Crossrail update: schedule

Mayoral meeting
26 July 2018
1. Current status
2. Schedule priorities
3. Programme options
   • Schedule deep-dive results
   • SQRA analysis and conclusions
   • Options for partial opening in December
4. Impacts on other stages
   • Stage 4 and 5
5. Decisions and next steps
The Stage 3 opening date in December 2018 is at high risk

This results from:

- A late start of dynamic testing following the voltage transformer failure in November 2017
- Challenges to completing fit-out, testing and commission of the routeway
- Rolling stock that is less tested and stable than planned for
- Insufficient testing time remaining and poorer productivity than planned in testing thus far

CRL has reviewed its delivery plan and the options available
Schedule priorities

1. Finish the routeway construction/static testing to enable “full” 5 days per week Dynamic Testing
2. Complete and deliver planned software updates (train and signalling)
3. Start 5/2 Dynamic Testing phase and optimise Dynamic Testing iterations (Siemens tests primarily) and bug-fix train/signalling software
4. Allow for a safety assurance period at the end of testing
5. Re-introduce trial running (reliably meeting capacity) and trial operations – building fleet and system reliability
6. Finish stations in most efficient way to the planned Staged Completion dates
Schedule – Key Considerations

<table>
<thead>
<tr>
<th>Activity</th>
<th>Range</th>
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<tbody>
<tr>
<td>1 Finish routeway installation</td>
<td>22 October through to November</td>
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<tr>
<td>2 Efficiency of testing / train reliability / re-test</td>
<td>Built in 20% re-testing</td>
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</table>
| 3 Number of software builds required to deal with bugs, transitions testing and reliability, appreciating the low number of tests successfully passed to date | Base of 4 “passes” of 20 working days (based on Siemens input) with likelihoods of completing all testing after each pass:  
  - 2 passes 10%  
  - 3 passes 50%  
  - 4 passes 85%  
  - 5 passes 100% |
### Dynamic Testing Critical Path

#### 2018

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<tr>
<th>Jan</th>
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**Finish Routeway Install**

**Static Test**

- **BT TCMS 7.2.1.3**
  - Siemens TG 3.0.10
  - GE Transitions
  - GW Transitions

**Risk**

**SCENARIO 1**

- **BT TCMS 7.2.2.2**
  - Siemens TG 3.1.0

**Dynamic Test 5/2**

- **Pass1 Pass2 Pass3 Pass4**
  - BT TCMS R7.2.2.2

**Risk**

- **Dynamic Test Days:**
  - 34 days (test windows)
  - 80 days (5/2 DT)
  - 114 days total

**SCENARIO 2**

- **Dynamic Test 5/2**
  - **Pass1 Pass2 Pass3 Pass4**
  - BT TCMS R7.2.2.2

**Risk**

- **Train fleet mileage**

**SCENARIO 3**

- **Dynamic Test 5/2**
  - **Pass1 Pass2 Pass3 Pass4**
  - BT TCMS R7.2.2.2

**Risk**

- **Opportunity for Further Transitions Testing**

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#### 2019

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<th>Jan</th>
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**Finish Routeway Installation and Testing**

- **SQRA Milestone**

**Complete and deliver planned software updates through until October**

**Start 5/2 DT phase and optimise durations**

**Build reliability through Trial Running and Trial Operations**

- **Train fleet mileage**

**Dynamic Test Days:**

- 34 days (test windows)
- 80 days (5/2 DT)
- **114 days total**

(Compared to 175 in MOHS 2015)

**Risk range for opening from May to August**
Options for opening in December

- 2 Options for partial or sectional opening in December have been analysed
- They are judged as not feasible

<table>
<thead>
<tr>
<th>Description</th>
<th>Blockers</th>
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</table>
| 1 Custom House to Abbey Wood – 5 days/week | 1. Testing and assurance (signalling) not completed  
  2. Train paths from Old Oak Common  
  3. Segregation of Control Centre to run operational railway as well as dynamic testing not feasible / safe  
  4. Will require completion of GSM-R system and integration with NR  
  5. Huge effort in creating a bespoke safety case  
  6. ORR will need to be convinced that this is a viable and safe railway  
  7. Distraction to full opening – will increase risk  
  8. Integration of this zone into whole route will be complex if running a service |
| 2 Paddington to Whitechapel | 1. Requires full delivery of zones 2,3,4 plus trial operations which is not possible by December  
  2. Requires zones 3 & 4, plus transitions testing to be complete – these are the latest activities in the schedule |
CRL fully appreciates the importance of delivering Stages 4 & 5 in 2019 for TfL’s business plan.

Work is being carried out to test the implications of a Stage 3 delay on options available for Stage 4 potential delivery September 2019 and Stage 5 December 2019.

Includes assumption that Stage 2 Phase 2 commences at end February 2019.

Criteria for assessment now established.

Proposal will be assessed early August and reviewed by CRL Board on 29 August.
## Decisions / Next steps

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
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<tbody>
<tr>
<td>1. Continue with dynamic testing windows to prepare / protect Transitions testing in August/September</td>
<td>In progress</td>
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<tr>
<td>2. Siemens and BT formally requested to mobilise for start of 5/2 Dynamic Testing in October</td>
<td>Complete</td>
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<tr>
<td>3. Brief Sponsor Board</td>
<td>26 July</td>
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<td>4. Communication to ORR to confirm renewal of ROGS exemption (and extend to end April 2019)</td>
<td>early August</td>
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<td>5. Complete options analysis for Stage 4 &amp; 5</td>
<td>early August</td>
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<td>6. Formal CRL Board decision</td>
<td>29 August</td>
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<td>7. Inform Network Rail (timetabling for Stages 4&amp;5)</td>
<td>September</td>
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<td>8. Sponsors formally advised of revised plan</td>
<td>20 September</td>
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<td>(bringing earlier)</td>
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In addition agree communications strategy with Sponsors