

TRANSPORT FOR LONDON

BRIEFING NOTE

Subject: Weekly Mayoral update on Crossrail / Elizabeth line

Date: 16 October 2018

Manifesto commitment(s)

Not applicable

Mayor's Transport Strategy (MTS)

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 The Crossrail Sponsor Board on 15 October discussed the schedule and costs contained in Crossrail Ltd's (CRL) updated Remedial Action Plan. CRL had been asked to review the time, cost and risk allowances contained within its original Remedial Action Plan (submitted to Sponsors following the delay announcement) to provide greater confidence in the delivery programme and to ensure that sufficient additional funds are requested to complete the project.
- 2.2 CRL has reviewed its schedules to take into account the latest progress on site and recent contractor performance and has updated its high level delivery plan. This now includes a start of interim dynamic testing (1 shift x5 days a week) from mid-December and main dynamic testing (2 shifts x5 days a week) commencing mid-January.
- 2.3 Dates for Tier 1 contractors being substantially demobilised at the central stations have also pushed back but still demonstrate achievability of an autumn 2019 delivery.
- 2.4 CRL is in the process of finalising its overall MOHS (the master schedule) in collaboration with its contractors (including their supply chains), partners and infrastructure managers. It will be available in late October. ■■■■ dates for critical activities and key milestones will continue to be used to drive contractor performance. The MOHS will also include new target dates for delivery of Stage 2 Phase 2 and Stages 4 & 5.



3 Safety

- 3.1 There was one lost time incident last week [REDACTED]. There was also one near-miss [REDACTED]. Both of these are being investigated.
- 3.2 All sites have commenced a “Finish Safe” campaign to ensure that all teams are reminded of the paramount importance of conducting all work safely.

4 Weekly progress reporting:

- 4.1 CRL is in the process of creating a weekly dashboard, supplemented by commentary, for its Executive, Board and Sponsor organisations. It will contain information on performance against critical paths; project milestones; systemwide (including routeway) progress; rolling stock development; signalling progress; stations, portals and shafts (including IRNs, Phase 3 testing, outstanding works list); dynamic testing; and assurance documentation. The dashboard should be available by beginning of November.
- 4.2 The table below outlines the latest available IRN progress (actuals up to 15 October 2018) and look ahead for the routeway commodities which are the critical path for infrastructure readiness for Phase 4 Dynamic Testing.

	Fire main install	Fire main pressure test	Fire main flow test	Low voltage dist.	Pumped drainage install	Walkway install
Total IRNs ^	34	34	17	172	66	36
Total complete (actual)	13	6	0	18	10	10
% complete	38	18	0	10	15	28
To go	21	28	17	154	56	26
Delta in week	4	6	0	0	2	1
Next week look ahead	2	4	0	2	3	8
2 nd week look ahead	6	4	0*	4	6	4
Notes: metrics as at 15 October 2018 ^ the Total IRNs can change as the assurance programme progresses						

Testing and Commissioning

- 4.3 The independently-chaired readiness group review of entry into 5 day testing / 2 day construction will meet again on 9 November. This will assess progress against the detailed entry criteria covering train, infrastructure and signalling readiness. Internal



readiness meetings are also being held regularly and the detailed testing plans are being populated. Note that the recent independent schedule review concluded Autumn 2019 opening was compatible with starting 5/2 dynamic testing in January 2019, although the later that 5/2 dynamic testing starts the greater the risk to opening.

Systems integration

- 4.4 CRL has appointed a systems integration specialist who is reviewing the current status of systems integration activity. The review is due within two weeks and will include recommendations relating to revised structure, process, governance and accountabilities. It is likely that a substantial systems integration authority will be embedded within the existing Crossrail management structure. Interviews have been undertaken with CRL, BT, Siemens and MTR. The results of this review will be used to form the structure and personnel requirements for this new team.

5 Train production and testing

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

6 Stations

The new MOHS will be finalised later in October and will include Tier 1 Substantial Demobilisation dates, revised staged completion and handover dates for the stations.

7 Network Rail works for each stage

Stage 5:

- 7.1 The review of available options in regards to the expected [REDACTED] [REDACTED] for the western station enhancement works has continued. The need and options for [REDACTED] were discussed at the DfT portfolio board on 13 September and the Network Rail (NR) Executive Committee on 3 October. NR is pursuing [REDACTED] for this [REDACTED] and additional cost pressures on remaining scope. NR will update Crossrail Sponsors this week. It is also continuing to explore value engineering options for potential efficiencies.
- 7.2 Standstill letters have now been sent for Package 3 (Southall, Hayes, and West Drayton) notifying the successful and unsuccessful bidders. [REDACTED] [REDACTED]. Package 2 (Acton, Ealing Broadway and West Ealing) standstill letters [REDACTED], subject to NR commercial panel approval. Formal award is therefore anticipated at [REDACTED]. [REDACTED]
- 7.3 NR will continue enabling works on the western stations this month to assist in maximising use of the Christmas works period by contractors.
- 7.4 Contract award for Ilford and Romford station upgrades [REDACTED].
- 7.5 Local authorities are likely to challenge vigorously any reductions in scope. This could add to schedule pressure which will have already been extended by the potential need



to reprice the works. NR remains publically committed to delivering these station upgrades by December 2019.

8 Approvals for each stage

- 8.1 CRL met the Office of Rail and Road last week to discuss the schedule of submissions that will be made aligned with the revised MOHS due at the end of October.

9 Appendix

- 9.1 **Appendix A:** Joint TfL and Bombardier Weekly Report



Appendix A: Joint TfL and Bombardier Weekly Report

Elizabeth line - Bombardier Weekly Report 15 Oct 2018

Note No: 29

Key Activities and Issues

- 54 trains have been completed in Derby by Bombardier. TfL has [REDACTED] [REDACTED] 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 including the introduction of 9 Car units into passenger service on Networks Rail's infrastructure, planned for November. 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.
- Old Oak Common Depot is in full operation.
- 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). Bombardier's target is 7800 miles by 10 November. This is supported by a programme of modifications and activities, with progress with which is tracked weekly. Bombardier continue to defer making changes to the 7-Car train software to allow focus on adding functionality required for signalling on the 9-Car trains. MDSAF in the last full four weeks (Period 6) was 6516 miles (up from 3060 miles in Period 5). In the first 3 weeks of Period 7 the MDSAF is 5023 miles.
- The latest tests of CBTC signalling and associated software for the Central Section tunnels were completed on 26 September. Of the 29 formal tests undertaken, 12 passed, 17 failed (including the 2 that were previously 'under analysis'). Productive review sessions were held with Siemens, CRL and RfL on 27 September and 3 October and the necessary fixes are being programmed into releases by Bombardier and Siemens, for further testing from mid November. The complete programme was due to be confirmed at the end of last week but has been delayed a few days as some fixes were transferred back from Siemens to Bombardier last week.
- The start of Main Dynamic Testing in the Central Section tunnels has been moved back from 22nd October as the agreed entry criteria relating to completion and testing of infrastructure and train and signalling systems will not be met by that date. A further review of readiness will take place at the beginning on November.
- Bombardier continues to undertake work to validate the software which can be used for running in traffic hours on Network Rail infrastructure. This will allow the 9-Car units to substantially increase the mileage operated and will help build reliability prior to use in the Central Section tunnels. The target for making submissions to the necessary safety bodies remains 5 November although this requires assurance evidence from Siemens for



the on board equipment which does not yet have an agreed date for receipt, this is being followed up with Siemens.

- The build of Release 7.3 on-train software is now complete. This will eventually be used for Heathrow services utilising the European 'ETCS' signalling system. Bombardier's current programme delivers the R7.3 train software configuration tested and validated for passenger service by 6 February 2019 which supports a full introduction of passenger services to Heathrow at the [REDACTED]. However, TfL has asked for this programme to be reconfirmed and made robust given the need for further iterations of Release 7.2 for the central tunnels. Bombardier undertook this further programming exercise (managing 7.2 and 7.3 together) during the last week and is continuing work this week.
- In addition to the daily and weekly meetings between Bombardier, Siemens, Crossrail and TfL a project is now underway to further strengthen the Crossrail project's capability and resource to manage system integration. This is due to report in the next two weeks with implementation immediately thereafter.
- With a large amount of testing and a number of software releases, updates and derogations all requiring approval, software quality and assurance remains the continuing focus.



Key Programme Milestones

Stage 2	P80 Programme (V3_5_1) 11th Jan	Current Forecast
Approval for driver training on Great Western routes excluding European Train Control System	27 Feb	Completed
Commence build of TCMS release 7.3 (the Stage 2 passenger service software)	26 June	Completed
Independent Safety Assessment body ('ISA') approval for European Train Control System MR3 software necessary for Stage 2	6 Aug	Under review
Independent Safety Assessment body ('ISA') approval for TCMS release 7.3	18 Sept	Under review
Approval for European Train Control System driver training on Great Western	24 Aug	Under review
Approvals for European Train Control System Passenger Service	28 Sept	6 Feb 19
Stage 3		
Completion of Transition testing at Melton ready for Central Operating Section Dynamic Testing	29 Jan	Completed
Commence build of TCMS release 7.2 (the Stage 3 passenger service software)	24 April	Completed
Independent Safety Assessment body ('ISA') approval for European Train Control System MR2 software necessary for Stage 3	22 May	Completed
Approval of CBTC signalling for Central Operating Section Trial Operations	22 Jun	Completed
Availability of 22 trains for Trial Running in the Central Operating Section	13 Aug	Unit Acceptance Paused
Approval of Class 345 for Stage 3 Passenger Service	10 Oct	Under Review
Start of Stage 3 Passenger Service	9 Dec	Autumn 2019
Old Oak Common Depot		
Section A Brought into Use	1 Mar	Completed
Section B1 Brought into Use	11 Apr	Completed
Section C Brought into Use	30 May	Completed

