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21 October 2019

Dear Florence,

As usual, the Crossrail Board meeting in September looked closely at cost and risk on the project. We still expect to open the central section of the route within the previously announced six-month window between October 2020 and March 2021, however, this is the most difficult and challenging phase of the Crossrail programme with significant integration and testing to complete. Crossrail continues to actively manage the three critical paths which are train and signalling software, tunnel systems, and stations, shafts and portals.

We have initiated a programme of activities to keep remaining programme milestones to schedule as well as further developing cost control and risk mitigation.

As per my previous update, our cost forecasts show that the project's costs could increase if all the identified risks and uncertainties were not mitigated. Projections still show the central cost forecast (including risk contingency) of £15,005m, £42m more than the funding committed under the financing package.

Additional modelling scenarios that we have carried out with a significantly higher level of risk contingency, currently show up to £392m could be required above the committed funding, with the Elizabeth line opening later in 2021. We continue to fully develop our cost forecasts and risk mitigation actions including quantifying the potential savings that could arise from their implementation. These will be further developed ahead of the November Board meeting.

We are in an intensive phase of testing which can flag up any bugs or defects with systems. We continue to see positive performance against our schedule baseline and in the context of the various risks and opportunities, we still expect that the project can be delivered within the financing package agreed by our Sponsors in December 2018. We have not requested any additional funding and still expect to begin the Trial Running phase in early 2020, although there are still risks that this could be delayed if they are not mitigated.

The recent Crossrail Board meeting held in October included discussions around milestones that were planned, delivered or missed in the most recent period. Pressures remain but interventions are in place to improve productivity. The organisation is working tirelessly to ensure all milestone dates can be met. We also now have a good understanding of what is required in terms of assurance, but the scale remains a challenge which we are working to optimise.

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We also held the next Strategic Partner Forum with executives from across our supply chain as well as architectural suppliers to ensure we are all aligned and focused on achieving the same stretch targets at this crucial stage of the project.

### **Safety**

On health and safety, overall performance remains under scrutiny following the serious accident at Farringdon station in September where two scaffolders were injured when the scaffolding they were installing collapsed. The 'Safety Stand Down' was well received and executed by the whole programme leading to improvement action plans being implemented. The investigation is nearing completion and wider learning will be shared. The safety alert ensured immediate action was taken to check all working at height practices.

In response to the tragic death of a colleague working for one of TfL's contractors at Waterloo London Underground station, Crossrail stood down all intrusive escalator works and ensured that contractors reviewed all safe systems of work before any activities recommenced. We will continue to work closely with TfL to learn from any incidents on their network.

Following recent concerns by workers at Bond Street about air quality and the level of ventilation on site, independent air quality monitoring has been undertaken. Any concerns raised have been followed up and investigations have confirmed there is a safe working environment. All dust, oxygen and air movement readings to-date have been within required limits. On behalf of Costain Skanska Joint Venture, 4-Rail Services Limited have completed an extensive independent air quality survey which has involved a combination of personal and static dust monitoring. All results to date have been below the Workplace Exposure Limits as detailed in Health & Safety Executive guidance. Measurements for gases, which include Carbon Monoxide, Nitrogen Dioxide and Nitrogen Monoxide amongst others, have also been undertaken throughout the site, again with level well below the documented Work Exposure Limits. Additional independent air quality monitoring has been undertaken by ParkHealth. Air quality monitoring at the Bond Street site continues.

### **Central Section Progress**

Following on from handing over Victoria Dock portal and Pudding Mill Lane portal to the Infrastructure Manager (IM), some issues remain with Mile End shaft which was due to be the next of the shaft and portals to be handed over.

One of the causes of the delay is a fire alarm control panel which needs to be upgraded to meet the standards required for the railway - there are 31 instances of these fire panels across the rest of the stations, shafts and portals with work underway to accelerate the upgrade process. We are confident this will not affect the critical path, but it is typical of things that can be found in the testing phase.

We have a Handover Strategy and Plan which sets the way forward for 30 individual Handover Execution Plans (HEPs) which have been written for each station, shaft, portal and railway system. These set out the configuration of each element of the railway at each stage of completion. The strategy is all based on starting Trial Running as soon as practically possible. Five of the first elements to be handed over have been identified as learning elements from which we will learn key lessons for handing over the later, more complicated stations, shafts and portals. Tottenham Court Road station is one of these and we are pushing for an earlier



completion date as it is a large station that we can use to implement lessons for the later handovers.

Custom House station was due to be handed over later this month, but also had the fire alarm control panel that needed replacing. As it is one of the learning handovers we made it a priority and the new panel has already been installed and begun testing.

Last month we removed the hoarding in the integrated ticket hall at Farringdon. The Crossrail worksite went "PPE-free" this month as most of the major works at the station are now complete and personal protective equipment (hard hats and hi-vis jackets, trousers, glasses and gloves) are now no longer necessary for everyone on-site. Testing and commissioning work is still to be completed ahead of planned handover to London Underground as IM later this year.

Work to fully complete the central tunnels continues. We commissioned the system that is used for the railway's mobile communications system in early October and are on track to complete fit-out and testing of the tunnels by January 2020.

### **Main Dynamic Testing**

The Siemens software configuration (PD+10) was planned to be the first version capable of supporting entry into Trial Running. Whilst it was a step forward and good progress was made, testing in the Crossrail Integration Facility (CIF) identified some missing functionality and defects. As a consequence, the next configuration (PD+11) will be the candidate for the start of Trial Running.

PD+10 was installed in the central section in early October as planned and valuable reliability and functional testing continues whilst we await the next configuration. PD+11 is planned to be delivered for testing on the central section of the route in early December.

The use of PD+11 is still consistent with starting Trial Running early 2020 and the declared opening window for Stage 3 if it is at the right level of quality. If another revision of the software configuration is required (i.e. to PD+12), the opening window would still be valid, although under increased risk. The nature of software development means uncertainty will remain until we begin to test each version.

Siemens and Bombardier collaboration is now at the best it has ever been with senior resources co-located in Westferry Circus and the right level of CEO engagement, including recent meetings at Siemens' facility in Germany with senior officials from Crossrail, Siemens and Bombardier and regular meetings ongoing. This has been a major achievement for the programme and will ultimately de-risk the development and assurance process.

The transitions between the eastern and western interfaces with Network Rail's sections of the route are complex and securing availability of test slots from Network Rail has been challenging. Access has now been booked for both transitions (Great Eastern and Great Western Main Lines) but testing will continue, and further access may be required.



### **Operational Readiness**

TfL's maintenance team has taken on landlord responsibilities for Victoria Dock portal and Pudding Mill Lane portal following successful handovers from Crossrail. As the first elements to be handed over, Crossrail and TfL have been able to test the handover completion process and learn lessons which will be used for the remaining elements. Mile End Shaft and Custom House are due to be the next elements to be handed over.

Elsewhere, the maintenance team, based at its new Maintenance Depot in Plumstead, has been providing track inspection support. This enables TfL's maintainers to become familiar with the assets and locations prior to becoming the Infrastructure Manager. Simulated desktop exercises continue to be delivered for signalling, power and maintenance scenarios to rehearse the response from the operational and maintenance teams.

### **Network Rail**

Network Rail has begun the handover process for driver CCTV works and it is expected for full handover to be achieved by early November to support the delivery of Stage 5a TfL Rail services between Paddington (high level) and Reading from 15 December 2019.

Platform extension work at West Drayton and Slough is complete, whilst the final extension at Maidenhead is forecast for completion this month.

Nine car (full-length) trains have been introduced on some services between Paddington and Hayes & Harlington. This is a further step towards using full-length trains more widely. The full plan is to use the full-length (nine-car) trains for Stage 5a in December but it is unlikely that the software updates necessary will be tested and available in time for the introduction of Stage 5a services. It is likely that services will start with the seven car units currently used between Liverpool Street and Shenfield and the full-length units will be swapped in when available.

Station enhancement works continue at West Drayton, Hayes & Harlington, Southall, West Ealing, Ealing Broadway and Acton Main Line and are all anticipated to complete in late 2020.

The Contractor has been mobilised by Network Rail for the enhancement works at Ilford and Romford stations. VolkerFitzpatrick will be undertaking the main construction work at Ilford which is due to complete by the end of 2020. The construction programme for Romford will be finalised later this autumn.

Some amendments were needed to the Network Rail submission to the Office of Rail and Road (ORR) on the exemption for enhanced signalling (TPWS) which is required for December 2019. These exemptions have now been granted.

Kind regards



**Mark Wild**  
CEO