

## TRANSPORT FOR LONDON

### BRIEFING NOTE

**Subject:** Weekly Mayoral update on Crossrail / Elizabeth line

**Date:** 1 March 2018

#### Manifesto commitment(s)

Not applicable

#### Draft 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 Headlines

- 2.1 As planned, in the early hours of 26 February the first of the new Class 345 trains commenced its maiden journey into the new tunnels marking the start of dynamic testing. It travelled under 25kV power supply between Abbey Wood and Connaught Tunnel and has now travelled at 25mph. The detailed testing programme will continue this week and will be extended to Stepney Green.
- 2.2 Dynamic testing is initially being undertaken during engineering hours at night to demonstrate that the train and infrastructure do not impact the adjacent railway assets of Network Rail, London Underground and Docklands Light Railway.
- 2.3 Once this is proven, dynamic testing during the day will commence. The train is currently being operated manually by the driver but within a few weeks, and in line with the dynamic testing plan, it will come under signalling control from the line's Route Control Centre at Romford.
- 2.4 This is a major milestone for the project and has been a huge combined effort by the systems, infrastructure and rolling stock teams, along with MTR Crossrail who are providing the train drivers.



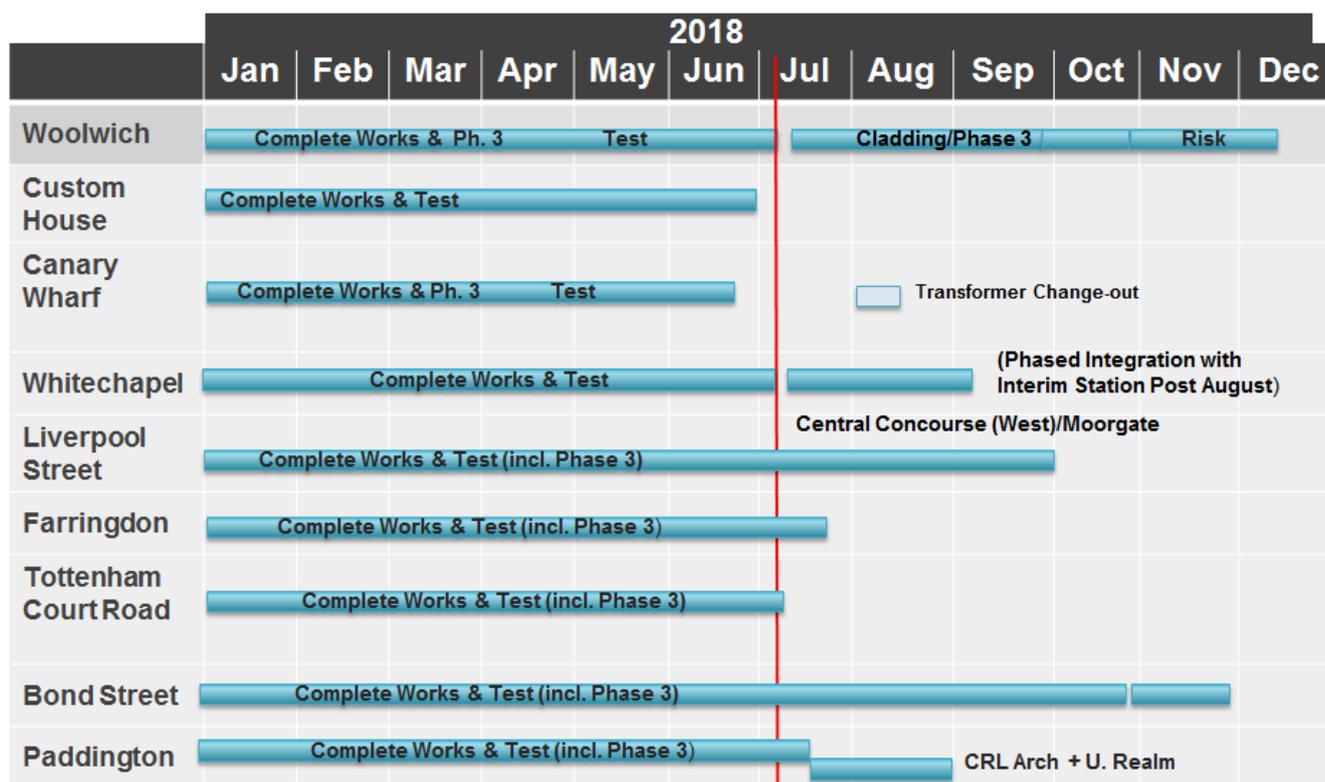
### 3 Costs

- 3.1 The cost position is formally calculated and communicated on a periodic (4-weekly) cycle and so is unchanged this week.
- 3.2 Discussions took place between CRL and Sponsors (DfT and TfL) at the Crossrail Sponsor Board on 22 February, regarding the likelihood of additional funding being required to complete the project. CRL's current forecast (3 February) continues to show £48m headroom to the limit of the £600m contingency, funded by TfL. Scenario analysis presented by CRL indicates that the likelihood of their cost forecast breaching that limit by the time of the next formal report (the Semi Annual Construction Report in May) is high.
- 3.3 A deep dive into Crossrail / Elizabeth line readiness with TfL Board members has been scheduled for 14 March where the implications of a potential breach will be reviewed.

### 4 Programme and Schedule

- 4.1 Key commitments and dates in Crossrail's Master Operational Handover Schedule (MOHS) 2018 are provided in the annex.
- 4.2 Over the last week the Final Design Overview (FDO) was completed for Tottenham Court Road. All other stations, portals, shafts and systemwide elements FDOs will be achieved later in March.
- 4.3 Achieving FDOs is an important step in preparing for handover of elements to the Infrastructure Maintainers during summer 2018. In addition, supervisory control and data acquisition (SCADA) connectivity was achieved between Westbourne Park and the Route Control Centre at Romford enabling control of systems from Romford.
- 4.4 The MOHS 2018 sets out the dates to complete the central section stations including key milestones for: Phase 3 integration testing; all fit-out, mechanical and electrical, lifts and escalators and testing & commissioning; handover to the infrastructure managers; and completion of the whole works.
- 4.5 The completion status around the timescales for handover, trial running, trial operations and Stage 3 commencement dates are set out in the diagram below (the red line is the nominal handover date of 5 July 2018. The dropdown line for Paddington from July to September represents the works to deliver the arch and urban realm which will not prevent us from opening the station).
- 4.6 Detailed handover execution plans for each of the stations are now being finalised in discussion with the infrastructure maintainers. A more detailed briefing on the status of the individual stations will be provided next week.





- 4.7 This week Bombardier is testing the newly released 7.1 Train Control Management Software at Melton as well as continuing tests of braking and stopping accuracy on the Class 345 trains. At Derby testing of the Driver Machine Interface DMI continued.
- 4.8 The first 9-Car train started testing on the Great Western Main Line between Paddington and Maidenhead (tweeted by TfL on Monday 19 February) and a second train began testing on 26 February. This is in line with the plan for introduction of trains on the Great Western route from May 2018.
- 4.9 A 9-Car train was tested in the Heathrow tunnel using European Train Control System (ETCS) signalling overnight on 23 February. The results were better than previous tests in January. There are many more stages to go through before any passenger service.
- 4.10 Train testing and approvals were completed in time for the start of testing in the Crossrail tunnels, which commenced on 25 February. The first trains are driven by staff and not in automatic operation.
- 4.11 Further approvals are being prepared by Bombardier for the start of testing of automatic operation in the tunnel from 25 March. It is vital the train is available to support this next stage of testing.
- 4.12 Bombardier's mobilisation continues for bringing Old Oak Common Depot into use, in stages, from 1 March. The depot is needed to support all stages of the Elizabeth line.



## 5 Industrial relations

- 5.1 Discussions between Unite the Union and Balfour Beatty have continued regarding second tier payments and completion bonuses, with regard to a dispute involving Balfour Beatty electricians working at Woolwich.
- 5.2 Unite has called four further strikes (7, 14, 21, 28 March) in order to maintain their mandate from the original strike ballot. Discussions will continue between Unite and Balfour Beatty.

## 6 Appendix

- **Appendix A:** Key milestones from MOHS 2018 and BT schedule
- **Appendix B:** Table of key risks and issues



## Appendix A: Key milestones from MOHS 2018 and BT schedule

| MOHS Milestones                                    | MOHS2018 date | Status    |
|--|---------------|-----------|
| Traction power Zones 1&2                           | Feb 18        | Achieved  |
| Dynamic testing Zones 1&2                          | Feb 18        | Achieved  |
| Traction power on Zones 3&4                        | May 18        | On target |
| High Voltage Non Traction Power Zones 1&2          | May 18        | On target |
| Stage 2 commencement (contingency plan)            | May 18        | On target |
| Dynamic testing Zones 3&4                          | Jun 18        | On target |
| Network Rail award west station contract           | Jun 18        | On target |
| Handover of stations and elements to RfL and LU    | Jun-Nov       | On target |
| High Voltage Non Traction Power All locations      | Jul 18        | On target |
| Dynamic testing all zones                          | Jul 18        | On target |
| Trial running commences                            | Aug 18        | On target |
| Safety case for central section submitted to RAB C | Aug 18        | On target |
| Trial operations commence                          | Sep 18        | On target |
| Submit Approval to Place Into Service to ORR       | Sep 18        | On target |
| Full Stage 2 services                              | Tbc           | tbc       |
| Stage 3 commencement                               | 9 December 18 | On target |



**BT Key Programme Milestones**

|  |   |                  |
|--|---|------------------|
| <b>Stage 2</b>   | P80 Programme (V3_5_1) 11 <sup>th</sup> Jan | Current Forecast |
| Approval for driver training on Great Western routes (excluding European Train Control System) | 27 Feb                                      | 5 March          |
| Approval for European Train Control System driver training on Great Western                    | 24 Aug                                      | TBC              |
| Approvals for European Train Control System Passenger Service                                  | 28 Sept                                     | TBC              |
| <b>Stage 3</b>   |   |                  |
| Completion of Transition testing at Melton ready for Central Operating Section Dynamic Testing | 29 Jan                                      | Complete         |
| Approval of CBTC for Central Operating Section Trial Operations                                | 22 Jun                                      | 22 Jun           |
| Availability of 22 trains for Trial Running in Central Operating Section                       | 13 Aug                                      | 13 Aug           |
| Approval of Class 345 for Stage 3 Passenger Service  | 10 Oct                                      | 10 Oct           |
| Start of Stage 3 Passenger Service   | 9 Dec                                       | 9 Dec            |
| <b>Old Oak Common Depot</b>  |   |                  |
| Section A Brought into Use   | 1 Mar                                       | 1 Mar            |
| Section B1 Brought into Use  | 11 Apr                                      | 11 Apr           |
| Section C Brought into Use   | 30 May                                      | 30 May           |



## Appendix B: Table of key risks and issues

| Risk / Issue  | Key date   | Mitigation / Action   |
|---|--|---|
| Stage 2   |  |   |
| Issues arising from integration of on-board European Train Control System (ETCS) with infrastructure and associated delays to Regulatory Approvals      | Initial ETCS integration testing started 12 Jan 2018                             | Revised BT programme was presented on 9 Jan 18. Weekly high- level dialogue with BT and dedicated CRL Stage 2 integration lead in place. Alternative (Class 360s) units secured - contract signed - to cover any delay. |
| Stage 3   |  |   |
| Timely provision of design assurance information, asset data, key operations/ maintenance information.  | Systemwide Handover 5 Aug 2018   | Design assurance slowed in the period so will receive further focus at close out meetings delivery of asset information including O&M requirements remains cause for concern. Escalation with Tier I contractors.       |
| Risk of delays to the Bombardier schedule for installation of the Class 345 on-board TCMS / CBTC (v 6.1.1 & v7) impacts activities for Dynamic Testing. | Train tested & delivered to central section 29 Jan 2018                          | CBTC Testing started at Old Dalby. Revised plans developed to continue testing to build contingency to start of testing in central section in February 2018.  |
| Risk of delays to commissioning of NR interfaces impacting trial running.   | Blockades Z1&2 3-24 Mar 2018<br>Z3&4 6-20 May 2018                               | Recovery plans under development for installation of contract C620 equipment on NR lines to Stratford   |
| Risk of insufficient time to undertake trial operations activity.   | Trial Ops 09 Sept 2018   | Complete infrastructure and testing as early as possible to allow unimpeded trial operations. Prepare station handover plans  |
| Risk of LU readiness being impacted by ongoing construction at stations, spares availability and completion of staff training.                          | Trial Ops 09 Sept 2018   | LU Readiness Board overseeing this activity.  |
| Preferred delivery option and programme for wifi and 4G for passengers from stage opening and maintenance teams from handover.                          | Wi-Fi available to maintainers 5 Aug 2018<br><br>Wi-Fi for passengers 9 Dec 2018 | Confirm programme and way forward.<br>Scope and confirm funding.  |

