TRANSPORT FOR LONDON

BRIEFING NOTE

Subject: Weekly Mayoral update on Crossrail / Elizabeth line

Date: 19 December 2018

Manifesto commitment(s)	Mayor's Transport Strategy (MTS)
Not applicable	**A good public transport experience** **Proposal 57**: The Mayor, through TfL, will work with the DfT to open the Elizabeth line in 2019, with services initially providing 24 trains per hour through central London and increasing in frequency during the 2020s as demand requires.

1   Purpose

1.1   Weekly update to the Mayor outlining progress and challenges ahead of the launch of the Elizabeth line.

1.2   The Mayor is asked to **NOTE** this briefing.

2   Overall programme

2.1   On 10 December 2018 the Mayor of London and Government agreed a financial package of up to £1.3bn to cover the additional capital investment required to complete the Crossrail project. It will be repaid through London's Business Rate Supplement (BRS) and from the Mayoral Community Infrastructure Levy (MCIL). Full details of the arrangements are due to be confirmed on 19 December 2018.

2.2   Also on 10 December, Crossrail Ltd confirmed that following further analysis of readiness, it could no longer commit to an autumn 2019 opening date at this point in time and a revised launch date will be provided following additional analysis.

2.3   The Master Operational Handover Schedule (MOHS review), was completed on 30 November 2018 and was discussed by the CRL Board on 5 December 2018 and Sponsor Board on 10 December 2018.

2.4   The CRL Board did not accept the MOHS and instead directed that the work being led by Howard Smith to define a prioritised list of what is needed for the launch of Stage 3 services should be incorporated into the revised schedule before it is finalised and communicated.

2.5   The delivery plan will continue to include revised target date ranges for delivery of Stage 2 Phase 2, Stages 4 and 5 and potential for a Stage 5a (services running from Paddington (high-level) to Reading). ▮▮▮ dates for critical activities and key milestones will continue to be used to drive contractor performance.

2.6   Development of the MOHS has confirmed the two critical paths to Stage 3 are:

- routeway completion, testing, trail running and trial operation; and

- completion of stations and integration of their systems.

3   Safety

3.1   All sites have continued with their "Finish Safe" campaigns to ensure that all teams are reminded of the paramount importance of conducting all work safely. Sites are also focussed on safe shut down and start-up procedures over the Christmas and New Year period. In addition, the increase in high potential near misses particularly those relating to electrical safety and permit procedures was the focus of a special health and safety meeting with contractors last week.

3.2   Last week there were no reportable or lost time incidents nor any high potential near misses recorded.

4   Weekly progress reporting:

Testing and Commissioning

4.1   Dynamic testing window 14 took place from 7 to 10 December 2018. This was an important precursor to main dynamic testing which is due to commence by 14 January 2018. Testing window 15 will take place 4-7 January and includes signalling testing in the central tunnels as well as testing the signalling transitions from the tunnel onto the east and west surface sections.

4.2   Details of the tests carried out and results are included in Appendix A.

4.3   The independently-chaired readiness group met on 12 December 2018 to assess readiness four weeks in advance of main dynamic testing. The group concluded that main dynamic testing could commence on 13/14 January (exact date dependent on finalisation of shift patterns).

Resourcing and Systems integration

4.4   The recommendations in the report for CRL by PA Consulting on systems integration are now being taken forward. PA Consulting has produced an implementation plan for CRL to take forward its recommendations particularly around enhancing programme integration. The overall organisational structure is being finalised by Mark Wild with a revised senior leadership team to be announced this week. In addition, CRL is working on its business plan for 19/20which will strengthen the resource in place to complete the project.

5   Train production and testing

5.1   A detailed update on progress with Bombardier is provided in Appendix A.

6 Stations

6.1 The delivery schedule includes Tier 1 Substantial Demobilisation dates (TOSD), staged completion and handover dates for the stations. Achieving the TOSD dates is critical in reducing CRL's periodic spend. Four TOSDs for shafts and portals have been achieved with four further TOSD dates are due to be achieved this week at Custom House, Woolwich, Farringdon and Eleanor Street shaft.

6.2 Further work is being undertaken to gain complete clarity on stations, shafts and portals staged completion dates which are critical to the standing up of the infrastructure managers and readiness for trial operations and passenger services.

7 Network Rail (NR) works

Stage 5:

7.1 NR presented three funding papers to the NR/DfT portfolio Board meeting earlier in December covering the ████████ for the six western station enhancement works, cost pressure on other core contract activities and allocation of funds from Control Period 6 which commences 1 April 2019. A submission is due ████████████████████████████ ██████████████.

7.2 Pending progress on the funding issues above, NR has not yet ████████████████████ ██████████████ bidder for Package 3 (Southall, Hayes, and West Drayton). The ████████████ for Package 2 (Acton, Ealing Broadway and West Ealing) ████████████ ██████████.

7.3 NR is continuing its enabling works on western stations to assist in maximising use of the Christmas works period by contractors.

7.4 Ilford and Romford station upgrades are fully funded and enabling works will be undertaken at Christmas. Detailed design is complete and the early contractor involvement process has been carried out. The contractor for Ilford has been requested by NR to revise the baseline schedule to deliver the works due to the previous use of inaccurate possession information.

7.5 NR remains publicly committed to delivering these station upgrades by December 2019. However, stakeholders have been informed that completion of Ilford and Romford station upgrades is now expected in 2020. In addition, deliverability concerns for the approved canopy at Ealing Broadway are being discussed.

8 Approvals for each stage

8.1 The schedule of submissions, assurance and approvals required will form part of the revised delivery schedule.

9 Appendices

9.1 **Appendix A:** TfL Bombardier Weekly Report

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Elizabeth line – Bombardier Weekly Report 17 December 2018

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Note No: 37

<u>Key Activities and Issues</u>

- 57 trains have been completed in Derby by Bombardier (BT). TfL has ████████ ██████████████████████████████ pending delivery of further validated software to allow greater use of the units on Network Rail infrastructure, and further reliability improvement of the existing fleet. The actions being taken are summarised below. The intention is to re-start train delivery so that the remaining fleet can be accepted by summer 2019 with deliveries at a steady and sustainable rate.

- Four 7-Car trains continue to be used on TfL Rail services between Paddington and Hayes & Harlington based at Old Oak Common. Ten 7-Car trains are available for passenger service on the Liverpool Street to Shenfield line.

- Bombardier's reliability growth plan is based on the mean distance between service affecting failures (MDSAF, a standard industry measure based on any delay over 3 minutes caused by a train fault). MDSAF in the last Period (8) was 5100 miles, below the target of 7800 miles. BT have a number of initiatives to drive improvement including finding a place in the wider software programme to update the 7-Car unit software (currently linked to 40% of failures), speeding up physical modifications, driving key suppliers harder, and increasing the resource at Ilford where the 7-Car units are based.

- Baseline tests of CBTC signalling and associated software for the Central Section tunnels were completed in September. In order to pass the full suite of 29 tests updates are needed to: BT's TCMS software (R7.2.2.6), and ETCS software (PVI 6.2) to fix up to 12 issues and Siemens must update their CBTC software to fix a further 3 (the date for the last fix forecast for 4 April).

- The latest Crossrail 'test window' took place from 7 to 10 December. This was focused on testing Siemens new release of wayside and train software (PD-3). The trains used performed well and provided a stable platform for testing. In terms of the tests of the wayside software, virtually all tests were completed with 10 out of 11 CBTC regression tests completed successfully. A number of CBTC 'route accessibility' tests failed because of an issue with releasing routes after the passage trains (holding points in position) and some inaccurate or incorrectly coded wayside balises, which had to be removed. These issues are being addressed urgently by Siemens in advance of the next test window (TW15) at the beginning of January.

- The start of Main Dynamic Testing (MDT) in the Central Section tunnels is planned for 13 January. This will use software configuration 'Y0230' (TCMS 7.2.2.6 as above + Siemens PD_4). Assurance submissions for this combination are due to be submitted by Bombardier 21 Dec. Further assurance from both Bombardier and Siemens and as well as confirmation of the robustness of CRL's own processes will be required for authorisation of multi-train testing in the COS.

- Good work has taken place over the last few weeks to optimise the programme for Siemens and Bombardier software for the period of MDT and to rationalise the requirements of assurance activities, so as to improve the robustness of the overall Crossrail programme and also allow some time and resource for testing of the Stage 2 'Heathrow' software. There is a now a single, synchronised programme for BT and Siemens software releases and deployment in the period through to July 2019.

- Bombardier continues to validate the 9-Car software to be used for running in passenger service on Network Rail infrastructure to allow the 9-Car units to be used on passenger trains between Paddington and Hayes & Harlington. This will help build reliability prior to full use in the tunnels. The first test runs took place 21-22 November. There is some unreliability, including loss of the driver information screens. Mitigations have been identified (including resetting the ETCS system when the train completes a journey and turns round) but it is not clear if these will be acceptable operationally. Reliability also needs to be demonstrated in running on the Great Western Main Line. The earliest at which passenger services could start is late January.

- The build of Release 7.3 on-train software is complete. This will be used for Heathrow services utilising the European 'ETCS' signalling system. Testing on rigs has been completed and the next iteration 7.3.1 is being prepared. BT have been updating their programme to optimise use of test facilities (rigs and track) and identified additional specialist resource to cover two overlapping workstreams (the extended period of dynamic testing in the central tunnels and finalisation of Heathrow software). A revised programme for Heathrow showing passenger service approval 28 June 2019 has been provided to TfL and is still being reviewed for robustness. Driver training (nominally 14 weeks) would follow passenger service approval for the software.

- The milestones in previously included in Appendix A will be updated following the completion of the new Crossrail Master Operational Handover Schedule (MOHS).