

Date: 8 March 2017

Item: Investment Programme Report – Quarter 3, 2016/17

This paper will be considered in public

1 Summary

1.1 The Investment Programme Report describes the progress and performance in Quarter 3, 2016/17 of a range of projects that will deliver world-class transport services to London.

1.2 Quarter 3, 2016/17 covers the months of October to December 2016.

2 Recommendation

2.1 The Committee is asked to note the report.

List of appendices to this report:

Appendix 1 – Investment Programme Report Quarter 3, 2016/17.

List of Background Papers:

None

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Transport for London investment programme report

Quarter 3 2016/17

MAYOR OF LONDON



**TRANSPORT
FOR LONDON**
EVERY JOURNEY MATTERS

About Transport for London (TfL)

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

As a core element in the Mayor's overall plan for London, our purpose is to keep London moving, working and growing, and to make life in our city better. We reinvest all of our income to run and improve London's transport services and to make it safer, more modern and affordable for everyone.

Our operational responsibilities include London Underground, London Buses, Docklands Light Railway (DLR), London Overground, TfL Rail, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the Emirates Air Line.

On the roads, we regulate taxis and the private hire trade, run the Congestion Charging scheme, manage the city's 580km red route network, operate all of the Capital's 6,300 traffic signals and work to ensure a safe environment for all road users.

We are delivering one of the world's largest programmes of transport capital investment, which is building the Elizabeth line, modernising Tube services and stations, transforming the road network and making it safer, especially for more vulnerable road users, such as pedestrians and cyclists.

We work hard to make journeys easier through effective use of technology and data. We provide modern ways to pay through Oyster and contactless payment cards and provide information in a wide range of formats to help people move around London.

Real-time travel information is provided directly by us and through third party organisations, which use the data we make openly and freely available to power apps and other services.

We listen to, and act upon, feedback and complaints to constantly improve our services and work with communities, representative groups, businesses and many other stakeholders to shape transport provision in London.

Improving and expanding transport in London is central to driving economic growth, jobs and housing throughout the United Kingdom. Where possible, we are using our land to provide thousands of new, affordable homes. Our own supply chain creates tens of thousands of jobs and apprenticeships across the country.

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Introduction

This new Investment Programme quarterly performance report describes a range of projects that will deliver world-class transport services to London.

It includes projects and programmes with an estimated final cost (EFC) of £50m or more. Some significant smaller value projects may also be included to provide a rounded view of our whole Investment Programme.

For each of these projects and programmes we include a progress update, the key achievements in the quarter, and a summary of data at quarter end.

We also include the forecast year of completion for projects and programmes with a defined start and end. Rolling works that we deliver as a continual sequence of prioritised activities, such as carriageway resurfacing or track renewal, are denoted as 'annual'. This means they are controlled and measured within each financial year.

Financial records of spend to date and EFC where figures are whole-life. This represents the entire duration of each separate project or programme, except for annual portfolios where spend to date and EFC figures represent the current financial year.

Approval for programme and project authority is sought annually from the Programmes and Investment Committee, unless extraordinary approvals are needed. Where authority is significantly lower than EFC in this report, authority has been given for the current stage of works and further authority will be sought when appropriate.

This report does not contain commercially sensitive information and therefore some EFCs and authorities are marked with an asterisk (see below)

*

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.

2016/17 budget milestones – the key milestones listed in the TfL Budget document – are detailed in Appendix A (page 42).

An overall red, amber, green (RAG) status represents the average forecast date variance against plan in line with the following key:

On time or early:



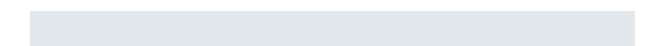
1-89 days late:



More than 90 days late:



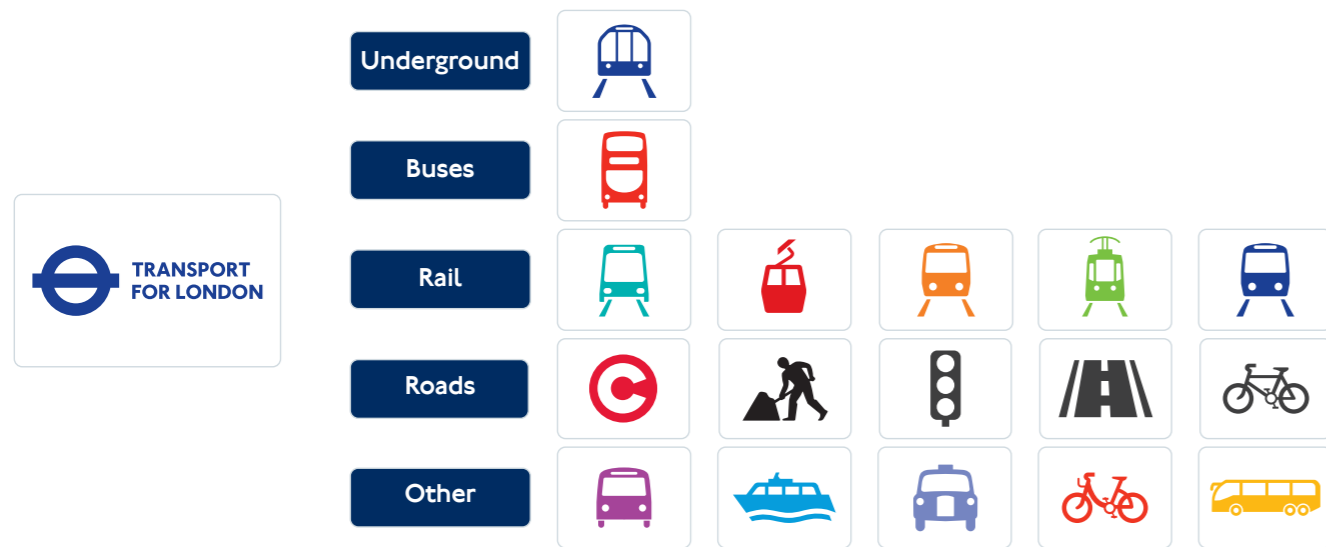
Schemes without 2016/17 budget milestones are marked:



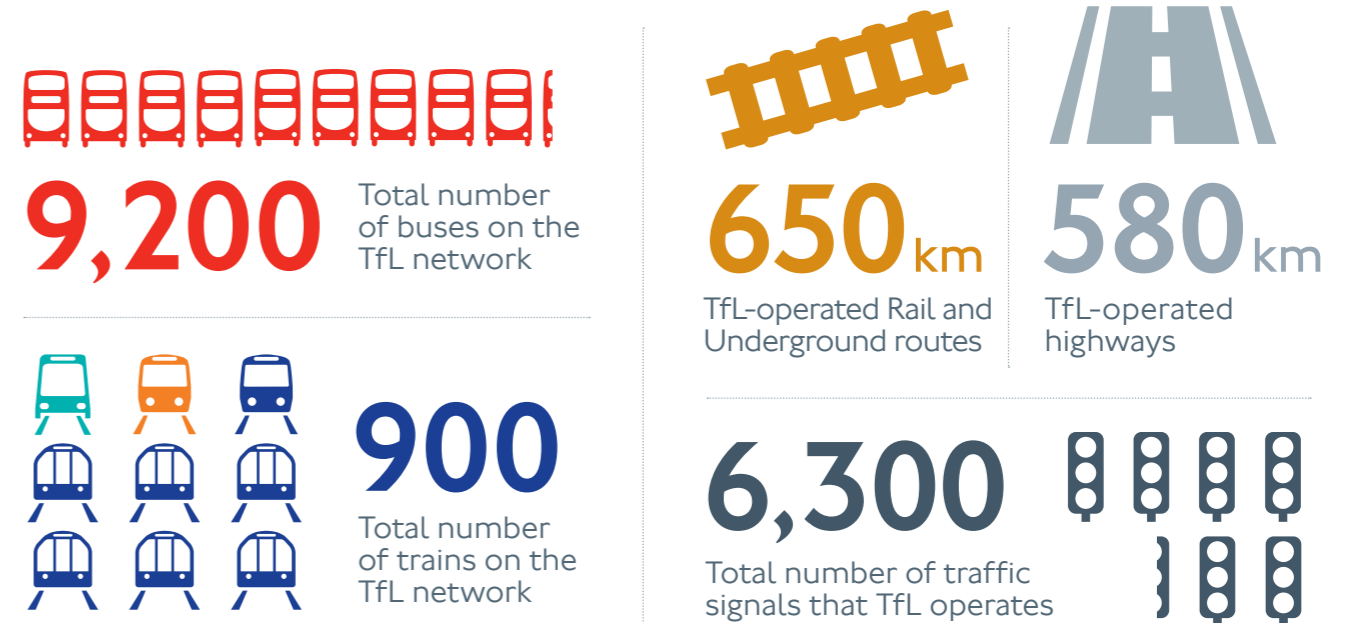
Business at a glance

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

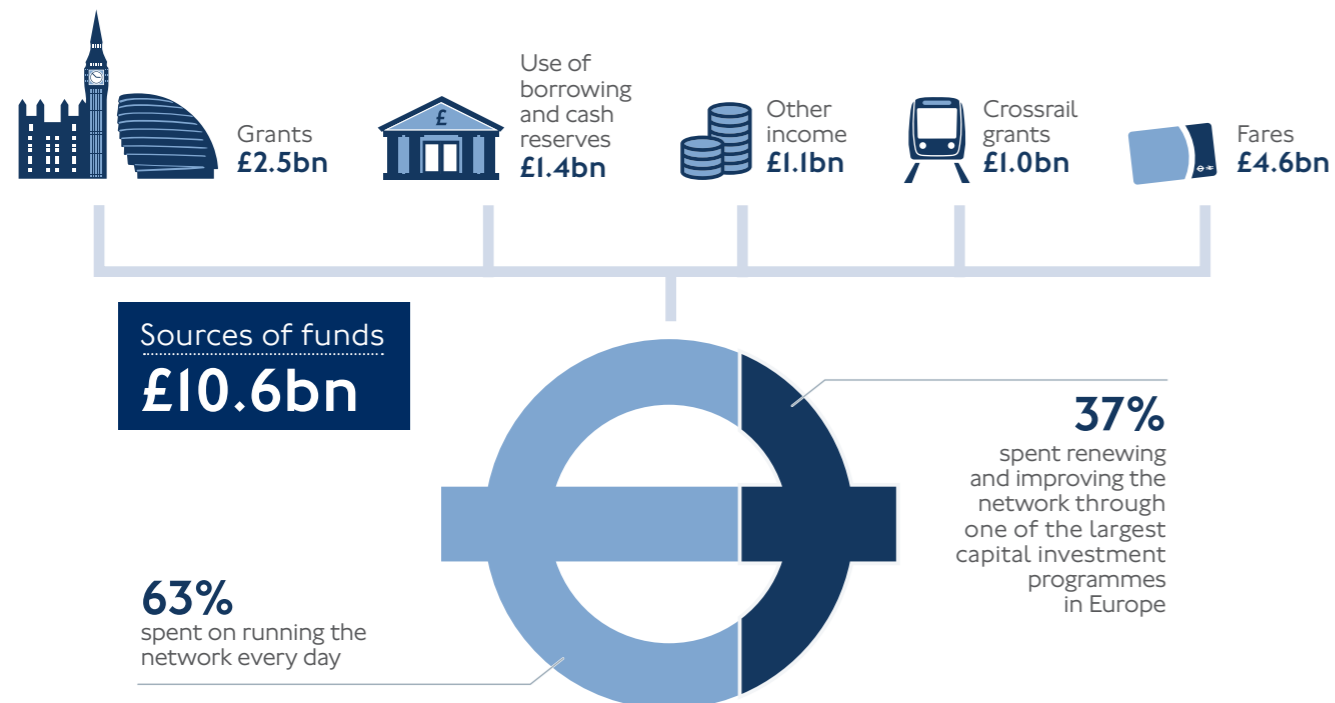
How we report on our business



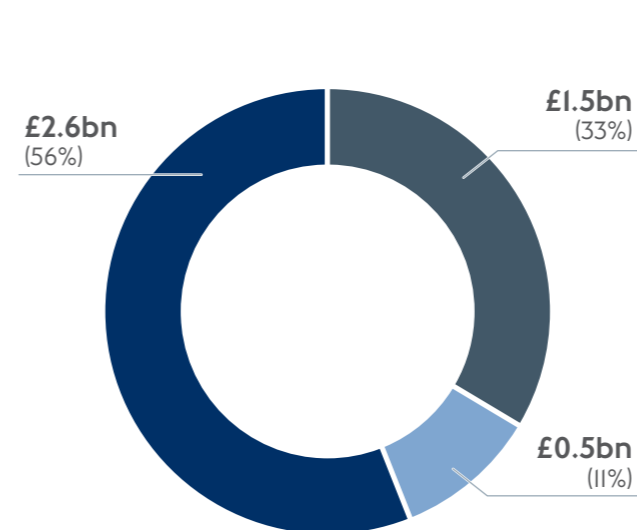
Facts and figures*



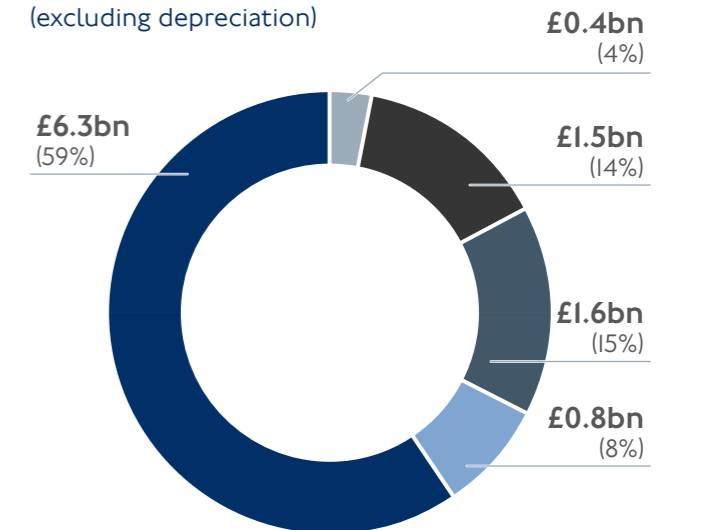
Finances at a glance*



Total fares*



Total costs* (excluding depreciation)



*Based on full year 2015/16

Key achievements

All 192 new S-Stock trains have been introduced – more than 50 days earlier than the Department for Transport’s (DfT’s) target date of 31 December 2016. The automatic train control (ATC) pre-production train completed testing in automatic mode and eight trains are being fitted with the ATC system.

The new Piccadilly line signalling control system, which we developed in-house, is now operating on the eastern section of the line. This reduces the possibility of signal failure and allows us to better monitor and control the line.

We continue major construction works on the Northern line extension. The huge reinforced crossover box at the Battersea Power Station site is complete and we continue to assemble the two tunnel boring machines. Ahead of schedule, we completed two large five-metre diameter sprayed concrete lined tunnels, which run from the Kennington shafts to the Kennington loop and will link to the existing Northern line.

On our major station upgrades, the new glass, north plaza entrance at Tottenham Court Road opened to the public before Christmas 2016 and we also completed the Bank Bloomberg Place tunnelling works and final breakthrough, and reinforced concrete works from the station box into the Waterloo & City line platform.

We installed a record 600 metres of new track in a single weekend, completing our summer campaign of work on the Northern line prior to the launch of Night Tube. We also delivered new track on the Heathrow branch of the Piccadilly line during midweek engineering hours to avoid weekend closures on this section of the line.

Crossrail remains on time and is more than 80 per cent complete. Five Elizabeth line trains are now built and the rolling stock test train was delivered to the Shenfield line in December 2016 to prepare for services to Liverpool Street from May 2017.

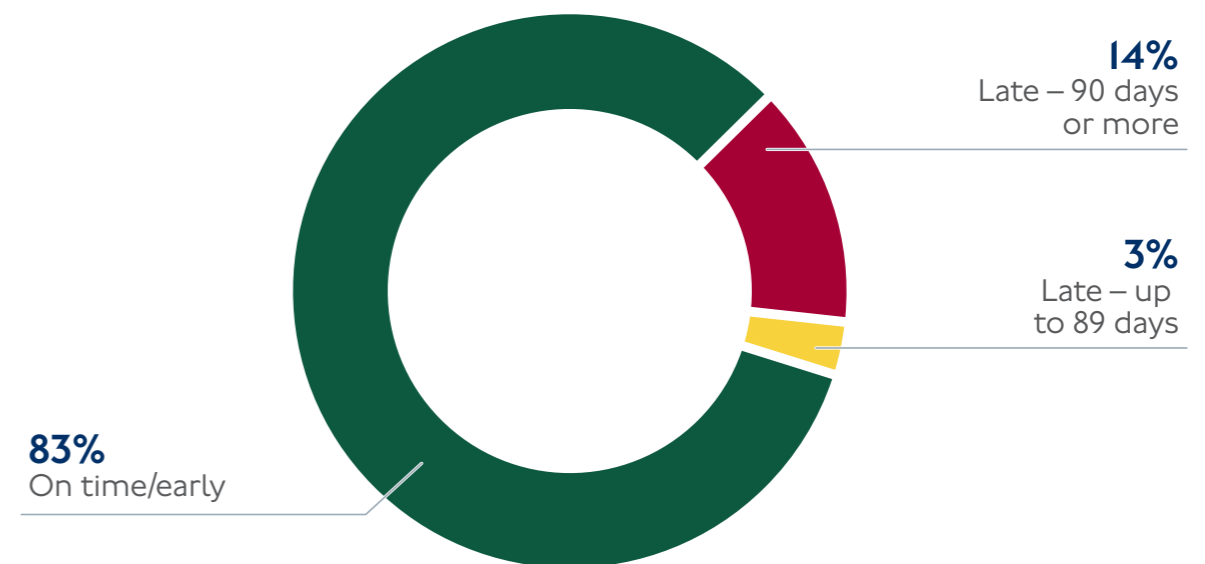
Work continues on the Cycle Superhighway programme, with eight routes comprising more than 60km of new cycling infrastructure now open for cyclists.

In October 2016, we published the procurement notice and the pre-qualification questionnaire for the Silvertown Tunnel project. In the same month, the Mayor announced the outcome of a review, which endorsed enhancements to the environment and public transport benefits.

To reduce disruption in the area by aligning works with other closures, we brought forward works to introduce a new two-way traffic system at Archway, which started on 17 December.

2016/17 Budget milestone performance

The overall performance for all TfL 2016/17 Budget milestones, which includes those not covered in this report, is summarised as follows:



The late milestone scores of 14 per cent (90 days or more late) and three per cent (up to 89 days late) are primarily driven by the late milestones detailed in Appendix A.



Underground

London Underground

Four Lines Modernisation S-Stock Train Roll Out

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2021	2,929	3,144	3,113

2016/17 budget milestone RAG: On Track

We have introduced 192 new trains on the Circle, Metropolitan, District and Hammersmith & City lines, together with associated depot, station, siding and signal modifications to accommodate them.

Roll-out of all 192 new S-Stock trains was completed in November

2016. We finished upgrade works at Uxminster and Ealing Common depots to provide the capability to stable and maintain the new fleet. We are also removing all 75 old District line (D-Stock) trains from operation and so far have disposed of 65. We plan to take the last D-Stock train from service in May 2017.

Four Lines Modernisation Automatic Train Control (ATC)

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2020	902	2,268	2,209

2016/17 budget milestone RAG: On Track

ATC systems control train movements, allowing more frequent and reliable services. We are providing ATC for our new S-Stock trains to increase capacity and improve journey times.

We completed testing of the pre-production train at the Derby test track, where it was operated under ATC. It has since transferred to our contractor, Thales, to start extensive dynamic testing in Quarter 4.

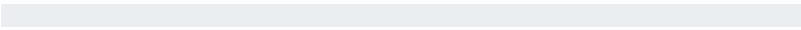
Eight S-Stock trains have arrived in Derby and are being fitted with the ATC system.

Thales is installing its ATC signalling equipment between Hammersmith and Euston Square. We handed over the first two of 50 signal equipment rooms to Thales to start installation works.

We have started ATC system simulator training at our Hammersmith service control centre.

Capacity upgrades modernisations

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2023	51	167	900

2016/17 budget milestone RAG: 

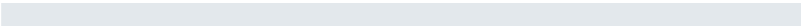
Capacity upgrades will increase the Victoria line service from 34 to 36 trains per hour (tph) by spring 2017, the Jubilee line from 34 to 36tph by 2021, and the Northern line from 24 to 30tph by 2023.

We completed work at Northumberland Park depot over Christmas, to prepare for the Easter 2017 signalling upgrade. We

also completed signalling control system software updates at West Hampstead over Christmas. The final elements of the Night Tube system software update have been coordinated with forthcoming Jubilee line upgrade West Hampstead works to avoid disrupting Night Tube services (required to allow for weekday commissioning of the signalling system).

Piccadilly line interim upgrade

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2018	21	47	46

2016/17 budget milestone RAG: 

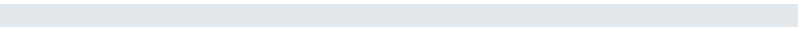
We are taking an interim step to replace the life-expired Piccadilly line control system and control centre ahead of a full line upgrade planned as part of our Deep Tube upgrade programme.

The new Piccadilly line signalling control system (developed in-house) was brought into service in October 2016. It controls the section of the line

between Cockfosters and Caledonian Road from a new, interim control room in west London. In late November 2016 we completed further commissioning, which extended this area of control from Caledonian Road to Earl's Court. This reduces the possibility of signal failure and allows staff to better monitor and control the line.

Deep Tube upgrade programme – design phase

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2018	63	154	120

2016/17 budget milestone RAG: 

The full upgrade programme will provide more capacity on the Piccadilly, Bakerloo, Central and Waterloo & City lines, plus new signalling systems and 250 new-design, high-capacity, walk-through, air-cooled trains.

We received three bids for the rolling stock tender on 26 September 2016 and are evaluating these. Findings from an independent review of the signalling and

train control tender documents were positive and we completed several review report recommendations. We plan to issue the invitation to negotiate in April 2017.

The HM Treasury Infrastructure and Projects Authority (IPA) completed a full review as part of its Routemap process that reviews major infrastructure programmes. The IPA issued a final report and feedback was very positive.

Northern line extension

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2020	*	*	*

2016/17 budget milestone RAG: 

This project will provide a twin-tunnelled extension from Kennington to a new terminus at Battersea Power Station via a new station at Nine Elms. It will provide new transport infrastructure for the Vauxhall Nine Elms Battersea Opportunity Area.

Following major excavation works at the Battersea Power Station site, the reinforced crossover box is complete. We have begun excavating the two tunnels in and out of the new station, from where

the two tunnel boring machines we are currently assembling will launch in March. The machines will pass through the new Nine Elms station, which we are already excavating and constructing.

We completed two five-metre diameter sprayed concrete lined tunnels ahead of schedule. These tunnels, one 220 metres and the other 77 metres in length, run from the Kennington shafts to the Kennington loop and will link to the existing Northern line.

Victoria station upgrade

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2018	506	677	592

2016/17 budget milestone RAG: On Track

We are increasing the south ticket hall size by 50 per cent, building a new northern ticket hall, providing step-free access and 300 metres of subways to meet the needs of the 80 million customers that use the station each year.

Following testing and commissioning of the new station systems and six escalators, and completion of the architectural finishes, we opened the new northern ticket hall in January.

This is the first major element of the new station to open to customers.

Lift installation works continue and step-free access opening is planned for the northern ticket hall later in Quarter 4.

We completed piling for the westbound link and, once complete, this will provide step-free access between the extended southern ticket hall and the westbound District and Circle lines platform.

Tottenham Court Road station upgrade

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	467	538	475

2016/17 budget milestone RAG: On Track

Our upgrade is reducing congestion and providing step-free access and Crossrail interchange, as well as a larger ticket hall, new escalators, and connections to all lines with entrances at street level and plaza.

We completed the new north, glass plaza entrance, which opened to the public before Christmas 2016. The refurbished Dominion entrance, the new Central line passageway, and the emergency exit

tunnel and stairs opened at the same time. Step-free access was provided on 6 February.

The old Paolozzi tiled 'Church Window' was relocated from the demolished entrance to the new passageway.

The project won the prestigious Great Western Railway Craft Skills Award for the work on Paolozzi mural mosaics.



Bond Street station upgrade

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	287	308	308

2016/17 budget milestone RAG: 

We are providing the greater capacity required for when the connected Crossrail station opens. This includes new lifts, step-free access, more escalators and a new entrance to the north side of Oxford Street.

We continued escalator and lift installation, walls and finishes works during the Christmas period and will

open the new facilities in June 2017. We plan to complete Stratford Place works at the end of July 2017.

The over site development will follow as a separate project to allow the focus to remain on the station opening.

The project won a gold Green Apple award, which recognises environmental best practice.

Bank Bloomberg Place

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	45	58	58

2016/17 budget milestone RAG:* 

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

The tunnelling works and final breakthrough, plus reinforced concrete works from the station box into the Waterloo & City line platform, are now

complete. The fit-out of the passageway to the Waterloo & City platform is under way.

Following redesign of the sprinkler valve chamber, an alternative design solution was accepted by the London Fire and Emergency Planning Authority (LFEPA) and the detailed design is now under way.

The City of London is continuing with local area improvements.

*This represents the 2016/17 milestone 'Back of house fit-out complete'. The project completion milestone remains on target for the end of 2017.

Bank station capacity

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2021	270	623	628

2016/17 budget milestone RAG: 

We are increasing the capacity and providing a quicker interchange for customers. These works include a new Northern line southbound tunnel and a new station entrance on Cannon Street.


We began excavating the main tunnel access shaft, after utilities were diverted and potential obstructions were removed. The Museum of London visited during these early works and discovered several artefacts.

We installed the concrete mix storage silos and built a new gantry crane to serve the tunnel access shaft. We continue to demolish buildings on the Cannon Street site on schedule.

Inside the station, we are installing new digital station cameras and fibre optic cable and have begun constructing a new station operations room. We also began building a new cable shaft for relocating the station power supplies.

Vauxhall station upgrade

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	27	35	33

2016/17 budget milestone RAG: 

We are reducing congestion by increasing station capacity and reducing the risk of unplanned station closures. We have delivered step-free access from ticket hall to platform level.

With its recently installed lift from platform to ticket hall, Vauxhall now provides a fully accessible interchange between rail, bus and Tube services.

Subway five has reopened and we continue remedial works to both the electrical installation and ceilings, with the main focus on the ticket hall and subways. This will be followed by back-of-house areas including station staff accommodation and equipment rooms. Completion is forecast for April 2017.



Future Stations programme

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
Mid-2020s	10	18	789

2016/17 budget milestone RAG:

As London grows and demand for services increases, our stations need to keep pace. This programme assesses how long-term demand growth will impact stations and where upgrades are most needed. It covers capacity upgrades and feasibility studies for improvements.

We held meetings with local businesses to discuss proposals for the Camden Town station upgrade and construction operations.*

We finalised the concept design for the Holborn capacity upgrade and we completed feasibility design for Walthamstow.

The planning application was granted for the redevelopment of the former Royal Mail site at Paddington (including provision for improvements to the LU station and area around Praed Street).

*A public consultation seeking feedback on proposals to build above Camden Town Tube station and to create a new entrance on Buck Street started in January 2017.

Integrated Stations Programme

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2018	139	333	333

2016/17 budget milestone RAG:

Twenty-three stations are undergoing improvements, including five stations that interchange with the Elizabeth line, to keep them safe, maintainable and able to operate.

The modernisation of the Northern line ticket hall at Charing Cross remains on schedule for reopening in July 2017, following its planned closure in September 2016. Changes will include

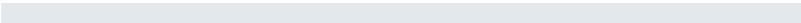
new tiling and finishes, a new gate line, more space at the top of the escalators and improved CCTV and lighting.

We started the main works to ticket hall B at Liverpool Street and floor tiling at Moorgate is substantially complete.

We finished concept design for the new canopy at Ealing Broadway and eight stations continue through concept design and detailed design.

London Underground Crossrail works

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2019	260	290	297

2016/17 budget milestone RAG: 

The Elizabeth line will be fully operational in 2019, connecting Reading and Heathrow in the west to Shenfield and Abbey Wood in the east. We are supporting Crossrail with the design and build of five stations.

We worked with Crossrail to provide alternative access routes at Moorgate so customers could avoid station closures during works. We delivered these works more efficiently by using existing protection measures instead of erecting additional hoardings.

Track and drainage renewals

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
Annual	128	186	172

2016/17 budget milestone RAG: 

To continually improve reliability, reduce maintenance costs and allow capacity increases, we are replacing our ballasted and deep Tube track, points and crossings, and improving track drainage infrastructure.

We replaced more than 3.5km of ballasted track, 1.4km of deep Tube track and 1.2km of drainage in Quarter 3.

On the Northern line, we installed a record 600 metres of new track in a

single weekend, completing our summer campaign of work ahead of the launch of Night Tube. We continue to deliver new Piccadilly line track near Hounslow West during midweek engineering hours to avoid weekend closures on this section.

We replaced the manually operated points in Hammersmith depot with a new electrically operated Surelock system in preparation for signalling by our Four Lines Modernisation (4LM) programme.

Power upgrades

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2020	462	521	496

2016/17 budget milestone RAG: 

We are providing traction and signalling power supply upgrades to replace obsolete equipment and support the capacity and service frequency increases being delivered by our line modernisations.

We are continuing work on a scheme where waste heat from the Northern line will be piped into homes via Islington's Bunhill Energy Centre. We started demolishing existing structures and this is progressing well at City Road (on the Northern line

between Old Street and Angel) ahead of a planned ventilation system upgrade and chilled air system installation, with commissioning planned for September 2017. We are also removing the redundant mechanical installation at Lisson Green.

In support of the 4LM programme, we awarded a contract to Siemens to stabilise power quality, improve the quality of electricity feeds to our network and improve the reliability of electrical assets.

Rolling stock renewals

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2024	108	249	699

2016/17 budget milestone RAG: 

We are extending the life and maintaining the safety and reliability of our trains until their replacement under future upgrades. We are also enhancing engineering vehicle fleet capacity and capability.

We awarded the first contract for the Central line Improvement Programme on 2 December 2016. This will replace the unreliable and obsolete data transmission system, which sends data between the trains and the signalling system.

To maintain the structural integrity of Bakerloo line trains until they are replaced by new stock, a programme of repair works is under way. Works to the eighth train of the fleet continue on schedule. We are developing a plan to either extend the life of or replace the track recording vehicle (TRV) capability. The TRV is nearing the end of its life and remains critical to monitoring Jubilee, Central, Northern and Piccadilly line track geometry as these fleets are not fitted with automatic track measuring systems.

London Underground lifts and escalators

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2035	354	766	1,044

2016/17 budget milestone RAG: 

Our fleet of lifts and escalators require refurbishment and renewal to provide continued safe and reliable use for our customers.

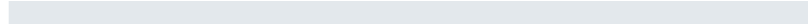
We continued lift replacement works at Lambeth North and completed these in Quarter 4. The station reopened on 13 February.

We completed the majority of civils works on escalator 3 at Liverpool Street. We returned escalators at Green Park and Euston to customer service following completion of major refurbishment. We also returned an escalator to customer service and started full replacement on another at Chancery Lane.

We returned an escalator to customer service at West Ham three days earlier than planned, and at Canary Wharf we completed one escalator nine days early and immediately started work on another.

Information communication technology transformation

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2018	30	36	62

2016/17 budget milestone RAG: 

We are improving capability to support delivery of our priorities of safety, reliability, capacity, and transformation of customer service, including the upgrade of operationally critical and safety-related systems.

Following deployment of mobile devices to operational staff, work to ensure a continued, supported mobile service provision is nearly complete. We are enabling maintenance staff to remotely access, capture and update maintenance data by providing mobile functionality to all relevant staff. This is complete in 19 out of 20 asset areas and we expect to finish this by the end of May 2017.

We are enhancing our ability to remotely view CCTV from more stations. Detailed design reviews continue and 50 per cent of station surveys are complete.

We are also enhancing customer information at Circle, Metropolitan, District and Hammersmith & City line stations. At Ladbroke Grove we installed new electronic information boards that display train arrivals and destinations.

Buses

London Buses

Cleaner and greener buses

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	316	347	347

2016/17 budget milestone RAG: On Track

A further 200 New Routemaster vehicles are being introduced to bring the total to 1,000 by 2017. No further Routemasters will be ordered.

A total of 874 New Routemasters were in service at the end of Quarter

3 following the conversion of route 21. A total of 27 routes are using these diesel-electric hybrid buses, with 601 now having the cleanest Euro VI engine. We have fitted opening windows to 715 buses in the fleet.

Bus priority delivery portfolio

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
Annual	7	12	13

2016/17 budget milestone RAG: On Track

We are developing the bus network through new or improved infrastructure, including bus priority schemes. Key schemes being delivered in 2016/17 include Loampit Vale in Lewisham and Plumstead Road in Greenwich.

Since April 2016, 95 bus priority schemes, which exceeds the target of 90, have been delivered and are improving journey times.

The Royal Borough of Greenwich's Plumstead Road scheme, which

involves a large section of bus lane and a segregated cycle lane, is nearing completion. The Loampit Vale scheme in Lewisham involves the construction of a large section of new bus lane on the Transport for London Road Network (TLRN) and is due to be complete by the end of Quarter 4.

We expect to deliver 148 schemes on TLRN and borough roads during 2016/17, all of which will improve bus journey times, and we continue to develop schemes for the future.





Rail

DLR, London Overground, London Trams, TfL Rail and Emirates Air Line 🚆 🚇 🚊 🚝 🚉

On-network stations improvement programme

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2019	17	94	94

2016/17 budget milestone RAG:

This programme focuses on the 22 existing stations, ensuring improved and step-free customer experience and a common family of stations across the entire Elizabeth line.

Continuing improvement works at the 11 eastern section stations remain planned to complete in 2017. External renovations

and internal upgrades at Phase 1 stations (Ilford York Road, Manor Park and Seven Kings) are substantially complete. Phase 2 works (Chadwell Heath and Brentwood) continue and Phase 3 works will start next quarter. A temporary footbridge was installed and complex demolition works completed at Manor Park. A single option is being finalised for the western section.

Crossrail rolling stock

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2019	307	1,091	1,091

2016/17 budget milestone RAG:

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

Five trains are now built and, in December 2016, the test train was delivered to the Shenfield line to prepare for services to Liverpool Street from May 2017. We are also now ready to start testing the automatic train control system at the Melton Mowbray track. This system will be used on services between Paddington

and Abbey Wood from December 2018. Network Rail started fitting the new European-standard signalling system to the Heathrow branch for train testing in spring 2017 ahead of Heathrow to Paddington services from May 2018.

At the Old Oak Common depot, we are continuing to construct the train maintenance and washing buildings, laying the sidings and carrying out foundation works for the automatic train inspection.

Crossrail

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2019	*	14,800	*

2016/17 budget milestone RAG: 

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

The project remains on time and within the funding envelope (the committed funding) of £14.8bn. It is now more than 80 per cent complete.

Crossrail's central section construction programme remains focused on fitting-out the tunnels, shafts and portals. A number of significant milestones were achieved this quarter including:

- A blockade at Ilford Yard to allow stabling to be available for the first of the new Class 345 trains between Shenfield and Liverpool Street in May
- Completion of floating track slab which is used to reduce noise and vibration beneath Tottenham Court Road station

- Handover of eastbound and westbound platforms tunnels at Liverpool Street to the systemwide contractor for fit-out

Surface finishes are being applied to public spaces with glass fibre reinforced concrete cladding panels being installed in Farringdon, Bond Street and Tottenham Court Road stations. Track installation continues and more than 70 per cent has now been completed.

During the 10-day Christmas period, more than 4,000 workers carried out in excess of 330,000 hours of essential Network Rail Crossrail works on both east and west surface sections. Efforts continue at the new Abbey Wood station and the 'manta ray' timber roof structure, which will cover the two new Elizabeth line tracks, is taking shape.

As part of improvements for the Crossrail project, plans for a new station building in Ilford were approved by the London Borough of Redbridge.

*Crossrail will open in five stages from May 2017 until December 2019. The Elizabeth line (Stage 3) is December 2018.

London Overground Stations Capacity Programme

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2018	20	29	39

2016/17 budget milestone RAG: 

We are increasing capacity at some of our busiest London Overground stations. This includes work to reduce peak period congestion and improve accessibility at Dalston Kingsland and West Hampstead stations.

We continue the design for West Hampstead station to improve the entrance and access to the platforms. Initial site access and vegetation clearing works have

started and we are identifying solutions to some unforeseen ground conditions.

The new station will provide step-free access to both platforms via lifts on a new wide footbridge. It is designed to accommodate future growth in customer numbers, with more gates and a much larger customer circulation area. The design also incorporates a widened pavement and integration with the Ballymore housing development and public square.

Barking Riverside extension

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2021	10	*	*

2016/17 budget milestone RAG: 

We are delivering a new rail link to serve the 10,800 new homes planned for the Barking Riverside development area. Our preferred option is to build a spur from the Tilbury Loop line east of Barking to allow our service to extend to Barking Riverside.

We continue the procurement process to deliver the Barking Riverside 4.5km extension and, after evaluating the pre-qualification questionnaire

responses received, we shortlisted three bidders: Balfour Beatty, Carillion PLC and VolkerFitzpatrick Morgan Sindall joint venture.

If the Transport and Works Act Order application that we submitted to the Secretary of State for Transport in March 2016 is approved in spring 2017, construction could start in late 2017 with train services starting in 2021.

Roads

Transport for London Road Network (TLRN)



Assets Capital programme

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
Annual	50	82	82

2016/17 budget milestone RAG:

The Assets Capital Programme is an annual programme of maintenance and renewal that lengthens the life of infrastructure assets relating to our roads.

This quarter we resurfaced more than 65,000 square metres of carriageway at locations including A10 Great Cambridge Road (northbound), A13 Whitechapel High Street junction with Commercial Street, A232 between Ewell Road and Roberts Close, A3220 between

Finborough Road/Fulham Road and Old Brompton Road and A406 Stirling Way.

We also replaced almost 10,000 square metres of footway along A3220 Earls Court Road, A3 Kennington Park Road and A41 Finchley Road.

Other works included replacing 342 conventional lights with energy-efficient LEDs and 221 lighting columns on the A102 between Blackwall Tunnel and the Sun in the Sands roundabout.

Safety camera replacement programme

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	34	37	35

2016/17 budget milestone RAG:

The programme's core objective is to maintain the existing road safety benefits provided by safety cameras by replacing life-expired wet film cameras with digital units.

We have replaced 387 of 397 spot speed cameras and 234 of 235 red light wet film cameras with digital units to date.

Three average speed corridor trials are now live on the A40, A406 and A316 and are being enforced by the Metropolitan Police Service. A fourth trial is planned for Quarter 4 on the A2.



Silvertown Tunnel project

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2023	20	*	*

2016/17 budget milestone RAG: 

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

We published the procurement notice and the pre-qualification questionnaire on 3 October. The Mayor also announced the outcome of a review that endorsed environmental enhancements and public transport benefits.

The Development Consent Order process began in October. Public hearings for the examination process were held on 12-13 October and 7-8 December. We responded to written representations from stakeholders in November and questions from the Planning Inspectorate in December.

An assurance review of the tender documentation is under way ahead of the invitation to negotiate to bidders in April.

Better Junctions core programme

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2020	41	46	65

2016/17 budget milestone RAG: 

The programme aims to improve safety at junctions and gyratories for cyclists and other vulnerable road users.

Archway gyratory works are 80 per cent complete. To coordinate with bridge replacement works at Upper Holloway Road, we introduced a new two-way traffic system earlier on 17 December.

At Stockwell, we finished our improvements for pedestrians in October

and made further safety improvements to the cycle route in December.

We are finishing detailed design for Westminster Bridge (south), which includes introducing zebra crossings at some bus stop bypasses to address stakeholder concerns. We completed the Hammersmith gyratory concept design in October. Lambeth Bridge (north) Phase I construction works started on 4 January and will complete by spring 2017.

Cycle Superhighway programme

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	161	162	255

2016/17 budget milestone RAG: 

Cycle Superhighways provide safer, faster and more direct cycle routes from outer London into central London. Eight routes comprising more than 60km of new cycling infrastructure are open for cyclists.

Cycle Superhighway East-West from Tower Hill to Parliament Square completed on schedule in April. We started works at Constitution Hill in October 2016 and completed works at Lancaster Gate in December. We also completed resurfacing

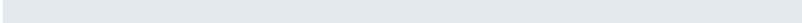
work in Hyde Park and opened the cycle track in December. Works continue in and around St James's Park.

The first phase of the North-South route completed on schedule in April and is now open. The Phase 2 public consultation on Snow Hill Junction closed on 13 December and detailed design will start shortly.

On CS7, works to upgrade Balham High Road completed in December 2016.

Cycling Mini Hollands

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2021	24	28	101

2016/17 budget milestone RAG: 

This programme will provide significant investment in local areas and town centres, transforming them for cyclists and creating better places for everyone.

Of the 102 schemes (97 infrastructure and five supporting measures), we have received submissions for 67 infrastructure schemes for review and 10 schemes are physically complete.

The London Borough of Waltham Forest is on site delivering a further 10 schemes

including Walthamstow Gyratory, Walthamstow Town Centre, Walthamstow Village, and Lea Bridge Road.

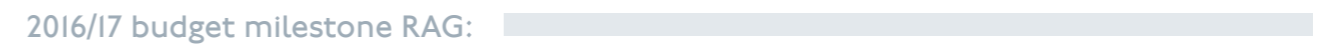
The London Borough of Enfield continues construction of the A105 Green Lanes scheme and has completed the first TLRN scheme at Bull Lane.

The London Borough of Kingston continues with a trial closure at Surbiton Crescent.



Central London Cycling Grid

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2019	20	33	53



This is one of the key infrastructure programmes in the Cycling Portfolio, comprising a network of Cycle Quietways and Cycle Superhighway routes through central London and the City, mainly on quieter streets.

carriageway markings and the City of London has started to install wayfinding signs. We have received designs for 81km of the network, of which 78km are approved.

Construction of the core network (around 85km) continues, with almost 45 per cent (36km) complete or under construction. The Royal Borough of Kensington and Chelsea has introduced wayfinding

We have identified improvements to 27 TLRN junctions as key to delivering consistent cycle routes with safe crossings of busier roads. Ten of these are complete and all boroughs (except Westminster) have submitted draft wayfinding schedules to us for approval.

Cycling Quietways

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2021	19	43	120



The programme will deliver around 30 routes, totalling more than 250km over Greater London, which were chosen to best align with current and predicted future cycling demand and will complement the Cycle Superhighways and Mini-Hollands programmes.

where construction has already begun on four routes.

Our delivery partners are developing wayfinding schedules for launches of completed sections in 2017.

Construction is either complete or under way on 47km of new routes. Of this, 33km are the first seven Phase 1 routes and the remaining 14km are Phase 2,

Consultation is complete or under way on a further 62km of routes (where 35km are Phase 1 and 27km are Phase 2), which are planned to start in 2017.

Road Space Management (SCOOT)

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	23	34	24

2016/17 budget milestone RAG: 

We are installing Split Cycle Offset Optimisation Technique (SCOOT) technology at 70 per cent of London's traffic signals to improve traffic flow by allowing signals to intelligently respond to real-time traffic conditions.

A total of 900 additional SCOOT sites are now active through the RSM SCOOT programme and operating under Urban Traffic Control (UTC), which operates

the traffic signals, typically in groups, using centrally-controlled timing plans. Measured benefits have provided an average of 13.5 per cent traffic delay saving as a measure of journey time before and after SCOOT has been implemented. We are in the process of closing the programme to deliver cost savings to the business as we have delivered the sites that provide the highest level of benefits.

Surface Intelligent Transport System (SITS)

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2021	7	*	*

2016/17 budget milestone RAG: 

The aim of SITS is to reduce delays for all road users by delivering an enhanced traffic signal control system with a predictive capability that will provide faster, automated responses to live road conditions.

We continue engagement with suppliers to replace our UTC and SCOOT traffic signal optimiser systems through a partnering arrangement. The partnership will deliver the replacement systems

and provide intellectual property rights for development and exploitation of the SCOOT software.

The Programmes and Investment Committee granted approval in November for the programme to continue to procurement stage and contract award for the UTC SCOOT partnering agreement and incident management system is planned for summer 2017.

Ultra Low Emission Zone

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2020	4	*	*

2016/17 budget milestone RAG: 


We plan to introduce an Ultra Low Emission Zone (ULEZ) and a portfolio of associated Air Quality Measures in the capital to significantly improve air quality and, in turn, the health of Londoners.

Following consultation on the Mayor's Air Quality proposals last year, we are developing a wide-ranging portfolio of measures including an Emissions Surcharge on the Congestion Charge, new hydrogen buses, new rapid charging points and a central London ULEZ.

We have enabled the award of 16 ULEZ compliant bus routes, which will deliver 400 ULEZ compliant double-deck buses into service by March. Procurement activity has started to award a framework contract for the supply of nitrogen oxide (NOx) abatement equipment on buses. Work is under way to deliver an Emissions Surcharge by the autumn.



Other operations

London Dial-a-Ride, London River Services, Taxi & Private Hire, Santander Cycles, Victoria Coach Station and other 

London Road User Charging (LRUC) and Traffic Enforcement Notice Processing (TENP) Contract Re-let

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	74	77	75

2016/17 budget milestone RAG:

We have re-let the TENP and LRUC contracts to consolidate and simplify the services after the expiry of the current contracts. The new service offers enhancements and increased self-service capability to customers.

Following the delayed but successful go live of the new systems and services in September, the service has transferred to operations. The programme will be closed in summer 2017.

Cycle Hire re-let

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2018	14	52	42

2016/17 budget milestone RAG:

We are delivering an improved Cycle Hire operating model. Contracts will transfer to the new supply chain in 2017, who will develop service enhancements, such as Single Sign On, for go live in 2018.

We are delivering implementation activities following contractual finalisation for back office and on-street fixed assets (with Cubic) and the bike supply and maintenance contract (with Serco), which includes a new bike design.

The incumbent service provider, Serco, is fully engaged in exit planning activities for areas of Cycle Hire that have previously been designated to transfer to other providers, such as on-street fixed assets, contact centre, web, and back office systems.

Contract award for the new contact centre and cleaning service providers was approved in December 2016 along with final design options for the mobile app and website.

Customer experience – Future Ticketing Programme Phase 3, 4 and 5

Forecast completion	Spend to date (£m)	Spend authority (£m)	Estimated final cost (£m)
2017	16	36	43

2016/17 budget milestone RAG:

We are making ticketing more convenient for our customers while reducing fare revenue collection costs. We are providing further benefits for Oyster and contactless customers, including a new mobile ticketing app and improved online processes.

We continue development of Phase 3, which will improve contactless card processing to prepare for increased volumes and revised card scheme rules, and we are planning a Visa Europe contactless pilot for Quarter 4.

On Phase 4, we evaluated an early version of the ticketing app and a customer pilot started in December 2016. We are testing the mechanism to allow faster delivery of travel products to gate lines, ready for customer launch in spring 2017.



Appendices

Appendix A: 2016/17 Budget milestone performance

The TfL 2016/17 Budget milestones for the projects or programmes covered in this report are listed below. The red, amber, green (RAG) status indicates delivery forecast against the current plan date in line with the following key:

On time or early
 1-89 days late
 More than 90 days late

Variance commentary is provided on milestones that are forecast to be delivered significantly (more than 90 days) late.

London Underground

Milestone description	Plan date	Actual/ forecast date	RAG
Four Lines Modernisation S-Stock train roll-out			
Roll-out of new air-conditioned trains on the District line complete	31-Dec-16	10-Nov-16	Complete
Last D-Stock removed from normal operational service (We decided to retain some D-Stock until May 2017 to provide more time for the fleet maintenance regime for S-Stock to be fully established)	31-Dec-16	May-17	■
Platform train interface nosing stone moves complete (The decision to retain some D-Stock until May 2017 impacted the start of the nosing moves at some platforms where the move is incompatible with D-Stock at these stations)	31-Mar-17	30-Nov-17	■
Four Lines Modernisation Automatic Train Control (ATC)			
Thales installation starts at South Ealing test track (This milestone was removed from scope to realise associated cost savings)	08-Sep-16	-	■
Thales installation start for Sloane Square to Paddington (Circle)/Barons Court/Fulham Broadway/Olympia (migration area 05)	28-May-16	07-Apr-16	Complete
Thales occupation at Hammersmith Service Control Centre	21-Jul-16	25-Apr-16	Complete
Guideway data gathering complete	05-Dec-16	15-Aug-16	Complete
Hammersmith depot conversion Phase 4 (Roads 6, 8, 9 and 10) physical works complete	04-Feb-17	24-Aug-16	Complete

Milestone description	Plan date	Actual/ forecast date	RAG
Farringdon City siding concept design complete	15-Oct-16	12-Oct-16	Complete
Pre production (V2) train handed over to Thales (S8 and S7)	09-Nov-16	02-Nov-16	Complete
Hammersmith service control centre available for pilot training	28-May-16	07-Apr-16	Complete
ATC final design review 2 complete	07-Mar-17	12-Dec-16	Complete
Information control system final design review complete (This milestone date has moved to complete actions that were raised at the design review. Hardware is being procured to mitigate delay and any impact on the start of training)	15-Oct-16	12-Dec-17	■
Tranche 1 - Euston Square to Monument/Stepney Green signal equipment rooms available to Thales (Design issues meant we needed a redesign of Aldgate, and we are reviewing Tower Hill following construction queries raised by our principal contractor)	23-Jul-16	10-Mar-17	■
Tranche 3 - migration areas 02, 07, 08, 09, 11 & 14 signal equipment rooms available to Thales (We reworked the design at Harrow-on-the-Hill to change the planned location of the SER to accommodate the planned commercial development at the station, which is a Mayoral priority)	31-Mar-17	11-Jul-17	■
Tranche 2 - migration areas 04, 05, 06 & 11 signal equipment rooms available to Thales (Following the discovery of asbestos at Embankment, the start on site was delayed and this has also impacted the start on site at West Kensington)	07-Jan-17	04-Oct-17	■
Northern line extension			
Battersea crossover box retaining walls, piles and plunged columns all complete	02-Jul-16	10-May-16	Complete
Battersea station box initial civils design issued for construction	19-Jul-16	17-Jun-16	Complete
Battersea station box retaining walls, piles and plunged columns all complete	20-Mar-17	19-Apr-17	■
Tottenham Court Road station upgrade			
Erection of glass frame to north plaza entrance	30-Sep-16	15-Aug-16	Complete
New passenger facilities open including new entrances to the station and new ticket hall	20-Nov-16	20-Dec-16	Complete

Milestone description	Plan date	Actual/ forecast date	RAG
Bond Street station upgrade			
Tunnelling set up decommissioned	18-Jul-16	24-May-16	Complete
Bank Bloomberg			
Back of house fit-out complete (The project experienced delays at the start and we continue to try to mitigate this where possible)	30-Dec-16	20-Jun-17	■
Bank station capacity			
Start on site	16-Jun-16	25-Apr-16	Complete
Victoria station upgrade			
Hand back north ticket hall worksites to Land Securities	31-Dec-16	29-Jul-16	Complete
South ticket hall station operations room complete	31-Dec-16	16-Jan-17	■*
North ticket hall complete	31-Dec-16	16-Jan-17	■*
Integrated Stations Programme			
South Kensington - finish on site	30-May-16	22-Feb-16	Complete
Holland Park - completion of closure works (station re-opens)	01-Sep-16	31-Jul-16	Complete
Sloane Square - start on site (Following approval of the business plan, work is now being undertaken to re-scope the station in line with the revised budget)	14-Nov-16	07-Mar-17	■
Track and drainage renewals			
Cumulative 16 per cent of track replaced on Four Lines Modernisation and Bakerloo, Central, Victoria and Waterloo and City lines	31-Dec-16	17-Jun-16	Complete
Renew points and crossing units - achieve 16 units	31-Mar-17	13-Mar-17	■
Ballasted track renewal and re-ballast - achieve 13,500 metres	31-Mar-17	13-Mar-17	■
Track drainage renewal - achieve 7,000 metres	31-Mar-17	13-Mar-17	■
Deep Tube renewal - achieve 6,448 metres	31-Mar-17	13-Mar-17	■
Power upgrades			
Key enabling works completed for high voltage network resilience cable installation	30-May-16	09-May-16	Complete

*Completed in Quarter 4 on 16 January 2017

Milestone description	Plan date	Actual/ forecast date	RAG
Final remote terminal unit delivered to site for the west end of the District line high voltage traction	25-Jul-16	13-Jun-16	Complete
Gate 6 review undertaken of east end of the District line high voltage traction substation upgrades	06-Oct-16	05-Oct-16	Complete
Contract recommendations delivered for Power Asset Renewals portfolio	28-Nov-16	28-Nov-16	Complete
Rolling stock renewals			
Central line traction card overhaul of 90 trains complete	29-Mar-17	29-Mar-17	■
London Underground lifts and escalators			
St Johns Wood station - bring into use escalator 3	03-May-16	05-Apr-16	Complete
Completion and consent to operate report approved for Elephant & Castle return to service lift 1	05-Jul-16	18-May-16	Complete
West Ham station - bring into use escalator 5	22-Aug-16	22-Jul-16	Complete
Chancery Lane station - bring into use escalator 1	23-Jan-17	28-Nov-16	Complete
Crossrail rolling stock programme			
Driver training simulator available at Ilford	31-Jan-17	27-Sep-16	Complete
First train (class 345) delivered to Ilford for provisional acceptance	28-Feb-17	22-Feb-17	■

Buses

Milestone description	Plan Date	Actual/ Forecast Date	RAG
New Cleaner and Greener Buses			
Delivery of 800 New Routemasters	31-Jul-16	06-Jun-16	Complete
Bus Priority Delivery Portfolio			
Construction completed for 50 per cent of top 24 Borough Reliability and Growth schemes	31-Mar-17	03-Mar-17	■

Rail

Milestone description	Plan date	Actual/ forecast date	RAG
London Overground Stations Capacity Programme (LOSTAT)			
Start on site at West Hampstead station	07-Jan-17	07-Nov-16	Complete
Start on site at Hackney Central station (We removed this project from the programme as part of a reprioritisation exercise.)	31-Mar-17	-	■
Barking Riverside extension			
Completion of GRIP 4 design submissions to London Overground	31-Mar-17	31-Mar-17	■

Roads

Milestone description	Plan date	Actual/ forecast date	RAG
Silvertown Tunnel			
Development Consent Order application acceptance	24-Jun-16	31-May-16	Complete
Invitation to negotiate issued (The start of the procurement process was postponed to allow the Mayoral review to take place.)	02-Feb-17	25-Apr-17	■
Better Junctions core programme			
Oval Triangle construction complete	31-Mar-16	23-Mar-16	Complete

Milestone description	Plan Date	Actual/ Forecast Date	RAG
Stockwell Gyrotory completion of works (including urban realm)	22-Jan-17	23-Dec-16	Complete
Cycle Superhighway (CSH) programme			
CS7 completion of construction (excludes Balls Pond Road)	01-Jul-16	24-Mar-16	Complete
CS2U completion of construction	08-Jul-16	26-Apr-16	Complete
CSH North-South completion of construction Phase I (St George's Circus to Stonecutter Street)	18-Jul-16	28-Apr-16	Complete
CSH East-West completion of construction Parliament Square to Tower Hill (except potential permanent scheme at Trinity Square)	22-Jul-16	05-May-16	Complete
Cycling Quietways			
Completion of first two routes	31-Dec-16	15-Dec-16	Complete
Road Space Management SCOOT			
A total of 900 sites enabled (cumulative)	28-Oct-16	29-Sep-16	Complete
Surface Intelligent Transport System (SITS)			
Procurement started	21-Oct-16	25-Jul-16	Complete
Ultra Low Emission Zone (ULEZ)			
Appoint taxi grant and compensation scheme delivery agent	29-Sep-16	01-Sep-16	Complete

Other

Milestone description	Plan date	Actual/ forecast date	RAG
London Road User Charging (LRUC) and Traffic Enforcement Notice Processing Contract Re-let			
LRUC service go live	03-May-16	26-Sep-16	Complete
LRUC operations review	31-Mar-17	31-Mar-17	■
Cycle Hire re-let			
Bike maintenance and supply contract award	30-Sep-16	28-Sep-16	Complete

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