

RESPONSE TO THE CROSSTRAIL SPONSORS ON THE PROJECT REPRESENTATIVE SPONSOR SUMMARY REPORT – PERIOD 13 REPORT

Date of Issue (this paper): 28 May 2020

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

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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 13 FY2019-20 (1 March 2020 – 4 April 2020) report, issued and received on 1 May 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. As I write this, we are in the middle of Mental Health Awareness Week. It is a very challenging time in the outside world, and a challenging few months lay ahead as we push towards Trial Running and beyond.
- 2.2. Despite the challenges, we continue to deliver some significant milestones, and this is a product of all of our people's leadership and perseverance in these extraordinary times. All but one of the stations, Bond Street, has their Staged Completion 1 (SC1) configuration endorsed which is essential for entry into Trial Running. Custom House has been successfully 'virtually' handed over. All Engineering Safety Justifications (our contractors' assurance submissions) for the Routeway have been submitted. We continue to demonstrate good progress with Shafts and Portals, with North Woolwich Portal being 'virtually' handed over on 20 May 2020. Authorisation from the Office of Rail and Road has been received for running full length trains for Stage 2B between Paddington and Heathrow. I thank every single person helping to deliver the Elizabeth line and ensuring that we maintain momentum and continue to safely deliver the railway.
- 2.3. While further challenges lie ahead, the proof of what has been achieved in this environment gives me confidence in our ability to continue to safely deliver the railway.

3. PRep Key Areas of Concern in the Period (Reference: 17.0)

- 3.1. The PRep highlighted three key areas of concern for Period 13. Crossrail's comments are provided below.
- 3.2. PRep Concern (ref: 17.1): "How CRL can demonstrate that resources utilised in Safe Stop, will be measured and focused on the relevant assurance documents, supported by niche works, to positively impact handover and Trial Running?"
- 3.3. Crossrail Response: The Chief Engineers Group (CEG) is represented within Crossrail's COVID-19 Response Structure. Particularly, it is represented in the Silver Response Team that reviews all niche works submitted for approval. The purpose of the CEG representative is to ensure that priority is given to niche works that enable completion of the relevant assurance documents that positively impact handover and Trial Running. This is also described in CEC723 COVID 19 - Management Process for Niche Working.
- 3.4. PRep Concern (ref: 17.2): "CRL has previously found it difficult to implement adequate durations in its scheduling, how will CRL give assurance that a realistic Recovery Plan will be developed and underpinned by robust scenario plans, a costed QSRA, a fully defined scope of works to complete and achievable durations?"
- 3.5. Crossrail Response: Crossrail has an established and integrated Gold Response Team structure supported by four Silver Teams. One of the Silver Teams is the Recovery Team, comprising of multi-disciplinary representation and tasked with the development of scenarios for the recovery of the Crossrail programme. The scenario planning exercises have been undertaken with in an integrated manner across the programme, including the Delivery, Technical, Operations, Programme Controls, Risk, and Finance functions. The exercises undertaken have been shared with the Crossrail Board throughout their development.
- 3.6. These scenarios will be presented to the meeting of the Crossrail Board on 28 May 2020.
- 3.7. PRep Concern (ref: 17.3): "How CRL will mitigate emerging concerns on programme wide issue of Cyber Security?"
- 3.8. Crossrail Response: Weekly cyber security meetings have been set up between Crossrail and Rail for London (RfL) as part of a 'one team' approach to cyber security, and all assurance requirements have been communicated across the programme. Where required, additional resources have been drafted to further enhance efficiency across Crossrail's Cyber Security team. Working relations have been established with supplier engagement and procurement teams to launch a support network for the Tier 1s and to coordinate the cyber security assurance evidence with all contractors and necessary framework on each element.

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.

CORONAVIRUS (COVID-19) (Reference: 1.0)

- 4.2. The Project Representative's comments on the timeline of Crossrail's response to COVID-19 are broadly correct. On 24 March, at a meeting of Crossrail's Gold Response Team the decision was taken to enact the 'Safe Stop' in two phases; Phase 1 being the immediate

cessation of all activities except those deemed essential in order to maintain the security and safety of the sites, and Phase 2 being the more complicated protection of the temporary and permanent systems. Phase 1 was achieved on 25 March 2020, and Phase 2 was achieved fully on 7 April 2020.

- 4.3. Concurrently to undertaking the 'Safe Stop', Crossrail coordinated with Transport for London's Major Projects Directorate (MPD) to determine what works could be safely executed under Public Health England guidelines alongside the enabling processes, with these works being called 'niche works'.
- 4.4. On 7 April 2020, Crossrail secured approval for its Niche Works proposal. Niche works commenced on 20 April 2020.
- 4.5. The niche working environment is still live on Crossrail, and it has seen an incremental increase of resources on site undertaking niche works from 27 on 'Day One' to 367 on 13 May 2020.
- 4.6. From a resource perspective, Crossrail monitors daily the number of people on site required to maintain the 'Safe Stop' status, and the number undertaking niche works. While the numbers vary on a day-to-day basis as a result of maintenance regime requirements and the niche working programme, on 13 May 2020, a total of 491 individuals were affecting the 'Safe Stop' on site and 367 individuals were undertaking niche works.
- 4.7. Crossrail is working internally and with its Sponsors to best protect its supply chain, including those critical resources required for Dynamic Testing.

HEALTH AND SAFETY (H&S) PERFORMANCE (Reference: 2.0)

- 4.8. The High Potential Near Miss (HPNM) was a third part incident - a 'Category A' Signal Passed at Danger on Network Rail controlled infrastructure which Crossrail captured to ensure follow up and support to the investigation leaders, MTR /Network Rail. The loss of hours worked in Period 13 equated to 17%, and all Health and Safety Performance Index (HSPI) metrics were completed as usual and returned from the Tier 1 contractors.

SUPPLY CHAIN, SCENARIO PLANNING, RECOVERY PLAN (Reference: 3.0)

- 4.9. Crossrail are in negotiation with 13 of its suppliers to implement agreements to secure and retain key resources to support critical works. These agreements will create a "bench" of staff from each supplier which can be utilised by the Tier 1 contractors through their existing subcontracts.

[REDACTED]

- 4.10. The recovery programme has been under development for four weeks following the initial scenario planning carried out. A series of detailed planning workshops were held with all key stakeholders and projects delivery teams to support this exercise. The broad principles for this have been shared with Crossrail's executive to identify the optimum plan to restart the programme taking into consideration the constraints around ongoing COVID-19 restrictions. The strategy proposed allows for completion of Dynamic Testing and assumes a construction blockade to support essential works which will support future operation of Crossrail infrastructure and the completion of essential works which in turn will facilitate the completion of associated documentation, certification and assurance processes.

4.11.Detailed planning continues and is subject to critical reviews to agree the final end-to-end timelines which will identify robust dates for the completion of testing, Trial Running [REDACTED] and subsequently Trial Operations and Revenue Service. This work continues with a view to finalise this plan and present to Crossrail's executive and subsequently support an executive paper.

ASSURANCE MOUNTAIN (Reference: 4.0)

- 4.12. Focus has been placed on assurance documentation under the remote working conditions that prevail. This has fed into the Crossrail Resource Hub approach to identify potential spare capacity to undertake any remote working tasks that can support moving the assurance evidence forward.
- 4.13. Priority has been assigned to align niche works in conjunction with assurance documentation alluded to in 4.10. This includes priority for inspection and test activities at the shafts and portals to facilitate early handover of these elements; with Royal Oak Portal achieving early handover and plans for North Woolwich Portal to follow. Fisher Street and Limmo Shafts are expected to achieve handover in the coming weeks.
- 4.14. Additionally, focus has been on the stations reaching Stage Completion 1 (SC1) status. This has now been achieved at Paddington, Tottenham Court Road, Farringdon, Liverpool Street, Whitechapel, Canary Wharf and Woolwich stations. This leaves only Bond Street station to achieve equivalent readiness state with Custom House having achieved early handover and Abbey Wood already in use by NR.
- 4.15. Assurance dependency lists are being produced for the above elements to further check alignment with the proposed Niche works.

TRANSITION TO ROGS Readiness Capability (Reference: 5.0)

- 4.16. Operational Infrastructure Managers (IMs) readiness programme has been established with nine key areas of focus based on a gap analysis. The readiness programme (milestones and outputs) has also been aligned with the emerging COVID-19 recovery plan and will continue to align so that Trial Running readiness is aligned. Each of the nine workstreams now has ownership. This includes two of the workstreams that cover Crossrail readiness.
- 4.17. Trial Running Mobilisation Board is being restructured over a period of four weeks to concentrate focus on three areas: Infrastructure readiness, IM readiness and Crossrail readiness, with metrics that underpin and evidence that readiness and allow focus on positivity and areas of concern. Restructure and the metrics are targeted for completion by end May. A series of deep dives have been undertaken at Stepney Green and within the Energy Chapter to check any validity to the 'Handover Lite' approach and the benefit this would bring, both to delivery teams and to those reviewing/assuring/approving. This will be finally concluded for inclusion in the DCS2.0 along with revised handover dates.

INTEGRATED DELIVERY TEAMS (IDTs), ELEMENTARY OUTSTANDING WORKS LISTS (EOWLs), ALTERNATIVE DELIVERY MODEL (ADM) (Reference: 6.0)

- 4.18. In Period 13, the IDTs made progress against assurance deliverables and in executing niche working which has enabled progress to be made against the programme during COVID-19 restrictions. During this period, progress has been made in energising Stepney Green disconnectors and the completion of harmonics testing at Woolwich station. Dynamic Testing

is scheduled to commence on 17 May 2020. Progress has been made to secure the relevant resources for Tier 2 and Tier 3 suppliers to encourage niche works to continue. IDTs will ensure supplier details are sufficient to support their area of work so contracts can be firmed up and sponsorship obtained.

- 4.19. In Period 12, the Elementary Completion Handover Report (ECHR) Triage process and the EOWLs underwent its second iteration. In Period 13, further triaging has taken place, particularly at stations. New EOWL change control process has been established and is being trialled. Enterprise Bridge, Crossrail's document management system, has been reconfigured so that new EOWLs no longer default to Trial Running. This has been implemented to promote proactive triaging.
- 4.20. The ADM team is not undertaking a further triage of the EOWL list as this was explicitly stated as not part of the ADM remit at the Crossrail Executive meeting on 3 March 2020. Triaging of the EOWL list and further additions as they arise is an IDT accountability and responsibility.
- 4.21. Scope Allocation Surgeries run weekly with scope being brought forward by the IDTs in line with the latest guidance. Scope has been approved for transfer to the ADM and will be formally removed from IDTs via Change Control in preparation for transfer to the Transport for London (TfL) teams to deliver. Both TfL and Crossrail have a project manager in place to manage this transfer of work.

HIGH LEVEL SCHEDULE SUMMARY (Reference: 7.0)

- 4.22. The Project Representative's articulation of milestone movement and causation corresponds to that which Crossrail communicated in its Board Report. It is worth noting that the Period 13 schedule position generally excluded COVID-19 related delays with only actualised COVID-19 schedule impacts included. This has enabled the organisation to establish an accurate status benchmark at the point of effecting the 'Safe Stop' of works, and to allow as-best-as-possible a point of introspection regarding performance had COVID-19 not have occurred.
- 4.23. The scenario workstreams that have been developed by the Silver Response Team for Recovery (part of the organisation's Gold-Silver emergency response structure for COVID-19) will be presented to the meeting of the Crossrail Board on 28 May 2020.

CRL 3 LINES OF DEFENCE (Reference: 8.0)

- 4.24. Crossrail notes the Project Representative's comments.

COST, COMMERCIAL AND RISK (Reference: 9.0)

- 4.25. The Quantified Schedule Risk Analysis (QSRA) was updated for Period 13 and included in AFCDC. Note that Period 13 QSRA is based on the mitigated schedule, not the unmitigated schedule as noted here.
- 4.26. A significant update to the schedule is already underway and it is anticipated that DCS 2.0 will form the basis of an integrated forecast of schedule, cost and risk. DCS 2.0 is anticipated to be reported on in Period 3.
- 4.27. Period 1 reporting process will record the impacts of productivity loss related to COVID-19 on Anticipated Cost of Work Performed (ACWP) and Anticipated Forecast Cost (AFC).
- 4.28. Planning for recovery under a range of scenarios is now underway, although the UK strategy for easing lockdown and the policy regarding ongoing restrictions remains uncertain.

4.29.P13 QSRA was based on mitigated schedule with a Trial Running start [REDACTED]. Additional mitigations were agreed subsequent to the QSRA calculation that recovered Trial Running [REDACTED]. The days of delay generated by the QSRA, and associated cost quantifications, were applied to [REDACTED]. We believe the schedule prolongation risk is materially reasonable.

4.30.It is correct that Cost To Go (CTG) and risk have decreased by [REDACTED] this period yet [REDACTED] was spent. This [REDACTED] difference is the amount that the AFCDC has increased by.

STAGE 2B OPERATIONAL READINESS (Reference: 10.0)

4.31.The Crossrail notes the Project Representative's comments

STAGE 3 (Reference: 11.0)

4.32.Crossrail has recently completed a LOD1 assurance review of the Delivery Control Schedule (DCS) which has shown both examples of good practice and opportunities for strengthening. These include (i) developing Dynamic Testing Interface Guidance on what should be included in DCS; (ii) introducing standardisation around activity trackers to monitor progress for projects which can be more easily reconciled with DCS; (iii) targeted improvements to schedule quality at Bond Street, Farringdon, Liverpool Street and Whitechapel stations; (iv) developing a productivity benchmarking tool to assist with updating the DCS and underpinning activity trackers, and (v) improving alignment of milestones across all stakeholders (Delivery, Technical and Rail for London). While implementation timescales have yet to be confirmed, these improvement activities are intended to address confidence around period on period slippages.

4.33.Crossrail is also currently working to reset its DCS for Board approval by the end of June. The resulting "DCS2.0" will consider the impact of COVID-19 on delivery activity up to Trial Running including (i) the planning and delivery of niche works, (ii) implications of social distancing, and (iii) agreed Silver Team recovery scenarios. This will also consider historic productivity levels for selected activities along the critical path (e.g. production rates and review duration of key documentation). In the production of the DCS2.0, there is likely to be a higher level of certainty around activities up to Trial Running. For activities and milestones thereafter, it is anticipated the DCS2.0 will be presented with calculated ranges, conditional on a set of defined variables which cannot be forecast with certainty at this time.

4.34.The Project Representative also acknowledged the creation of Tiger Teams to address specific issues. Crossrail has now completed Tiger Team reviews for all Shafts and Portals. These reviews have informed the agreed "Handover Dates" (defined in Period 13) for all outstanding shafts and portals which are recognised by all stakeholders (Delivery, Technical and RFL). "Sprint Plans" are currently being developed for each of the remaining shaft and portal to accurately plot day-by-day plans required to implement mitigations required to maintain the agreed handover dates.

4.35.Cyber Security and other Technical risks critical to the programme, are being managed and reported by the Technical Director at an Executive level. This is to maintain awareness and visibility and driving to actions to mitigate any adverse impact to the Programme.

4.36.The Project Representative acknowledged the introduction of a "Handover Lite" process. It should be noted that Handover Lite will only be used as fall-back option for each site. Each site is actively planning to deliver full Handover. However, if this is not achievable due to

unforeseen circumstances, projects will be able to apply the Handover Lite process to preserve critical programme milestones. The Chief Programme Officer and Chief Operating Officer will then review each on a case-by-case basis to determine whether Handover Lite is appropriate. To ensure projects are prepared to enact Handover Lite if needed, teams have been instructed to prioritise all documentation required for Handover Lite before completing the wider suite of documentation required for full Handover.

APPROVALS, ASSURANCE AND AGREEMENTS (Reference: 12.0)

- 4.37. Review of the handover evidence needed for the shafts and portals is complete. This has identified the essential assurance documentation to be completed to support the early handover activity, leading to the concept of a Handover Lite, where further assurance documentation is to be completed by Stage Completion ROGS (SCROGS) prior to Trial Running.
- 4.38. Crossrail and RFLI agreement need to be established regarding the EOWL items as part of the early handover activities on a per Element (Shaft or Portal) basis.
- 4.39. The Railway System Chapters under the Routeway Element had already been reviewed for those that would only reach a staged completion status for Trial Running. The readiness status will be agreed between Crossrail and RFLI as part of gaining SCROGS ready per each railway system chapter, prior to the SCROGS milestone.
- 4.40. Any Handover Lite deferred assurance documentation is expected to be completed prior to the SCROGS milestone, to support RFLI becoming the IMs for the Central Operating Section Operational Railway. Hence this situation is not expected to increase what requires to be carried out during Trial Running.

RAIL SYSTEMS & DYNAMIC TESTING (Reference: 13.0)

- 4.41. Up to the time of 'Safe Stop' the Crossrail Mega Plan 2 provided the basis for planning and tracking progress of the completion of SSPs and Routeway Delivery, Dynamic Testing and the concurrent Maintenance and Reliability workstreams. Given that the Plan is largely built around the Signalling/Rolling Stock software development process, it is likely that the basic schedule structure for completion up to Trial Running will remain largely unchanged. However, it is anticipated that a revised integrated schedule will be required once there is more certainty around a return to work post Covid-19.
- 4.42. At the time of writing, niche works have commenced in some stations and on Routeway while observing strict compliance with social distancing guidelines. In particular, the outstanding works involving Stepney Green disconnectors have been completed to enable re-energisation of the traction power on 9 May 2020. The two trains that have been in the Routeway since the start of the lockdown will be recovered under their own power and replaced with two different trains by 11 May 2020 ready to re-commence Dynamic Testing on 18 May 2020. Dynamic Testing will only take place under strict compliance with social distancing guidelines as dictated by Safety Statement SS066 which has been approved by Dynamic Testing Safety Review Panel.
- 4.43. The resumption of Dynamic Testing will be a slow ramp up starting with a single train on a single shift per day in the first instance, moving to two trains in two shifts per day in early June 2020. Additionally, several scenarios are being worked to re-plan the completion of all construction and Dynamic Testing scope and complete the assurance to enable start of Trial

Running. This is likely to incorporate a shift to a more mature software configuration (e.g. CBTC TR2).

TRIAL RUNNING, RELIABILITY GROWTH (Reference: 14.0)

4.44.The review of software strategy for Trial Running is ongoing and continues to push for a software configuration that will provide more functions and better reliability than the 'candidate' software of Y0.510. It is true that Y0.603 would be a significant improvement and the Reliability team continues to work with the Plateau team to determine if this is possible.

4.45.The Reliability team is participating in the planning process to determine how to secure reliability mileage given the priorities to complete construction and dynamic testing. Mileage from FLU operations on the Great Western Main Line will help provide some insight although this is in a different environment and the Rolling Stock is on a different software configuration.

STAGE 4 SUMMARY (Reference: 15.0)

4.46.Crossrail notes the comments presented in the Project Representative's report

STAGE 5B OPENING (Reference: 16.0)

4.47.Crossrail notes the comments presented in the Project Representative's report

END

APPENDIX 1 – LIST OF CONTRIBUTORS

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

Period 13 FY2019-20 (01 March 2020 – 04 April 2020) report, issued and received on 01 May 2020.

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 Programme Delivery Strategy
Head of Project and Programme Assurance
Head of Risk
Head of Systems Integration
Health and Safety Director
Lead Reliability Engineer
Operations Business Manager
Programme Controls Director
Programme Delivery Business Manager
Reporting and Governance Support Manager

APPENDIX 2 – ANNOTATED PREP REPORT

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

Period 13 FY2019-20 (01 March 2020 – 04 April 2020) report, issued and received on 01 May 2020.