



RESPONSE TO THE CROSSRAIL SPONSORS ON THE PROJECT REPRESENTATIVE SPONSOR SUMMARY REPORT – PERIOD 10 REPORT

Date of Issue (this paper): 27 February 2020

Issued to: Simon Adams, Head of Crossrail Joint Sponsor Team - Transport for London

Author: Liam Hewitt, Head of Reporting – Crossrail. [REDACTED]

Approved by: Mark Wild, Chief Executive Officer – Crossrail

1. Purpose

- 1.1. The purpose of this paper is to provide the Crossrail Sponsors with Crossrail's response to the Project Representative's ("**PRep**") Sponsor Summary report. It has been produced in consultation with Crossrail subject matter experts. A list of consultees is attached as Appendix 1.
- 1.2. The report responded to in this paper is the Period 10 FY2019-20 (08 December 2019 – 04 January 2020) report, issued and received on 03 February 2020.
- 1.3. To ensure Crossrail's comments can be mapped accurately to the PRep's comments, each header (typed in **bold**) has the relevant PRep paragraph reference number in brackets. For this Period, Crossrail has annotated the PRep's report to include paragraph references. This annotated report is attached as Appendix 2.

2. Opening Statement from the Chief Executive Officer of Crossrail Ltd

- 2.1. We have seen an energetic start to 2020 across the programme. The year ahead is looking to be one of the busiest and most exciting so far on the project. There is a lot of work to do, but we have a strong action plan to get the clarity needed for this final push.
- 2.2. Over the next few weeks there will be an increased clarity of the essential works required for us to enter into Trial Running through the works and assurance documentation triage exercises. We've introduced strong governance from site to senior level through the establishment of Integrated Delivery Teams and senior steering groups; these will ensure an embedded and integrated approach continues to be taken.
- 2.3. While we rightly focus on getting to Trial Running and, subsequently, Trial Operations and Revenue Service, my main priority is keeping people safe during this transitional time. While technically after the period of focus for this report, it would be amiss to not mention the fantastic Health and Safety performance in Period 11. We had no High Potential Near Misses, Lost Time Cases or RIDDORs.
- 2.4. Fundamental to this safe and successful final push is the leadership of the organisation. I have appointed Jim Crawford as my Chief Programme Officer to take on overarching

responsibility for the end-to-end delivery of the Elizabeth line, while Mark Cooper will take on the role of Chief Projects Officer, having a narrower and relentless focus on the activities required to start Trial Running. This strong leadership will ensure we have the drive and determination required to safely deliver the Elizabeth line for Londoners and the UK.

3. PRep Key Areas of Concern in the Period

3.1. The PRep highlighted three key areas of concern for Period 10 (*References: 13.1, 13.2 and 13.3*). Crossrail's comments are provided below.

3.2.1 PRep Concern: "1. What are CRL's plans to develop a robust scope to complete each element of the programme?"

3.2.2 Crossrail Response:

An exercise is currently underway to accurately define all the 'work to go'. This exercise seeks to combine the Element Outstanding Works List (EOWL), and the various other works lists maintained at sites. The Elements and Routeway chapters are completing the exercise of uploading all items to the EOWL list (including snag items and observations from RfLi and CEG verifications) so the number is growing to reflect a more accurate perspective of 'works to go'. At the same time as uploading all known 'works to go' to the EOWL list, the site teams are also conducting the process of closing all known items (with the appropriate evidence) where the process has been followed through to completion. This will ensure that the EOWL number is an accurate representation of the actual 'works to go' and define the remaining scope of the programme.

A single list will be created at each site, and the list will be triaged into works required against the defined configurations for Trial Running, Handover, Trial Operations, and Revenue Service. This will enable the programme to understand the prioritisation of works at site which will underpin the programme and identify potential works post-ROGS and post-Revenue Service which could be completed by an alternative delivery method. Results from the triage by the sites is then being scrutinised centrally by RfLi, LUL and Crossrail technical teams to determine the validity of the assessment and to standardise principles across the programme. This work is forecast to be initially complete in mid-February, but the worklists will be dynamic and iterative.

Following on from the triaging of the physical works is the triaging of the required documentation (eg. Operation and Maintenance Manuals). The documentation scope is defined in the Element Completion Handover Report (ECHR), triaging this is a high priority.

A senior steering group has been established. It is Chaired by the Crossrail Head of Engineering, with Infrastructure Manager representation to oversee the 'works to go' reviews and triaging. In addition, the Crossrail Chief Engineer has been actioned to produce a set of guiding technical principles on priorities for Trial Running. These interventions are intended to ensure consistency of approach across all elements.

3.3.1 PRep Concern: "2. BT's software Y1.3 (authorisation by ORR for Stage 2B) has slipped from a forecast of ██████████ in Period 1 to its current forecast of ██████████; it has slipped from the ██████████ in the last period alone. What assurances can CRL provide to Sponsors that this slippage will not continue?"

3.3.2 Crossrail Response:

The BT programme was re-baselined in Period 02 to take account of the ETCS/ TCMS programme delays in the last quarter of 2018/19; the additional software development;

assurance work forecast in 2019 for Stage 5A reliability improvements; and the additional PD+10 CBTC in the COS. The Period 02 re-baselined dates for authorised trains to Stage 2B showed an [REDACTED] and a [REDACTED]. These dates were transposed in June 2019 into the DCS V1.0 with a Stage 2B Cardinal Milestone date 06 January. It therefore might be more equitable to report on slippage over the last 9 Periods, or against the DCS.

The critical path to first passenger service to Heathrow is through the BT AsBo and NoBo to complete the authorisation submission to ORR (Technical File), and the ORR review duration. The AsBo and NoBo complete their review and BT complete the Technical File for submission to the ORR week ending 08 February. TfL has assumed the ORR will take 4 weeks to review and issue an authorisation letter. In the interim, the Z1.2 software for passenger service will be released ready for loading to trains in advance of the anticipated ORR authorisation date of 06 March, and is not on the critical path.

3.4.1 PRep Concern: “3. The delivery teams have noted that some of the stations still appear to be working towards different interpretations of key milestones. What are CRL’s plans to simplify the milestone targets to support the Trial Running start date?”

3.4.2 Crossrail Response:

Crossrail issued a CEC (Chief Engineer’s Communication) to site teams on 24 January 2020. This outlined updates to the T-Minus stage gate process previously communicated in October 2019. This includes requirements to show certain milestones in the contractors’ Clause 32 programme and for project managers to develop specific action trackers for their Elements in line with the ECHR, SCR Evidence List and the T-Minus timeline.

4. Matters necessitating Crossrail comment

4.1. Crossrail has the following comments on the PRep report, in a repeated order to the PRep’s Sponsor Summary report.

HEALTH AND SAFETY PERFORMANCE (*Reference: 1.0*)

4.2. Crossrail, with the support of its supply chain, has created a ‘league table’ linked to HSPI scores and accident performance. This has been reviewed at the previous two SHELТ meetings, with each joint venture (JV) owning its performance. This is generating healthy competition and it is enhancing the opportunity for learning conversations amongst the JVs beyond the SHELТ meetings. The league is split to show the JVs that achieve a HSPI score above 2.7, with a penalty mechanism for having caused harm and hurting people (the accidents).

TRANSITION TO ROGS (*Reference: 2.0*)

4.3. To reduce duplication, Crossrail’s comments have been included in its response to the PRep’s Key Area of Concern 1 (*Reference 13.1*).

4.4. Additionally, as a point of clarification Crossrail would like to highlight the triaging exercise to determine the essential criteria for entering into Trial Running (both for EOWLs and the ECHR) has not been completed yet. Therefore, the statement by the PRep that the equivalent of 98% of EOWLs being required for Trial Running could be misleading and it is expected that this number will be much lower.

HIGH LEVEL SCHEDULE SUMMARY (*Reference: 3.0*)

4.5. A re-baseline of the programme will require clarity on the 'works to go' and the substantive completion of the EOWL triaging exercise, which is due to be initially complete in mid-February 2020 (see 3.1). Crossrail is concurrently undertaking a series of integrated DCS alignment workshops, outputs of which identify and agree mitigations to be included in a proposed update to the DCS and this is to be submitted to the Crossrail Board. There is also an exercise ongoing to complete the 'End to End' plan and to mature the Alternative Delivery Model approach. As the outputs of these activities are pre-requisites to a full re-baselining exercise, February 2020 will not be targeted. Crossrail will aim to align a re-baseline to the start of the next financial year (01 April 2020). In the interim a "soft" reporting baseline is being considered to provide visibility of programme performance to support entry into Trial Running.

CRL 3 LINES OF DEFENCE (*Reference: 4.0*)

4.6. For clarification, Crossrail do not view set-piece reviews as not possible. Set-piece assurance is viewed as having limited longevity in a highly dynamic context such as Crossrail. The more agile approach being proposed helps to respond to the immediate needs of the programme, increasing relevance and value for money.

4.7. Regarding Second Line of Defence (2LoD) progress:

- TAR 13 MEP Certification Discrepancies: Conducted on a sampling basis. Review drawn to a conclusion (resources required on TAR 14).
- TAR 14 CRAF02: Commenced 03 February 2020.

4.8. Regarding Third Line of Defence (3LoD) progress:

- IA 19 503 Project Cost Forecasting: issued 05 February 2020.
- IA 19 505 Workforce Planning: issued 20 December 2019.
- IA 19 509 Counter Fraud: in progress.
- IA 19 502 Health and Safety: terms of reference being developed by IA.

COST, COMMERCIAL & RISK (*Reference: 5.0*)

4.9. Extended AFC reviews on [REDACTED] were undertaken in January. The first risk deep dive is on schedule risk and will take place on 12 February.

4.10. Using the Period 04 AF CDC forecast in the DCS Board Paper at Period 04, COWD has since increased by [REDACTED] and CTG + Risk has reduced by [REDACTED], a difference of [REDACTED]. This difference is explained by the Period 7 update to the DCS which saw a [REDACTED] increase in overall AF CDC. Since period 7, COWD has increased by [REDACTED], with a corresponding decrease in CTG + Risk of [REDACTED].

Stage 2B (*Reference: 6.0*)

4.11. To reduce duplication, Crossrail's main comments have been included in its response to the PRep's Key Area of Concern 1 (*Reference 13.1*).

4.12. The application to ORR ('Technical File') has been delayed by 6 weeks in the last Period (P10) following meetings with the ORR in December 2019 where it was conformed

that BT should submit risk assessments (underwritten by an ASBo) for non-compliance against the ETCS TSI. This was not accounted for in BT's Technical File production plan and was a substantive additional activity for BT's specialist engineering team, and the ASBo.

STAGE 3 (*Reference: 7.0*)

- 4.13. During Period 10, there was slippage reported at some sites due to the programme-wide issues affecting all Elements / Chapters which have been reported in previous periods. These include TVS Opening Forces, Door Cross-Cutting issues, and D25 Noise issues.
- 4.14. The implementation of an integrated approach to remaining works and the creation of Integrated Delivery Teams (IDTs) at project level will ensure that the necessary skills, knowledge and decision-making authority is available at site level in every project to support the transition through the different phases of the staged completion configuration.
- 4.15. To maintain the Trial Running date, a list of programme level assumptions has been developed with associated mitigating actions, interventions and owners to drive the achievement of this date. These are reviewed during daily management calls with the Tier 1s and members of the Crossrail Delivery Team to ensure commitment of accountability, review progress and provide a forum for escalation and early warning. This list is also discussed at the Integrated Review Meetings (weekly) that are being introduced and the Programme Integration Review Meetings (periodically). The governance for the list is currently being formalised.

APPROVALS, ASSURANCE AND AGREEMENTS (*Reference: 8.0*)

- 4.16. The Trial Running System Description has the minimum essential requirements for stations as Custom House and Abbey Wood for early handover, and all other stations at SC1 Enacted Configuration Status.
- 4.17. Integrated DCS workshops were held during January to ensure alignment with the RfLI T-Minus schedule for SC ROGS.
- 4.18. A T-Minus schedule for Trial Running is being developed for reporting through the newly convened Trial Running Management Board (TRMB).

RAIL SYSTEMS & DYNAMIC TESTING (*Reference: 9.0*)

- 4.19. During Period 11, the time lost in testing due to unforeseen issues was 12%, which is trending positively against the overall average at 14% loss. The impact upon planned testing has reduced, with mitigation applied during the dynamic testing windows. A robust process is in place to investigate all issues experienced during testing, and track the associated actions. There is also a DT (dynamic testing) Improvements Forum, focused upon strategic initiatives.
- 4.20. Only 14% of C620 test cases performed but not passed are due to a failure of planning or execution. There are 137 C620 test cases required for Trial Running; 118 (86%) of the 137 test cases for Trial Running have been performed, with 87 (64%) fully passed. All test cases without a fully passed status either have a planned fix that will be tested by the 09 May or an agreed in principle operational restriction. Safety justification for Trial Running remains on plan with Siemens' submittal of their ESJ to Crossrail in March and BT consent to operate available in April. The safety justifications will detail conditions of use restrictions in two categories:

- Agreed restrictions based on non-required functionality for Trial Running, and
- Restrictions to be removed once test validation evidence is provided on completion of Dynamic Testing

4.21. In summary, dynamic testing is not seen as a significant risk for the commencement of Trial Running in [REDACTED]

RELIABILITY GROWTH (*Reference: 10.0*)

4.22. Train mileage is fundamental to the demonstration of performance, not only of the train and train control/signalling software but also other systems. This will be done through Operational Scenario Tests (OST) - managed by the Reliability Team and focussed on mileage. Some early single train OST has flushed out challenges with Platform Screen Doors that must be resolved.

4.23. Multi Train OST will start in with Y0.500 will start in early February and significant mileage is expected to build from May when access to the COS increases and Enhanced Dynamic Testing begins

STAGE 5B OPENING (*Reference: 11.0*)

4.24. No comment by the Project Representative provided.

STAGE 4 & STAGE 5 SUMMARY (*Reference: 12.0*)

4.25. No comment by the Project Representative provided.

END

APPENDIX 1 – LIST OF CONTRIBUTORS**RESPONSE TO THE CROSSRAIL SPONSORS ON THE PROJECT REPRESENTATIVE SPONSOR SUMMARY REPORT**

Period 10 FY2019-20 (08 December 2019 – 04 January 2020) report, issued and received on 03 February 2020.

Advisor to the CEO
Chief Executive Officer
Chief Finance Officer
Chief of Staff
Chief Projects Officer
Commercial Director
Communications Director
Contracts Commercial Manager
Cost Engineer (Project Delivery)
Crossrail Operations Business Manager
Deputy Programme Controls Director
Head of Assurance
Head of Engineering and Chief Information Security Officer
Head of Programme Delivery Strategy
Head of Project and Programme Assurance
Head of Risk
Head of Systems Integration
Health and Safety Director
Lead Reliability Engineer
Programme Controls Director
Programme Delivery Business Manager
Reporting and Governance Support Manager
Supply Chain Delivery Director
Testing & Commissioning Director
Testing & Commissioning Project Controls Lead

APPENDIX 2 – ANNOTATED PREP REPORT

RESPONSE TO THE CROSSRAIL SPONSORS ON THE PROJECT REPRESENTATIVE SPONSOR SUMMARY REPORT

Period 10 FY2019-20 (08 December 2019 – 04 January 2020) report, issued and received on 03 February 2020.