other income   ■ Property and asset receipts   ■ Use of borrowing and cash reserves

The 2018/19 grant funding includes Crossrail funding sources

Facts and figures

By 2023/24...

**790km**  
of track on our rail and Underground routes (from 725 km in 2018/19)



**100%**  
of the bus fleet will have Euro VI engines (from 65% in 2018/19)

**2** new, auto-mooring, accessible, hybrid-powered ferries



**985**  
trains on our network (from 970 in 2018/19)



**32,000**  
daily cycle hire journeys (from 29,000 in 2018/19)

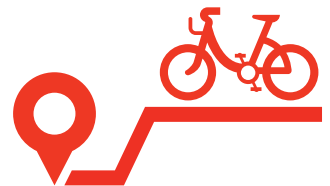
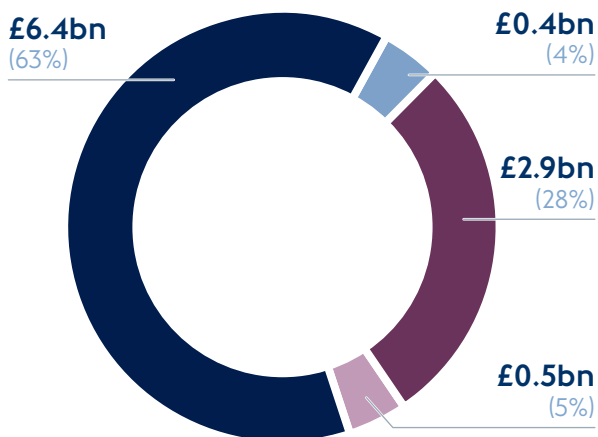
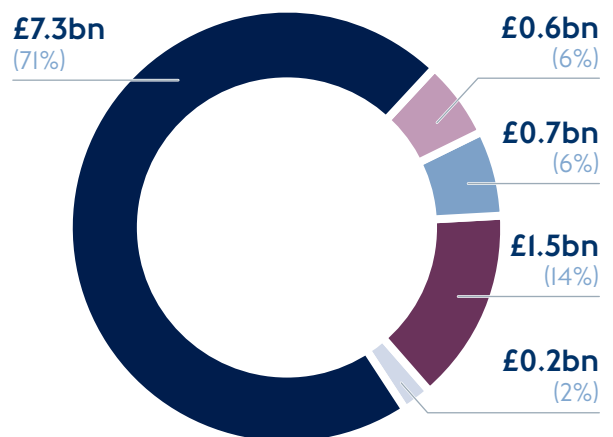


Figure 4: Total costs  
2018/19 – projected



Total: **£10.2bn**

2023/24 – plan



Total: **£10.3bn**

■ Operating costs   ■ Net financing costs   ■ Capital renewals   ■ New capital investment   ■ Increased cash reserves

The 2018/19 new capital investment includes Crossrail capital expenditure

# Key achievements

## Line upgrades

We have already completed the speed improvement and track works for more capacity on the Northern line and started power enhancement works with the award of a design and build contract to Balfour Beatty.

## Deep Tube Upgrade

In November 2018, we signed a £1.5bn contract with Siemens to design and build a new fleet of Piccadilly line trains after the High Court lifted a temporary restriction that had put the procurement on hold.

## Network extensions

The first engineering train on the Northern Line Extension ran on recently installed rails in October 2018, delivering long welded rail for the bulk of the track installation. It entered the Northern Line Extension tunnel delivering 90 metres of rail to the Kennington Green shaft site, which reduced heavy lorry movements.

We also completed platform works at Nine Elms in November 2018, which included installing almost 600 off-site precast units, weighing around six tonnes each.

The first 22kV cable was successfully installed through Oval southbound platform. This represents a major milestone for the Northern Line Extension as we start to energise the power distribution systems. The last engineering train delivering cable ran successfully in the week before Christmas.

In December, we won three awards at the New Civil Engineer Tunnelling awards:

- Best Health, Safety and Wellbeing initiative for our Mental Health Programme
- Young Tunneller of the Year went to Alejandro Vazquez
- Tunnelling Project of the Year (\$100M to \$1bn)

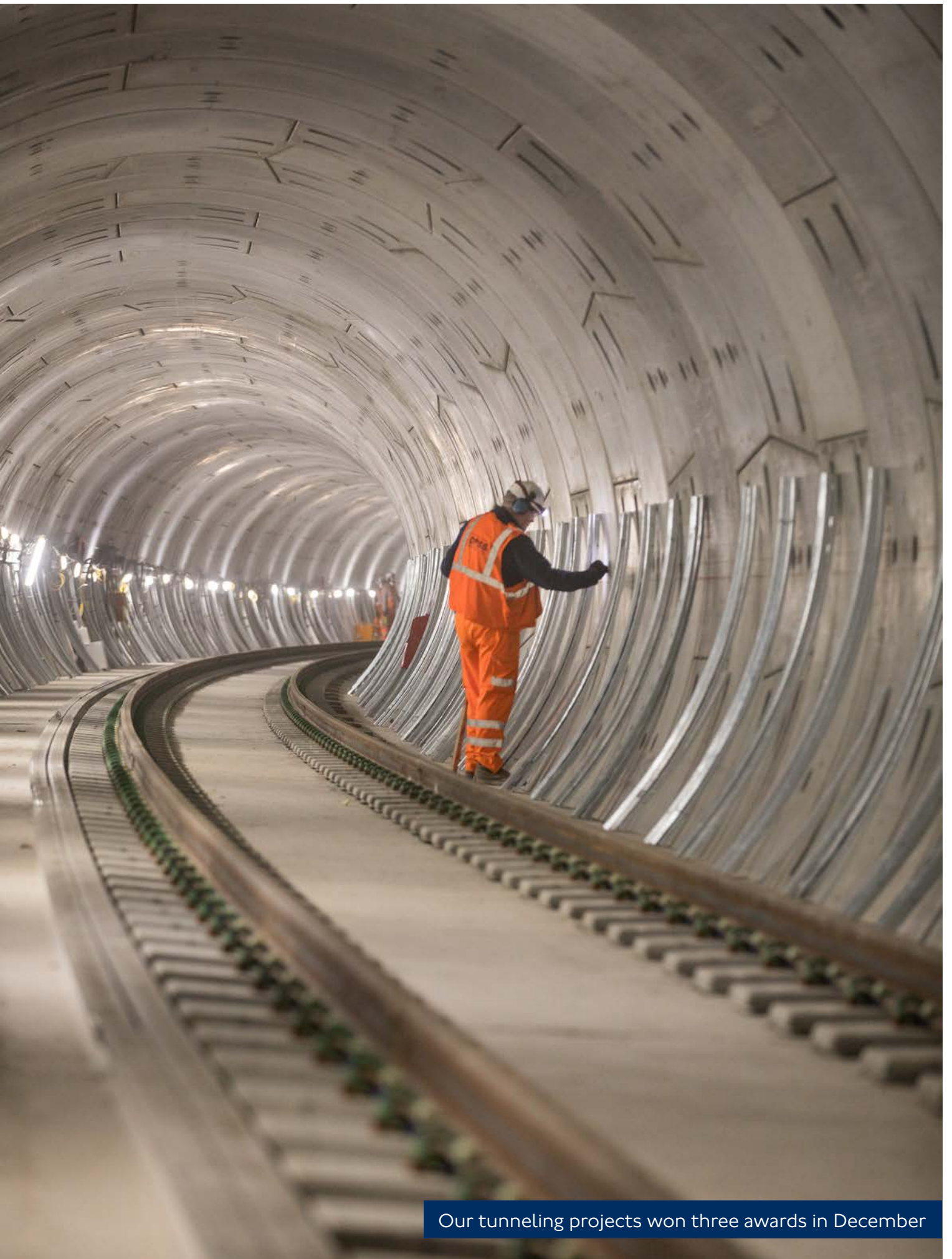
Additionally, our ground-breaking work to raise awareness around mental health received accolades at both the NCE Tunnelling Awards and the TfL Supplier Awards.

Furthermore, we were awarded a Green Apple Champion Award for maximising the transport of materials by river, therefore reducing lorry movements through London. The benefits of this include reducing toxic emissions and road congestion therefore reducing the risk to vulnerable road users.

We completed track installation through the platforms and overrun tunnels at the new Battersea station.

Barking Riverside Extension saw the successful completion of key enabling works on the overhead line equipment sectioning and switching works during a Network Rail Christmas possession. In December, the Main Works Contract was awarded to a joint venture of Morgan Sindall VolkerFitzpatrick.





Our tunneling projects won three awards in December

## **Stations and infrastructure**

Victoria station is now step-free. We achieved a major milestone in the seven-year upgrade project, which includes two new entrances, seven new lifts, nine new escalators, one new ticket hall and the doubling in size of the southern ticket hall. Journeys are step-free between the street and Victoria line trains and the District and Circle line platforms. Victoria is the fourth busiest station on the Underground, serving more than 79 million customers each year. The new lifts will help ensure the station is accessible to all customers.

The new Waterloo & City line entrance at Bank opened on 30 November 2018 and was officially opened on 12 December 2018 by the Mayor Sadiq Khan, Michael R Bloomberg and the Commissioner Mike Brown MVO. This new entrance will help relieve congestion for Waterloo & City line customers. It is the first major milestone in the Bank Station Capacity upgrade programme, which will see the station capacity increase by 40 per cent by 2022.

On 30 November 2018, testing and commissioning works were completed, which enabled the Bakerloo line link to be ready for integration with the Elizabeth line.

This quarter, we have replaced more than 680 metres of ballasted track and more than 600 metres of drainage. We have completed track and drainage works to improve reliability between Baker Street and Finchley Road on the Metropolitan line.

As part of the Mayor's funding for step-free access, we delivered step-free access at Newbury Park in November 2018. We installed two lifts to provide step-free access from street to platform and manual boarding ramps have been provided to give step-free access from the platform to the train. Since the end of the quarter in January, we have also delivered Finsbury Park.

## **London Underground – Power, energy and cooling**

In late 2018, we improved the tunnel ventilation system to reduce temperature increases in the Jubilee line tunnels between Baker Street and Green Park following the introduction of a new timetable.

## **Surface**

As part of the Healthy Streets project, the main construction works at Trinity Square were completed in October. The resurfacing works were completed in early December.

As the Direct Vision Standard and HGV Permit Scheme proposal for London amounts to a technical regulation, we were required to notify the European Commission to ensure it did not conflict with free movement within the European Union. On 6 December, we were notified that the European Commission had no objections to our proposals. Achieving this milestone means we remain on track for issuing permits in October 2019.





The new Waterloo & City line was officially opened on 12 December 2018

As part of the Power Road Green Bridge replacement project, all four carriageway lanes were opened to traffic on schedule in November 2018. The remaining carriageway and footway works are progressing and are scheduled to be completed in February 2019, followed by the removal of the site compound.

There are now more than 2,200 Ultra Low Emission Zone (ULEZ) compliant buses, both single and double-deck, in service. As a result, more than 86 per cent of the bus fleet travelling in the zone is already compliant with the new emission standards.

### **Walking**

We have completed work at 26 of the junctions identified on the safer junctions list and all have had mitigation measures introduced to reduce road danger. We are taking the remaining 47 schemes through design, with 15 of these scheduled for construction by spring 2020.

Work started in November as planned at Old Street roundabout. The project will transform the area. Key features include the removal of the gyratory system, the creation of a large public space, new and improved pedestrian and cycling facilities, as well as new entrances to Old Street Underground station.

### **Cycling**

Reviews have started for the detailed design of a new cycle route on the A40/Western Avenue from Kathleen Avenue to Wood Lane. Subject to relevant approvals, the design is due to be complete by the end of January 2019.

### **Woolwich Ferry**

The three old Woolwich ferries have been replaced with two new, modern, low-emission ferries and have increased capacity, cycle-specific facilities and use a quieter, low-emission engine, all helping to deliver the Mayor's ambition to grow river transport and improve air quality. The Woolwich ferry fully returned to service on 30 January 2019.

The new ferries provide 14 per cent more space than the old vessels and have separate dedicated step-free areas for pedestrians and cyclists, for improved accessibility.

### **Other**

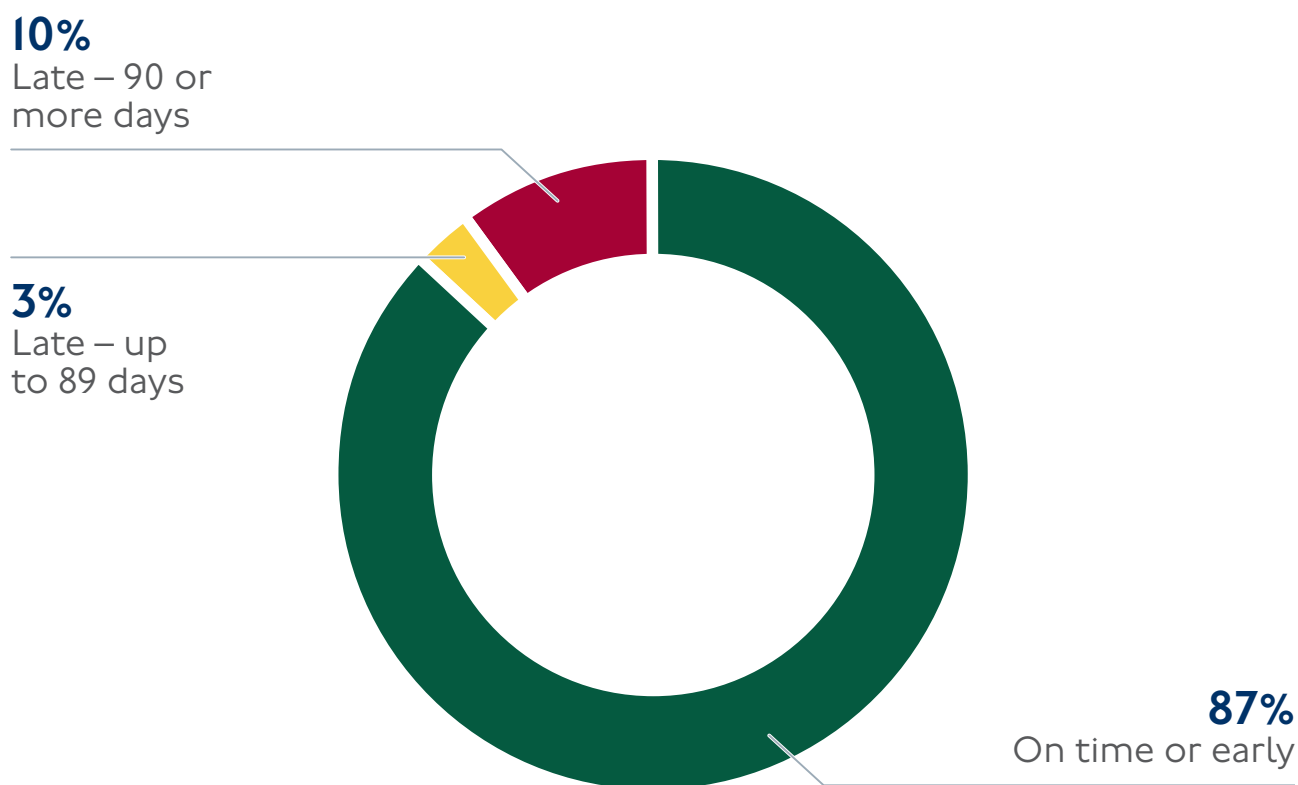
Weekly capping for bus and tram fares was successfully launched on 17 December. An agreement was reached with the train operating companies on 28 November to allow us to now proceed towards a launch of weekly capping on rail modes in spring 2019.

We have installed all buses with new radio equipment and have transferred 90 per cent of the network to the new digital system. We are on target to complete the switchover and core project within this financial year. Staff are already experiencing the benefits of reduced call queuing times on the digital service.



# 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 S-stock trains and signalling system will provide a more reliable service

# Major projects

Line upgrades 

## Four Lines Modernisation

Forecast completion year

**2023**

Spend to date (£m)

**4,548**

Spend authority (£m)

**5,412**

EFC (£m)

**5,243**

EFC movement post plan (£m)

**23**

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.

The EFC remains at £5,243m this quarter, £169m under authority. The £169m savings to date have been achieved by an aggressive schedule aimed at delivering the benefits ahead of the required authority milestone dates, value engineering solutions, innovation, and providing the optimum scope to bring about the planned benefits. Even though good progress has been made on reducing the EFC, the programme is facing some cost challenges that have the potential to affect the current EFC. The Business Plan included a provision of £29m for potential cost increases and work is being undertaken to review the major contracts and risk provisions, which will help determine a clearer view on EFC. The expected range of this could be £10m to £50m in addition to the £29m Business Plan provision. This additional pressure is currently undergoing extensive senior management review and challenge. The approach to driving down costs will continue and be reported in the next quarterly investment programme report.



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We are targeting commissioning of the whole Circle line by the end of 2019 to support an early timetable uplift in March 2020. Commissioning of the final signalling area between Rayners Lane and Uxbridge remains on schedule to support the final timetable uplift in May 2023.

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.

### **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.





We have been testing our new train control system



## Capacity Optimisation – World Class Capacity

Forecast completion year

**2024**

Spend to date (£m)

**105**

Spend authority (£m)

**245**

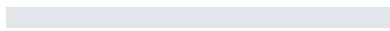
EFC (£m)

**209**

EFC movement post plan (£m)

**2**

2018/19 budget milestone RAG



**This is a programme which includes upgrades to signalling, power, trains, track and data with the target of increasing capacity on the Jubilee and Northern lines without the need to procure new trains. While a lot of the works are standalone, a significant proportion is essential to other programmes, including further upgrades to the Jubilee line and Victoria line.**

The World Class Capacity programme is directly responsible for signalling works for the Northern Line Extension and Bank capacity upgrade.

To enable the new capacity works, we have already completed speed improvement and track works to the Northern line and started power enhancement works with the award of a design and build contract to Balfour Beatty.

Enhancements to the Jubilee line continue to be developed, which includes improving the speed that trains exit the depot onto the mainline at Neasden, which is an essential service enabler for the Four Lines Modernisation. Train crew accommodation enhancement works at North Greenwich have also been completed.

The EFC has increased by £2m compared to the 2018 Business Plan, driven by works at Neasdon Depot, which are required to enable the Jubilee line capacity improvement programme. This will increase the capacity to 32 trains per hour on the central section in the peak by the end of 2021.

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## Assurance

Project Assurance 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 to the Committee on 11 December 2018 on the six recommendations that were made and accepted, including three by the IIPAG. All recommendations are now closed.





## Capacity Optimisation – DLR Rolling Stock and System Integration

Forecast completion year

**2025**

Spend to date (£m)

**11**

Spend authority (£m)

**\***

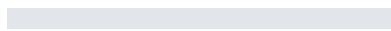
EFC (£m)

**\***

EFC movement post plan (£m)

**\***

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 no accidents or injuries.

The programme will replace 60 per cent rolling stock that is nearing the end of its design 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 technical evaluation done in September 2018. The depot concept design has been accepted and a detailed design contract let for the enabling works and sidings design. Topographical and drainage surveys are complete and geotechnical surveys are under way on site.

Since the end of Quarter 3, on 11 December 2018, the Programmes and Investment Committee granted authority to procure 43 DLR trains to increase capacity and to replace approximately 60 per cent of the existing fleet (33 trains) and for the associated enabling works.

\* This information is withheld until final contract is awarded

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Workshops with Keolis Amey Docklands to plan how the operational service will be maintained during the depot enhancement works has begun and detailed operational modelling for the early stages completed. Negotiations with UK Power Networks to secure additional power supplies have started 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.

### **Assurance**

Project Assurance completed an integrated assurance review on the DLR Rolling Stock Replacement programme submission to the Programmes and Investment Committee meeting on 11 December 2018. Five recommendations were made and accepted, including three by the 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.



We are reviewing the scope of our Deep Tube Upgrade programme



# Deep Tube Upgrade programme



## Deep Tube Upgrade programme

Forecast completion year

**2030/31**

Spend to date (£m)

**98**

Spend authority (£m)

**3,294**

EFC (£m)

**3,105**

EFC movement post plan (£m)

**4**

2018/19 budget milestone RAG



**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. The initial focus is on the upgrade of the Piccadilly line.**

The Business Plan, published on 12 December 2018, discontinued the current procurement of signalling and the bidders were informed of this on 12 December 2018.

We remain committed to delivering new signalling on the Piccadilly line, as well as the other Deep Tube lines, once long-term capital funding is secured.

Following the signing of the rolling stock contract in Quarter 2, we held a series of meetings with Siemens leading to the development and agreement of its 100 day plan. This plan focuses on contract and team mobilisation, and the development of the draft Piccadilly line rolling stock concept design.

We have advised applicants of the outcome of the one person operation CCTV selection process. Our efforts are now focused on finalising the Invitation to Tender and contract documents ahead of issuing in Quarter 4.

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. During Quarter 3, a contract was signed with Siemens Mobility Limited to design and build 94 Tube trains to replace the existing 1970s fleet. This has resulted in a £4m reduction in EFC since the 2018 Business Plan. The EFC has reduced by £120m since last quarter, driven by the removal of works on lines other than the Piccadilly line following the business plan finalisation, as well as efficiencies related to Piccadilly line works such as savings on signalling, power and cooling, and resources.

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## 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 December 2018 on the 10 recommendations that were made and accepted, including five by the 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.

# Network extensions



## Northern Line Extension

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
**	682	*	*	*

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 supports the regeneration of the Vauxhall Nine Elms Battersea Opportunity Area.**

We completed the platforms at Nine Elms station in November 2018, including installing almost 600 off-site precast units, weighing around six tonnes each. The casting of the lining wall and column encasement continues. Blockwork installation, to create the internal walls and rooms continues. Enabling works to support the escalators are complete. Now that the gantry crane has been dismantled and removed from site, construction of the eastern superstructure columns has begun. Cable management system modules were delivered to the site in early December 2018 and are now being installed.

At Battersea, we have installed the track through the platforms and overrun tunnels at the station. The civils works were completed with the pouring of the western core concrete

roof slabs. Blockwork has started on the internal walls to form the rooms in the new station and we have installed the architectural ceiling in the station ticket hall, apart from the last four sections. These will be installed when the tower cranes are decommissioned and removed from site. The final transfer beam, to support the future over-station development, was installed in the crossover box in December 2018. Construction of the Prospect Way access road has begun.

At Kennington Green, work continues to join the shaft to the basement. The cable management system installation between Kennington Park shaft and Nine Elms station was completed in October 2018. Excavation at Kennington Park was also finished in October 2018.

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

\*\* The end of December 2020 target opening date is currently under review. This is driven by the need to adapt the construction programme as the designs for Battersea Power Station's over-station development and Tube station have evolved.





The Northern Line Extension and GPS Marine were awarded a Green Apple Champion Award for environmental best practice

The first engineering train on the Northern Line Extension ran in October 2018, delivering long welded rail. It entered the Northern Line Extension tunnel over the northbound step-plate junction points, delivering rail to the Kennington Green shaft site. This paves the way to deliver materials and equipment for other NLE systems over the next 18 months.

All long welded rail deliveries are now complete as is rail installation in the northbound tunnel. Rail installation in the southbound tunnel continues.

The first 22kV cable was installed through Oval southbound platform. This represents a major milestone for the Northern Line Extension as we start to energise the power distribution systems. The last of the engineering trains delivering cable ran in the week before Christmas.

In December, we won three awards at the New Civil Engineer Tunnelling awards:

- Best Health, Safety and Wellbeing initiative for our Mental Health Programme
- Young Tunneller of the Year went to Alejandro Vazquez
- Tunnelling Project of the Year (\$100M to \$1bn)

Additionally, the ground-breaking work we are doing to raise awareness around mental health received accolades at both the NCE Tunnelling Awards and the TfL Supplier Awards.

The Northern Line Extension and GPS Marine were awarded a Green Apple Champion Award, which recognises environmental best practice, for efforts in maximising the transport of materials by river, thereby minimising lorry movements through central London. The benefits include reducing emissions of toxic pollutants and substantial carbon savings compared to heavy goods vehicles (HGVs). It also reduces congestion and the risks to vulnerable road users. This is the second Green Apple Award for the project, having won in 2015 for our advanced environmental monitoring system.

### Assurance

Project Assurance completed an integrated assurance review on the Northern Line Extension programme submission to the Programmes and Investment Committee meeting on 11 December 2018. Ten recommendations were made and accepted, including six by the 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.



## Silvertown Tunnel

Forecast completion year

**2024**

Spend to date (£m)

**49**

Spend authority (£m)

**\***

EFC (£m)

**\***

EFC movement post plan (£m)

**\***

2018/19 budget milestone RAG



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

Bidders will submit their final technical and financial proposals in early 2019, and we will award the contract in the summer. We have been concluding the negotiation stage and held clarification meetings responding to queries. The first stage technical submission has also been evaluated by our engineering specialists.

We have started a number of pre-construction activities to facilitate a smooth start to construction once the contract is awarded. This includes the design for enabling works packages and we completed concept designs for the replacement North Greenwich car parks in September. In October, we started baseline monitoring of existing assets in the area to ensure at least a 12-month monitoring period before the main tunnel construction works commence. We are also working with utilities companies to deliver design and progress early investigation and service diversions.

The tunnel will connect Silvertown and the Greenwich Peninsula, which are areas being developed by third parties

with numerous tenants and landowners. We have been establishing third party agreements with each of them and negotiating land access. We have also been developing our consent obligations and borough agreements to ensure benefits of the tunnel are maximised and the area around the tunnel is enhanced.

### 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 December 2018 on the 10 recommendations that were made and accepted, including six by the IIPAG. Six 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.

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





## Barking Riverside Extension

Forecast completion year

**2021**

Spend to date (£m)

**23**

Spend authority (£m)

**\***

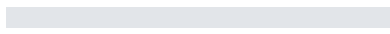
EFC (£m)

**\***

EFC movement post plan (£m)

**\***

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 extend our service 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 for the site were completed in May 2018 and the overhead line equipment sectioning and switching works has been procured over Christmas 2018. These works will further enable the possession of Network Rail infrastructure by the Main Works Contractor, planned in 2019, to take place.

Tender returns for the Main Works Contract were received in July 2018 and, after a value engineering exercise and best and final offer stage, the contract was awarded in December 2018 to a joint venture of Morgan Sindall VolkerFitzpatrick.

### Assurance

Project Assurance completed an integrated assurance review on the Barking Riverside Extension programme submission to the Programmes and Investment Committee meeting on 11 December 2018. Seven recommendations were made and accepted, none by the 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.

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



The developments at Victoria station will help relieve congestion for customers

# Major stations

## Victoria station upgrade and finishes

Forecast completion year

**2019**

Spend to date (£m)

**572**

Spend authority (£m)

**612**

EFC (£m)

**582**

EFC movement post plan (£m)

**1**

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.**

Three new escalators leading down from the south ticket hall were brought 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 refurbish the Duke of York pub, which was closed to enable jet grouting works for the tunnels. Stairwell construction, internal plastering and mechanical and electrical works are now well under way with remedial works now commencing on the shop front.

The new station was opened in stages. Within this quarter, all passenger facing 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.

The EFC has increased by £1m since the last quarter to £1m over the 2018 Business Plan as the project nears completion. Authority has decreased by £48m following reallocation to the Bank station capacity upgrade project.



## Bank Walbrook

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 have built 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 new Bloomberg entrance onto Walbrook opened to customers on 30 November, and had its formal opening on 12 December 2018. The focus is now on a successful handover of the newly installed assets to our maintenance and operational teams as well as to formally close the project.

The EFC has remained static since last quarter and is aligned to the 2018 Business Plan.





## Bank station upgrade

Forecast completion year

**2022**

Spend to date (£m)

**400**

Spend authority (£m)

**656**

EFC (£m)

**656**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



**We are boosting capacity at Bank station by 40 per cent. This includes creating a new Northern line tunnel, platform and circulation spaces, a new entrance on Cannon Street and within the ground floor of Bloomberg's European headquarters, the introduction of step-free access to the Waterloo & City line and Northern line, and additional DLR platforms, and a moving walkway between the Central and Northern lines to reduce customer journey times.**

Tunnelling works are progressing well at Bank, with most of the tunneling nearly complete and the waterproofing of the new tunnels continues ahead of schedule. The secondary lining has now started, along the new Central line moving walkway tunnel. The remaining tunnelling works are on schedule.

At the Whole Block site we have completed pouring the final base slab concrete for the new station entrance box. Tunnelling works from the new station box for the new lift shaft has started. This will deliver step-free access to the Northern line in 2022. Enabling works at the Northern line platform are complete and will ensure an efficient connection between the existing and the new parts of the station.

The EFC has remained static since last quarter and is aligned to the 2018 Business Plan. Authority has increased by £48m and is now aligned to EFC, following a reallocation from the Victoria station upgrade project. The project is committed to identifying further opportunities and has a collaborative approach with the main contractor to identify opportunities and realise potential savings.



## Bakerloo line link

Forecast completion year

**2018**

Spend to date (£m)

**66**

Spend authority (£m)

**69**

EFC (£m)

**69**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



The EFC has remained static since last quarter and is aligned to the 2018 Business Plan.

### **A new step-free pedestrian walkway at Paddington is being constructed to link the Bakerloo line platforms with the new Elizabeth line station.**

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



## Holborn station capacity

Forecast completion year

**2031**

Spend to date (£m)

**5**

Spend authority (£m)

**5**

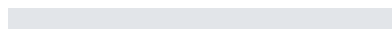
EFC (£m)

**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 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 reduce crowding during peak periods.**

Our 2018 Business Plan confirmed our intention to progress the Holborn capacity upgrade, which will be crucial to supporting our upgrade of the Piccadilly line. We will shortly start a process to drive innovation and savings on the current proposed design for the station, which will take approximately 12 months.

The EFC represents early stage works, including concept design and Transport and Works Act Order preparation and is aligned with the current spend authority. Work continues beyond this stage forming part of a wider EFC. The EFC has remained static since last quarter and is aligned to the 2018 Business Plan.



## Camden Town station capacity upgrade

Forecast completion year

**TBC**

Spend to date (£m)

**10**

Spend authority (£m)

**24**

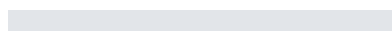
EFC (£m)

**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.**

As our 2018 Business Plan explains, we are reliant on steady and sustained investment from the Government to support major capital investment. We currently have no certainty of capital funding beyond 2020, and over the next year we will be making the case to Government for confirmed capital support to enable critical infrastructure projects, such as Camden Town.

In the meantime we continue to look to identify third party funding and work with potential development partners, which could help fund the new station entrance and capacity improvements.

### 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 December 2018 on the 15 recommendations that were made and accepted, including nine by the IIPAG. All recommendations are now closed.

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. The EFC has remained static since last quarter and is aligned to the 2018 Business Plan.



## 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.**

Following the submission of the Independent Affordability Review's Draft Interim Report to the Mayor and Secretary of State for Transport in the summer, we have been working with the Department for Transport and Network Rail to address some of the recommendations put forward by the panel. A meeting was held with the Independent Affordability Review Chair to brief him on our progress.

Despite the delays to the opening of the Elizabeth line, we remain committed to Crossrail 2. We continue to develop and refine the scheme as we prepare to provide the Government with an update to our business case in anticipation of the next phase of work. We are also supporting the Greater London Authority (GLA) in its work with Homes England and the Department for Communities and Local Government to deliver 200,000 homes across London and the South East.

The Bakerloo Line Extension from Elephant & Castle to Lewisham will increase capacity and improve 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. We also intend to commence market engagement for construction and financing.





Station improvements at Liverpool Street station have improved capacity and safety for customers at this busy interchange



# London Underground

Stations 

Forecast completion year

**2023/24**

Spend to date (£m)

**1,995**

Spend authority (£m)

**3,207\***

EFC (£m)

**2,533▲**

EFC movement post plan (£m)

**0**

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 three that will interchange with the Elizabeth line. We completed improvements at Liverpool Street, Paddington and Moorgate stations at the end of 2018.

## Station enhancements

At Finsbury Park, a new passageway linking the existing station to the future western station entrance is almost complete. Testing and commissioning of the new lifts was completed and the station became step-free at the end of January.

We have completed the concept design for the South Kensington station capacity upgrade project and continue work to appoint a design and build contractor by March 2019 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 have started enabling and civils works on the lift shaft to the platform.

The EFC, which covers all projects including those completed within the stations programme, has increased from £2,440m at Quarter 2 as it now includes the financial year 2023/24.

\* The authority has increased by £66m since Quarter 2 mainly because of the introduction of the Asset Resilience programme.

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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 have also been completed. Works above ground level will follow pending a resolution with the train operating company and Network Rail regarding revenue protection issues.

In early December we held a public consultation exhibition on the Colindale station redevelopment at the RAF Museum and concept design has now started. The project will bring significant improvements, including a spacious new entrance, a new lift providing step-free access to the platforms and new homes around the station.

#### **Developer funded works**

We are working with Berkeley Homes to create a new entrance at West Ham station with step-free access between the entrance and Berkeley's development site. We have drafted the concept design specification documents and are working with the developer to produce a legal agreement.

We are working with Canary Wharf Group to deliver a new station entrance and three new escalators at Waterloo. Communications and public announcement systems installations are almost complete and we plan to open the new entrance in spring 2019.

We are creating 11 retail units in the railway arches beneath Wood Lane station. Shop front and service installation works are under way.

#### **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 GLA and the Secretary of State. We have reached a Section 106 agreement with the developer and the London Borough of Southwark and we are awaiting final approval. As part of the development, a new station box with connecting tunnels to the existing platforms will be built to increase capacity at the station and provide step-free access to the Northern line.

At Paddington, we are working with Great Western Developments to construct a new entrance to the Bakerloo line, with an enlarged ticket hall and step-free access to the platforms, as part of its redevelopment of adjacent buildings. Demolition works at street level are now complete and we continue to collaborate with Great Western Developments and its consultants to confirm the scope, agree commercial terms and finalise a Works Agreement before starting the concept design phase.



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At Stratford, we continue to work with stakeholders to consider access and capacity improvements. This includes working with the London Legacy Development Corporation on reviving proposals for a new entrance to serve the Carpenters Road area, along with improvements to step-free access and capacity in the adjacent subway.

### **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 December 2018 on the eight recommendations that were made and accepted, including three by the 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 process.

# Accessibility



Forecast completion year

**2023/24**

Spend to date (£m)

**35**

Spend authority (£m)

**244**

EFC (£m)

**165**▼▼

EFC movement post plan (£m)

**25**

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 34 per cent of stations accessible by 2020 by providing step-free access at a further 15 stations.**

We have announced the 15 stations that will be step-free by March 2020. As part of the Mayor's funding for step-free access, we delivered step-free access at Newbury Park in November 2018. We installed two lifts to provide step-free access from street to platform and manual boarding ramps have been provided to give step-free access from platform to train. As part of the fire strategy, platform places of relative safety and additional fire escapes have been provided. Additionally, an accessible toilet is being constructed.

We are working to provide step-free access at a number of other locations, including Harrow-on-the-Hill.

We awarded a design and build contract for seven further stations on 7 December 2018, and design work has started. The stations are Burnt Oak, Debden, Hanger Lane, Ickenham, Northolt, Sudbury Hill and Wimbledon Park. Award of this contract was a key milestone and we are on schedule to deliver step-free access at these stations by 2020.

We are also working on designs for additional step-free stations to be delivered in the mid-2020s.

The EFC has decreased from £197m at Quarter 2 as Lot 3 stations and unannounced Lot 2 stations are not funded in the 2018 Business Plan.

# Track renewals

Forecast completion year

**Annual**

Spend to date (£m)

**74**

Spend authority (£m)

**107**

EFC (£m)

**106**

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



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

This quarter, we have replaced more than 680 metres of ballasted track and more than 600 metres of drainage. On our deep Tube track network, we replaced 1.75km of an older track type with modern flat bottom rails and renewed a further 850 metres of concreted deep Tube track.

We have completed planned works to improve reliability between Baker Street and Finchley Road on the Metropolitan line. In total this year, the project has replaced 1.1km of track and improved drainage in this area.

Procurement of our 2019/20 track delivery partner is on schedule and we expect to award the contract in spring 2019.

## 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 December 2018 on the seven recommendations that were made and accepted. 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 process.

# Power, cooling and energy



Forecast completion year

**2023/24\***

Spend to date (£m)

**39**

Spend authority (£m)

**90**

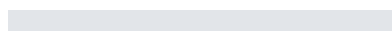
EFC (£m)

**133**▼▼

EFC movement post plan (£m)

**0**

2018/19 budget milestone RAG



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

The EFC has decreased from £197m at Quarter 2 due to the reduction in funding in the 2018 Business Plan

## Power

We are supporting a number of third party and major projects by providing power works, such as relocating the substation at Euston for High Speed 2, installing cable routes for the Northern Line Extension and providing a programme of works for the Deep Tube Upgrade.

We are delivering power renewal works to ensure our power assets are safe and compliant and enable a reliable service to our customers. This is being delivered through a work bank of projects that will run until at least 2021.

We have agreed the procurement strategy to extend the life and address immediate obsolescence risk on the three power control systems across the Underground network by consolidating them into a single system. The systems remotely monitor and safely operate traction, station, signalling and depot power supplies.

\* The figures represent power and energy projects until 2023/24.



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## Cooling

We improved the tunnel ventilation system in late 2018 to reduce temperature increases in the Jubilee line tunnels between Baker Street and Green Park following the introduction of a new timetable.

Works continue at Bond Street station to provide improved airflow to the new Elizabeth line tunnel.

Following the commissioning of the City Road ventilation and heat recovery scheme last quarter, the remaining works, which will deliver low carbon heat from the Northern line to local homes and businesses, are expected to be delivered by the London Borough of Islington in early 2019.

## Energy

We are progressing the project to install solar panels on the roof of the Acton workshop as part of the Mayor's drive to be a zero-carbon city by 2050. In 2019, we will assess the feasibility of installing solar panels at further sites. The 700kWp system will generate more energy than is consumed on site, with the excess feeding our other buildings and assets.

## Assurance

Project Assurance completed an integrated assurance review on the Power, Cooling and Energy programme submission to the Programmes and Investment Committee meeting in July 2018. A quarterly update was provided to the Committee on 11 December 2018 on the 13 recommendations that were made and accepted, including eight by the IIPAG. Eight 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 process.

# Rolling stock renewals



Forecast completion year

**2029**

Spend to date (£m)

**204**

Spend authority (£m)

**612\***

EFC (£m)

**1,012**▲

EFC movement post plan (£m)

**0**

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 making 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 30 out of 36 trains and expect to complete the remaining trains by mid-2019.

On the Jubilee line, 37 refurbished trains out of 63 trains are back in service. The refurbishments include a wheelchair area, replaced flooring, refreshed interior, which includes grab-poles and handles, and sealing to the roof and windows.

On the Central line improvement programme, the new AC traction package contract, which will provide a more reliable power supply to the fleet, continues as planned. We moved a carriage to the Bombardier test site to start prototyping for the new traction. We have awarded the LED lighting contract and are at preferred bidder stage on new flooring.

We continue the design for 71 new engineering vehicles to support track renewal and maintenance activities.

The EFC increase from £1,006m at Quarter 2 mainly relates to the introduction of a project to enhance train operator security part of which will install safety glass casing over the cab door handle where it is not already installed across our existing fleets.

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



We have refurbished 37 trains on the Jubilee line and they are now back in service

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We are designing and building a track renewal vehicle to reduce the cost of deep Tube track renewal and maintenance by mechanising the renewal process. The engineering vehicles required for the prototype are currently being overhauled. Areas within Ruislip Depot are being investigated to ensure the necessary capability and space is available to support the future operation of the engineering vehicles.

A contract has been placed to overhaul the engineering vehicles that provide our Kirow cranes with secure boom retention points to carry out track renewal works.

We are evaluating the options for replacing our track recording vehicle, which records and monitors the alignment and condition of the track.

### **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 December 2018 on the eight recommendations that were made and accepted. Six recommendations are closed and good progress is being made to close the remaining two. Project Assurance tracks progress against the recommendations made, as part of its continuous assurance process.



# Signalling and control



Forecast completion year

**2023/24**

Spend to date (£m)

**66**

Spend authority (£m)

**143\***

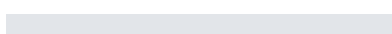
EFC (£m)

**188**▲

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 by major upgrades. This ensures that they can continue to support a safe, reliable and maintainable service until then.**

Siemens Mobility has started the design for the life extension of the Central line signalling and control systems. Once the design has been finalised we will run a pilot to test the solution. This project will maintain the reliability, availability, maintainability and safety of the assets to resolve obsolescence concerns.

We have started commissioning the new Piccadilly line signalling control system at the control centre in west London. We continue to complete snagging works in the building and the next commissioning, which will migrate control between Acton Town and South Harrow, will follow in spring 2019. The programme is progressing well and all remaining migrations are due by the end of 2019.

Work continues to award the contract in early 2019 for re-signalling the Northumberland Park Depot.

The EFC increase from £181m at Quarter 2 reflects an increase in costs on life extension works on multiple Tube lines, plus maturing cost estimates for the Northumberland Park signalling modernisation programme.

\* Additional authority of £74m was granted by the Programmes and Investment Committee on 3 July 2018, taking the total to £143m for works to 2023/24. Further authority will be sought in future.

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## 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 December 2018 on the nine recommendations that were made and accepted, including six by the IIPAG. Five recommendations are closed and good progress is being made to close the remaining four. Project Assurance tracks progress against the recommendations made as part of its continuous assurance process.



We have started commissioning the new Piccadilly line signalling control system at the control centre in west London





We are encouraging more people to cycle by making it a safer option



# Surface

## Healthy Streets

Forecast completion year

**2021/22**

Spend to date (£m)

**359**

Spend authority (£m)

**957**

EFC (£m)

**1,759**

EFC movement post plan (£m)

**\***

2018/19 budget milestone RAG 

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

### Highbury Corner

Construction is progressing well for the major reconfiguration of the road network and removal of the gyratory at Highbury Corner, with highway works due to be completed by summer 2019.

The latest phase of construction has focused on completing gas works on Canonbury Road, where we have saved time by working closely with Cadent Gas. The project has also secured significant savings through value engineering activities, with £800,000 returned to the business so far.

### Wandsworth Gyratory

The purchase of properties from landowners on Putney Bridge Road is in progress and targeted for completion in June 2019. The scheme layout in Armoury Way is being reviewed in light of the focus to reduce costs by ensuring all land take is essential. Initial traffic modelling outputs indicate minimal traffic impact as a result of the changes, ahead of securing endorsement from Wandsworth and us to adopt the revised layout. We plan to start work on site in 2021.

The EFC reflects the latest Business Plan up to 2021/22 to provide a direct comparison to the original authority requested. Spend authority is to the end of 2019/20.

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## Fiveways

The concept design has been completed and is being reviewed for final Technical Approval and subsequent audit. Following this, we expect to issue a tender to invite bids for the detailed design and construction contract in July 2019.

Croydon, the Local Planning Authority, has confirmed that no Environmental Impact Assessment is required. We are now compiling a planning application, which is expected to be submitted in October 2019. Planning approval is required before we proceed with the necessary compulsory purchase order for essential land. The compulsory purchase order process is expected to start in June 2020, following TfL Board approval.

## Vauxhall Cross

We are transforming Vauxhall gyratory to make it safer for cyclists and pedestrians, improve the bus station, and accommodate the increased level of passengers as a result of the Vauxhall, Nine Elms, Battersea development.

The proposals are subject to a number of complex consents. The revised plans for the Vauxhall Cross Island site, located in the middle of the gyratory, were approved by Lambeth Council Planning Committee in December and will now be referred to the Mayor, with a decision expected in early 2019. This planning permission is the last external consent required and, subject to a review by the Secretary of State for Transport, we

will progress with a mini-competition through our civils project framework to appoint a design and build contractor in winter 2019, for start on site in the latter part of 2021.

## Trinity Square (City of London)

The main construction works at Trinity Square were completed in October. The resurfacing works were completed in early December, with the anti-skid treatment planned for January. Following agreement with the Historic Royal Palaces, the highway boundary markers are being fabricated and will be installed by the end of January 2019.

## Waterloo City Hub

The scheme provides a significant upgrade for the safety and comfort of pedestrians, cyclists and public transport users, with pedestrian crossings, segregated cycling facilities and improved bus waiting and boarding. It also provides a better urban realm connecting the Southbank area and public transport services.

The proposed transformational scheme at this busy junction is progressing well and the initial concept design has been prepared. This early design will aid engagement with key stakeholders and the public. We are now working with our supply chain to review the buildability, risks and opportunities in our current proposals. We hope to start construction in spring 2020, subject to securing the necessary consents. In December, we obtained a decision

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from Lambeth Council confirming that an Environmental Impact Assessment for the scheme was not required. Pre-application meetings and dialogue with the council will continue over the coming months, ahead of a planning application submission in spring 2019.

### **Old Street Roundabout**

The initial stages of construction commenced in November as planned at Old Street roundabout, with the main works due to follow in May. As well as improving safety at this critical and busy junction, the project will transform the area. Key features include removing the gyratory, creating a large public space, new and improved pedestrian and cycling facilities, and new entrances to Old Street Underground station.

### **Direct Vision Standards**

We plan to improve safety for vulnerable road users by setting higher standards for heavy goods vehicles (HGVs) coming into London with our Direct Vision Standard. This standard will use a zero- to five-star rating system to define how much an HGV driver can see directly from each vehicle's cab, rather than through mirrors or other equipment. It will give regulators, manufacturers, operators and contractors an objective standard by which to rate and improve the safety of HGVs.

As the Direct Vision Standard and HGV Permit Scheme proposal for London amounts to a technical regulation, we were required to notify the European

Commission to ensure that it did not conflict with 'free movement' within the European Union. On 6 December, we were notified that the European Commission had no objections to our proposals. Achieving this milestone means we remain on track for issuing permits in October 2019.

Although we have consulted on these proposals in the past, as the scheme has developed, we want to share more detail on how it works in practice. As such, an additional consultation is open on our website until 18 February 2019.

### **Surface Intelligent Transport System**

We are leading the way in terms of delivering an innovative new road traffic management system that makes journeys on foot, bike, bus, as well as essential emergency services and freight trips, as efficient as possible. We are in the design phase and on target to deliver the first set of improvements in late 2020.

### **Cycleways**

The detailed design for the detailed design for a new cycle route on the A40/Western Avenue from Kathleen Avenue to Wood Lane is progressing well. Internal and external reviews have been done and, subject to relevant approvals, the design is due to be complete by the end of January 2019. Following initial strategic modelling results received in the summer, further design and modelling has been carried out on the inner section of the route between Wood

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Lane and Notting Hill. This work is due to be complete by the end of January 2019 ahead of public consultation in spring.

Following a court hearing on 6 September, a ruling was passed down on 13 September and an order granted preventing us from starting construction works at Swiss Cottage for a new cycle route between Swiss Cottage and the West End. An application for permission to appeal to the Court of Appeal was filed on 11 October and we are awaiting the Court's decision.

### **Bus Stop Bypasses**

We are progressing with work to retrofit zebra crossings to Bus Stop Bypasses following engagement with interested stakeholders and an on-street trial. During the trial, visually-impaired users found the addition of a zebra crossing at Bus Stop Bypass crossing points made their experience more comfortable and enabled them to find the crossing point more easily. We took the decision to update our guidance on bus stop bypasses to include a zebra crossing, and committed to retro-fit zebra crossings at all existing bus stop bypasses. We have completed 60 per cent of the sites identified and the completed crossings are now in use. The remaining sites are planned to be completed by the end of March 2019.

We continue to make good progress on our work with London boroughs to create new cycle routes across the capital, with a focus on completing and opening whole or significant sections of new routes.

We have constructed 112km and have a further seven kilometres of the proposed 250km network of cycle routes through inner and outer London under construction.

Almost 100 cycle infrastructure schemes and five behaviour change schemes across three outer London boroughs – Waltham Forest, Enfield and Kingston are under way. Thirty-two of the 103 Mini-Holland schemes are now complete, including the A105 Green Lanes scheme, a five-kilometre protected cycle route linking Enfield Town to Palmers Green. Initial post implementation monitoring of the A105 Green Lanes scheme has shown a 52 per cent rise in cycling along this route compared to surveys from 2016. Further schemes under construction include segregated cycle routes on Wheatfield Way in Kingston, the A1010 in Enfield, and Lea Bridge Road in Waltham Forest. Further schemes are going through design and consultation, and will complement other cycling and healthy streets schemes in and around these boroughs.





We continue to work with London's boroughs to develop our network of cycle routes

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### **Rotherhithe to Canary Wharf Crossing**

This project will provide a much needed new walking and cycling crossing between the two key Opportunity Areas of the Isle of Dogs/South Poplar and Canada Water. This will provide a safe, attractive and direct route for pedestrians and cyclists, relieving existing transport links and encouraging more active travel.

We continue to develop plans for our provisional preferred option of a navigable bridge. We have been discussing a number of key aspects of the crossing with stakeholders, including preferred height, alignment and landing arrangements. We have also been developing further details around how the bridge will be operated, maintained and constructed. This will lead to a full public consultation on our detailed proposals in 2019, which will help inform preparation of an application under the Transport and Works Act 1992, also planned for 2019.

### **Safer Junctions**

In April 2017, the Safer Junctions list highlighted the 73 most dangerous junctions on our road network, defined as those with the highest vulnerable road user collision rates between 2013 and 2015. We have now completed work at 26 of these junctions and all have had mitigation measures introduced to reduce road danger. We are currently reviewing the completed projects to ensure they have successfully reduced collisions. We are taking the remaining 47 schemes through design, with 15 scheduled for construction by spring 2020.

### **Crossrail complementary measures**

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

So far Crossrail complementary measures works are complete at five stations (Romford, Chadwell Heath, Goodmayes, Abbey Wood and Manor Park). Site works at eight stations (Ilford, Harold Wood, Gidea Park, Seven Kings, Forest Gate, Maryland, Hanwell and West Drayton) are at various stages of development. Four stations, (Southall, Ealing Broadway, Acton Main line and West Ealing) are at design or consultation stage.





We have completed work at 26 areas as part of our Safer Junctions programme

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Works to some of the west London stations will be completed later than December 2019 due to challenges in aligning Crossrail station works, which has slipped significantly, with the Crossrail complementary measures.

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

Construction of schemes at Baker Street, Stratford Gyratory, Tottenham Court Road (West End project), White Hart Lane, Beddington, Hayes town centre and Feltham are currently under way in accordance with the agreed programmes and budget allocations.

The works at Bond Street, Beckenham town centre and West Norwood are now complete. Construction is due to start at Hornsey Lane Bridge and the Blackhorse Road junction with Forest Road in spring this year.

Boroughs have submitted their draft Local Implementation Plans to us, and feedback was sent to them before Christmas. The final documents will be submitted to us in February. They will be further assessed before being passed to the Mayor for his consideration and approval in March.

### **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 December 2018 on the nine recommendations that were made and accepted, including four by the IIPAG. Seven 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.



# Air quality and environment



Forecast completion year

**2022/23**

Spend to date (£m)

**91**

Spend authority (£m)

**280**

EFC (£m)

**433**

EFC movement post plan (£m)

**-28**

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.**

## Ultra Low Emission Zone update

From April 2019, the central London Ultra Low Emission Zone (ULEZ) will replace the T-Charge and operate in the same area, alongside the Congestion Charge. Unlike the T-Charge and Congestion Charge, which are only in place on weekdays, the ULEZ 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.

The core elements of development on our website are complete. We continue our testing to ensure the systems integrate correctly, with regression and performance testing in progress. We have also started installing the road signs at the boundary of the zone. We continue to act to maximise vehicle compliance, to the required standards, by ramping up our comprehensive communications and stakeholder engagement strategy and a targeted letter drop campaign and messaging on our variable message signs.

## Fleet compliance

There are now more than 2,200 ULEZ compliant buses, both single and double deck, in service. As a result, more than 86 per cent of the bus fleet

The EFC reflects the latest high-level estimate for implementation costs of the Ultra Low Emission Zone expansion in 2021 and Low Emission Zone tightening in 2020. This was not reflected in the Business Plan as we are still developing the delivery strategy for these schemes and there is still a degree of uncertainty over the implementation costs. Once the delivery strategy has been confirmed we will formally re-baseline the EFC. Although these schemes are not designed for revenue generation, the implementation cost will be funded through the income they generate.





We plan to have 175 rapid charging points installed by April



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travelling in the ULEZ is already compliant with the new emission standards.

We continue to install nitrogen dioxide (NO<sub>x</sub>) abatement equipment on buses. We have completed seven Low Emission Bus Zones, with the retrofitted vehicles now contributing significantly lower NO<sub>x</sub> emissions on these corridors.

The completed bus zones are:

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

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 NO<sub>x</sub> 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.

### **Ultra low emission vehicles - rapid charge infrastructure**

To support the growing use of zero emission capable taxis and electric

vehicles, we are building a network of rapid charging points across London. We had installed 150 points by 31 November, of which 64 are dedicated for taxis.

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

In addition, residential on street charging is being installed in 24 boroughs via the Go Ultra Low City Scheme programme.

Recognising the need for a strategic approach to electric vehicle infrastructure, the Mayor launched the Electric Vehicle Infrastructure Taskforce in May 2018, to look at how much public infrastructure might be needed in London by 2025 and to mitigate the barriers to implementing it. A Delivery Plan for electric vehicle infrastructure in London to 2025 will be published in the spring.

### **Assurance**

Project Assurance completed an integrated assurance review on the Air Quality and Environment programme submission to the Programmes and Investment Committee meeting on 11 December 2018. Eight recommendations were made and accepted, including three by the 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.



The two new Woolwich ferries will help deliver the Mayor's ambition to grow river transport and improve air quality



# Asset investment



Forecast completion year

**2021/22**

Spend to date (£m)

**221**

Spend authority (£m)

**303**

EFC (£m)

**585**

EFC movement post plan (£m)

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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.**

## Ardleigh Green Bridge replacement

The bridge replacement is progressing well, with the highway approach works due to completed in spring 2019. The final phase of the railway-side works has been re-scheduled from December 2018 to 2019 and we discussing with Network Rail to agree an alternative date. This has no impact on the highway works but may delay completion of the project. All costs associated with the re-scheduling and possible delay are to be borne by the principal contractor.

## Power Road Green Bridge replacement

All four carriageway lanes opened to traffic, on schedule, in November 2018. The remaining carriageway and footway works are progressing and are scheduled to complete in February 2019, followed by the removal of the site compound.

## Woolwich Ferry

The three old Woolwich ferries have been replaced with two new, modern, low-emission ferries and have increased capacity, cycle-specific facilities and use a quieter, low-emission engine. This all helps deliver the Mayor's ambition to grow river transport and improve air quality.

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. Spend authority is to the end of 2019/20.

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The new ferries provide 14 per cent more space than the old vessels and are able to carry 150 passengers, with a total of 210 metres of space for vehicles across four lanes and separate dedicated step-free areas for pedestrians and cyclists to improve accessibility.

The boats are powered by hybrid-propulsion engines, improving fuel efficiency and reducing noise. They are fitted with equipment to reduce emissions of diesel particulates by 90 per cent and NOx by 70 per cent, so they are compatible with the emission standards for the ULEZ.

Familiarisation and testing continued over Christmas with a loading trial held on 28 December 2018 with hired HGVs and transits on the Dame Vera Lynn.

### Coaches

We are working to ensure that Victoria Coach Station is maintained and fit for purpose. This includes fire detection and alarm system upgrade, improvements to customer information display systems, refurbishment of the existing ticket office, replacing toilet turnstiles, refurbishing toilets, and a study to understand the feasibility of repairing pavements around concrete bus stands.

### Bus driver facilities

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

Providing bus driver facilities ensures we can run a safe and efficient bus network and ensures our bus drivers have the basic facilities required at work.

Good progress has been made since the Mayor announced increased funding for bus driver facilities in February 2018. A total of 20 priority routes will have a facility installed by the end of December 2018.

We are currently working to deliver facilities on a total of 42 routes by summer 2019. 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 in October 2018. A quarterly update was provided to the Committee on 11 December 2018 on the 12 recommendations that were made and accepted, including five by the 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.



Work at Victoria Coach Station will improve safety and ensure it remains fit for purpose



# Public transport



Forecast completion year

**2021/22**

Spend to date (£m)

**153**

Spend authority (£m)

**347**

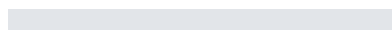
EFC (£m)

**394**

EFC movement post plan (£m)

**-4**

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

An Access for all scheme is under way at West Hampstead station. We are also acting as delivery partner to Crossrail to design and construct schemes at seven stations across the eastern and western sections.

We are continuing construction of the new ticket hall at White Hart Lane station to increase capacity and improve accessibility. We have completed extensive civil works associated with the new structure. The station and existing ticket hall remain operational throughout the works.

Works are under way at Willesden Depot following award of the contract to electrify the sidings.

We are designing a train protection warning system for the Richmond to Gunnersbury branch to enable us to interchange the fleet between lines and improve reliability across the network. Construction works will start in the summer.

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.

The EFC is £4m higher. This is mainly due to an increase in renewal spend from 2020/21 in trams and London Overground, offset partially by a reduction in the renewals programme in 2018/19.





Investment across the London Overground will help improve access and capacity

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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.

Our operator, Arriva Rail London, continues to run a full service of six trains per hour on the Gospel Oak to Barking line on weekdays. On weekends, there are four trains operating a 30 minute service, with a standby bus to supplement capacity at times of higher demand.

We continue to push Bombardier to do everything they can to enable us to bring the new electric trains into service as soon as possible. We are working with Arriva Rail London so that driver training can start as soon as the software issues are resolved.

We have extended the lease on the trains currently running on the line to allow for the delay to the new trains. Additionally, Bombardier will deliver an enhanced maintenance programme for the modified electric trains to ensure maximum reliability in this interim period.

The first modified electric four-car train ran from Barking to Gospel Oak at 06:48 on Monday 28 January, with the second one entering service on Tuesday 12 February.

## DLR

We have appointed a contractor to refurbish the CT30 DLR 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 enable 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 final commissioning works have been completed and the two new escalators entered service in December 2018.

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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 Rail Accident Investigation Branch. We have completed a number of initiatives and are now assessing options for track modifications, tunnel lighting and strengthening tram windows. The design of the iTram performance monitoring system is nearly complete, we are evaluating bids for tram emergency lighting and we have started the tender process for a system to physically prevent speeding.

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.

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.

Construction works have completed and regulatory approval has been gained for reinstating automated operations of the points at East Croydon tram stop. Following training of operational staff, this will improve local operations at East Croydon and increase the resilience of the tram network, particularly in the town centre.

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

Detailed design for the replacement of two Victorian bridges at Blackhorse Lane has been completed by Morgan Sindall and is being reviewed. 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.

A new payment solution support contract was introduced, which included the provision of new on-street keypads and payment software.

Santander Cycles achieved a third record year in a row for hires in 2018, with over 10.5 million journeys made.

### 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 an integrated assurance review on the Public Transport programme submission to the Programmes and Investment Committee meeting on 11 December 2018. Seven recommendations were made and accepted, including two by the 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.





The Bus Safety Standard will help improve safety both for bus passengers and for other road users





Weekly capping for buses and trams was successfully launched on 17 December

# Other

## Technology and data

Forecast completion year

**2019/20**

Spend to date (£m)

**44**

Spend authority (£m)

**168**

EFC (£m)

**151**

EFC movement post plan (£m)

**17**

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

Weekly capping for buses and trams was successfully launched on 17 December. An agreement was reached with the train operating companies on 28 November, allowing us to proceed towards a launch of weekly capping on rail in spring 2019.

### Evergreen programme

The procurement of 7,000 new thin client PCs is complete, with deployment scheduled from January to March 2019. We have deployed Microsoft Windows 10 and Office build to early adopters within Technology and data, with more planned for January 2019.

A total of 100 business and mission critical applications have now been migrated to Windows 10 (out of a total of 173), early adopters have been scheduled to start testing in January 2019.

### Content and collaboration

The SharePoint Legacy Consolidation project is now in the implementation phase, with the migration of SharePoint 2007 sites the first target. So far, 143 sites have been migrated to SharePoint Online, with 33 remaining.

The Livelink Upgrade project has also started implementation, commencing with the design and build of the test environment.

EFC is for the financial years 2018/19 and 2019/20. 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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### **Operating and monitoring systems**

We have installed all buses with new equipment under the Surface Radio Replacement project and have cut-over 90 per cent of the network to the new digital system. We are on target to complete the switchover and the core project on target within this financial year. Operational staff are already seeing the benefits of reduced call queuing times on the digital service.

The Future Bus Systems project has completed the discovery phase as part of the project to replace our obsolete bus scheduling tools: busnet, SSTT and Caesar.

The tender for the next phase of Surface Intelligent Transport System for a Common Operational View and Incident Management System has been released via the Solutions framework that, when delivered, will provide a common platform for all of Surface Transport's network management function, encompassing the functions currently in three areas of tunnels, bus and road management. The first phase is the real-time optimiser for traffic-light control project, which was let to Siemens, remains on target.

Surface Transport is re-procuring its outsourced taxi licensing business function and technology and data is working closely on the required systems provision and integration.

### **Hosting – data centre rationalisation and cloud migration**

We are 90 per cent complete in reducing our hosting footprint in our primary data centre by two thirds, with dilapidation activities starting in mid-January 2019. This will reduce our overall hosting operating costs by around £4.6m per year.

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.

### **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. 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 develop the cyber assessment framework, which will be used across the transport sector. The assessments of systems in-scope of NIS regulation are now under way, with the target completion and submission to the Department for Transport before the end of March 2019.

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## Data and analytics

We have developed a new in-house solution for hosting our customer database, which is helping save TfL thousands of pounds a year. This secure database was tens of millions of rows of contact and travel behaviour insight details. In the last month, this new customer database went live and has now been used as the source of customer data for many campaigns, including the weekend travel update, taxi and private hire, bus consultation, cycle hire monthly activity summary, London Overground night service and freight.

Our data is now easily accessible and up-to-date, ensuring we can contact the right customers at the right time with reduced setup time. The email customer information team can now run email campaigns themselves and create monitoring reports to see how well customers are engaging with our messages. This has saved £200k a year, with the opportunity for greater savings in the future.

We are continuing to provide 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

Following the transition of our network services in August, Capita has completed the migration of network assets from the legacy toolset to the new tooling based in the Capita Network Operating Centre. This brings the network fully under Capita's control and completes the transition activities. The core network that will form the basis for the transformed access network and WAN service has been built, tested and delivered, and a number of pilot sites have been successfully migrated onto the new core network and are fully operational in the transformed state. Further pilot sites will be added in 2019.

Since the signature of the new connect contract with Thales, the delivery of the radio system upgrade has started, with completion of the necessary factory acceptance testing on the new radio system hardware and software. Following this testing, equipment has been put into production for delivery and installation at the core site in West Kensington (one of five) in January 2019. The other core sites are on schedule to deliver for the anticipated change over in summer 2020.

We continue to deliver infrastructure to support the Home Office's nationwide Emergency Service Network programme. Across our 422km of tunnels, we have installed 218km of fibre optic cable and placed 301km of leaky feeder in a temporary position, of which 60km has been fixed into its final position. Cabling

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works at the first 25 stations is 90 per cent complete. We have agreed a further £10m of funding from the Home Office for works through to the end of the current financial year. Following a joint delivery options review with the Home Office, we are also now aligning the Emergency Services Network project with our telecoms commercialisation project with the aim of achieving delivery and cost synergies between Emergency Service Network works and the planned public cellular network services that we are looking to establish on the Underground.

#### **Technical refresh and technical-service operation**

We have published a contract notice to invite bidders to supply a service desk, desktside support and hardware repair and build services. These services are currently provided through multiple providers, and this procurement process will bring these services under a single contract and supplier. The new contract is expected to be awarded in Quarter 2 2019.

Our mission critical systems have been identified, prioritised for restoration and assessed in terms of resiliency. An options paper is now being written to address any required improvements in resiliency across these systems.

An analysis of IT service management tools in the marketplace has been conducted and BMC Remedy has been chosen as our next toolset. A project to deliver this new and improved toolset is now in the delivery phase.

We have completed a scoping and planning exercise to transition some third party managed services to our technology and data teams. The execution of the associated transition activities started in December 2018 and is due to complete in July 2019, resulting in approximately £1.2m reduction in annual operating costs.

#### **Contact centre operation**

As part of work to prepare for the predicted increase in items being found on the TfL network, an alternative site has been identified for the Lost Property Office. A decision on the long-term future of the premises at Baker Street will be made in due course.

The concessions contract was awarded to Charles Novacroft at the end 2017, with transition taking place since then. Service commencement for the new contract is 1 January 2019.

#### **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 December 2018 on the 11 recommendations that were made and accepted, including seven by the IIPAG. Eight recommendations are closed and good progress is being made to close the remaining three. Project Assurance tracks progress against the recommendations made, including by IIPAG, as part of its continuous assurance





We are inviting bidders to supply service desk, deskside support, hardware repair and build services under a new single contract

# The Growth Fund

Forecast completion year

**2024/25**

Spend to date (£m)

**0.4**

Spend authority (£m)

**144**

EFC (£m)

**144**

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.**

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.

## Existing Growth Fund schemes

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

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

## Sutton 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.

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### Shortlisted schemes

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

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

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

### Assurance

Project Assurance completed an integrated assurance review 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 December 2018 on the 11 recommendations that were made and accepted, including four by the IIPAG. Two recommendations are closed and 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.



# Elizabeth line



## On-network stations improvement programme

Forecast completion year

**2019**

Spend to date (£m)

**61\***

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 lift schemes at Maryland, Manor Park and Seven Kings, the final inspections for handover are due to be completed by 13 February 2019. This will enable all new infrastructure relating to the step-free works (bridges and lifts) to be brought into public use. Ahead of this, a section of the new footbridge at Manor Park was opened on 19 December 2018 which permitted, during the Christmas closure, the removal of the temporary footbridge that had been serving the station.

On the Great Western section lift schemes at Hanwell, Iver, Langley and Taplow, construction is progressing well with piling completed at most sites and foundation and lift pit construction under way. Steelwork installation planned for Christmas was postponed until mid-February following a review

of the programme. Completion is still scheduled for December 2019.

MTR Crossrail is continuing its station refurbishment programme. Work started in January 2019 on platform refurbishment activities, such as painting and decorating, at Brentwood, Harold Wood, Gidea Park and Romford. The installation of new shelters at Goodmayes and Ilford started in January 2019 and was completed at Chadwell Heath in December 2018.

Refurbishment of the western surface stations not being rebuilt by Crossrail have also progressed with schemes for West Drayton and Hanwell out to tender and the application for listed building consent submitted for Hanwell. Work will start on both these stations in early 2019.



Work continues on the Elizabeth line, including ensuring step-free access is provided at stations

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## Rolling stock

Forecast completion year	Spend to date (£m)	Spend authority (£m)	EFC (£m)	EFC movement post plan (£m)
<b>2019</b>	<b>939</b>	<b>1,149</b>	<b>1,035</b>	<b>0</b>

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.



# 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.**

In August 2018, Crossrail Limited announced that the opening of the central section between Paddington and Abbey Wood, which was due to open in December 2018, would be delayed. The new Chief Executive of Crossrail, Mark Wild, and his team are working on a robust and deliverable schedule to complete the final infrastructure and extensive testing required. The delayed opening is disappointing but ensuring the Elizabeth line is safe and reliable for our customers from day one is of paramount importance.

Core elements of the infrastructure being delivered by Crossrail Limited, including the stations and the fit out of the tunnels, are at varying stages of completion and more funding is therefore required to complete it, as well as the extensive safety and reliability testing needed for the new railway systems.

The Mayor and the Government have agreed a financial package to cover this. The GLA will borrow up to £1.3bn from the Department for Transport and repay this loan from the existing Business Rate Supplement and Mayoral Community Infrastructure Levy.

Because the final costs of the Crossrail project are yet to be confirmed, a contingency arrangement has also been agreed between us and the Government. This will be in the form of a loan facility from the Department for Transport of up to £750m.

The focus remains on finalising the remaining infrastructure and testing to get the Elizabeth line safely into passenger service at the earliest opportunity. The full opening of the railway, from Reading and Heathrow in the west to Shenfield and Abbey Wood in the east, will commence 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: red;">■</span>			
Train services on Hammersmith & City line use new signalling system between Hammersmith and Latimer Road	21-Oct-18	Spring 2019	■
Train services on Hammersmith & City line use new signalling system between Ladbroke Grove and Paddington	18-Nov-18	Summer 2019	■
Due to signalling software readiness issues, commissioning SMA0.5 (between Hammersmith and Latimer Road) was re-forecasted for spring 2019 and as a result, SMA 01 (between Ladbroke Grove and Paddington) has been delayed until summer 2019 and, through revenue gapping, the rest of the migration areas up to SMA 05 received new forecast dates. Discussions are taking place with Thales to find potential mitigation solutions to bring the commissioning dates forward			
<b>Deep Tube Upgrade programme</b> <span style="color: green;">■</span>			
Preferred bidder for new Piccadilly line rolling stock contract determined	12-Jul-18	15-Jun-18	■
Tenders returned for signalling and train control contract	15-Mar-19	24-Jan-19	■
This milestone is subject to ongoing change control following significant changes resulting from the 2018 Business Plan. A further update will be provided in the next quarter.			

Milestone description	Plan date	Actual/ forecast date	Status
<b>Network extensions</b>			
<b>Northern Line Extension</b> ■			
Nine Elms station civil works complete	26-Sep-18	25-Sep-18	Complete
Kennington station cross passage civil works complete	17-Sep-18	16-Sep-18	Complete
<b>Silvertown Tunnel</b> ■			
Preferred bidder selection dependent on national government support	28-Jan-19	22-May-19	■
<p><b>Q1: 93 days late</b> ■</p> <p><b>Q2: 93 days late</b> ■</p> <p>The contract award has been delayed by five months until July 2019 as additional ground investigation surveys had to be completed. However, the remaining land surveys were delayed due to the DCO 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><b>Q1: 197 days late</b> ■</p> <p><b>Q2: 197 days late</b> ■</p> <p>Tender returns for the Main Works Contract were received in July 2018, which were higher than the project authority. To achieve greater value a series of Value Engineering (VE) exercises were undertaken. The VE outputs were incorporated into a Best and Final Offer, which after further evaluation allowed the contract to be awarded in December 2018. We mitigated the contract award delay by procuring the critical overhead line electrification switch works as a separate package which were successfully completed during a Christmas possession.</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	Complete
All Victoria station passenger facilities available for use	03-Dec-18	19-Oct-18	Complete
Bakerloo line link passage ready for Crossrail trial running	30-Nov-18	30-Nov-18	Complete



Milestone description	Plan date	Actual/ forecast date	Status
<b>London Underground</b>			
<b>Stations renewals and enhancements</b> ■			
Improvement works complete at London Underground stations that interface with the Elizabeth line	09-Dec-18	09-Dec-18	■
Completed post quarter end on 19 December 2018. Completion of the works at Paddington station was delayed as some of the works needed an additional coat of paint.			
Finsbury Park is a step-free station	20-Mar-19	30-Dec-18	■
Post quarter end, provision of step-free access was delayed due to technical issues that arose during commissioning of the lifts between Christmas and New Year. The station became step-free in January 2019.			
<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	Complete
South Woodford is a step-free station	15-Mar-19	15-Mar-19	■
<b>Track renewals</b> ■			
Install 7.5km of new track across the Underground network	31-Mar-19	31-Mar-19	■
<b>Rolling stock renewals</b> ■			
75 per cent of Bakerloo line fleet refurbishment works complete	31-Dec-18	03-Oct-18	Complete
50 per cent of Jubilee line fleet mid-life refurbishment works complete	31-Dec-18	06-Oct-18	Complete
23 lift and escalator replacement and refurbishments complete	31-Mar-19	22-Dec-18	Complete

Milestone description	Plan date	Actual/ forecast date	Status
<b>Surface</b>			
<b>Healthy Streets ■</b>			
Highbury Corner gyratory – start construction	31-Aug-18	28-Jun-18	Complete
Highbury Corner bridge – construction complete	31-Aug-18	17-Jul-18	Complete
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-Oct-18	Complete
Old Street roundabout – start advance works on site	22-Feb-19	12-Nov-18	Complete
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	■
Dial-a-ride fleet renewal – Delivery of first vehicle	31-Dec-18	01-Dec-18	■
Local schemes – 75% of agreed regional improvement schemes complete	13-Jun-18	03-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	■
<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	■

Milestone description	Plan date	Actual/ forecast date	Status
<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	Complete
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	■
<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	■
<p>Q1: 123 days late ■</p> <p>Q2: 123 days late ■</p> <p>The Home Office (HO) has reviewed national Emergency Services Mobile Communications Programme (ESMCP), and announced a revised delivery approach for the programme. Following a joint review of delivery options between the Emergency Services Network and the Telecommunications Commercialisation Project, it has been agreed in principle with the Home Office to align the projects.</p> <p>This has the potential to deliver cost savings and delivery synergies, and we are aiming to release the ITT for the combined Emergency Services Network and Telecommunications Commercialisation Project scope in spring 19.</p>			
Submit planning application – Kidbrooke	04-Feb-19	27-Nov-18	■
Submit planning application – Blackhorse Road	29-Mar-19	17-Aug-18	■
<b>Elizabeth line</b>			
<b>Rolling stock</b> ■			
Elizabeth line passenger services start on central section between Paddington and Abbey Wood	Dec-18	TBC	■





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