

RESPONSE TO THE CROSSRAIL SPONSORS ON THE PROJECT REPRESENTATIVE SPONSOR SUMMARY REPORT – PERIOD 3 REPORT

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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 3 FY2020-21 (31 May 2020 – 27 June 2020) report, issued and received on 24 July 2020.

2. Delivery Control Schedule (DCS) 1.1 – Schedule and Cost

- 2.1. The Crossrail team has been working intensively to develop a robust and detailed recovery strategy which addresses all the outstanding challenges faced by the programme. This has put pressure on some reporting lead times that Crossrail had previously established. At all times, the Project Representative has been kept informed and updated with access to key meetings and visibility of emerging detail wherever possible.
- 2.2. The Period 2 Anticipated Forecast Crossrail Direct Cost (AFCDC) estimate was draft and emerging, and represented a point on a range rather than a substantiated forecast AFCDC. At Period 3, a [REDACTED] was presented to Crossrail Board informed by updated [REDACTED] cost estimates. Crossrail agrees that Sponsors should consider the full range of reported outcomes in their decision making.
- 2.3. At Period 3, the DCS was revised to incorporate the Stations Recovery Plan, including stations handover configurations that factored in concurrency impacts and interaction with the critical C660 Communication and Control Systems works. The Stations Recovery Plan was not developed in time to be reflected in individual projects' schedule and cost forecasts. In consideration of this and other material uncertainties, Crossrail was not able to provide a substantiated AFCDC. In July, the Crossrail Board was presented with [REDACTED] [REDACTED] in support of the Recovery Plan. Work continues to refine and validate the remaining work schedule and associated costs with an update set for the August Crossrail Board.
- 2.4. Further and in explicit reference to the Project Representative's comments on the maturity of the schedule, the DCS1.1 is to be submitted to the August Crossrail Board. This follows agreement at the July Crossrail Board that the DCS1.1 should be further developed to mature the scope and schedule for the Stations aspects, in addition to assurance and post-Trial Running.

3. Blockade

- 3.1. The Blockade Peer Review process has iterated through T-2, T-1.5 and T-1 (week) reviews to confirm the scope, schedule, resources and logistics are in place for commencement of the blockade. In line with the Project Representative's view regarding contingency, Crossrail has incorporated an additional five days to the end of the blockade with a contingency blockade planned in January 2021 should any of the Trial Running scope not be completed in the August blockade that requires significant access.
- 3.2. The Project Representative raises a Key Concern regarding the specific metrics Crossrail will use to monitor and define the success of the blockade. The blockade success criteria was determined at the T-1 review and confirms that success will be measured through the completion of construction activities/work items, the completion of trace-affecting Elemental Outstanding Works Lists (EOWLs) required for Trial Running, sign off of the relevant Acceptance Certificates, the completion of Verification Activity Plans and related activities, and the completion of defined system wide integration tests.

4. Assurance

- 4.1. The Structured Engineering Judgement process has been adopted in order to maintain the DCS dates; further, the DCS1.1 will contain four weeks schedule float at the end of the Routeway assurance programme to ROGS to account for any delay to the sign off of the ROGS assurance.
- 4.2. The blockade scope has been clearly linked to the Hazards that are closed out and the Acceptance Certificates that are completed. Engineering reviews will continue to check for critical-resource bottlenecks and duplication of processes to remove non-value adding activities and smooth the resource profiles.
- 4.3. With the work carried out to remove concurrency in the schedule, the London Underground (LU) early transfer initiative has been suspended. This has freed up resource to focus on the completion of the assurance documentation for Shafts and Portals which remains a focus of the programme. Further, with the Trial Running [REDACTED] now moving out [REDACTED], the schedule criticality of achieving the Shaft and Portal handover dates has reduced. Significant effort has been applied to improving productivity rates for Operation & Maintenance (O&M) manuals, Health & Safety files, and As-Built Drawings, with a review underway into Asset Data. For O&Ms specifically, this effort has translated into much improved productivity.
- 4.4. The Project Representative raises a Key Concern regarding plans to mitigate Routeway's Safety Assurance as a critical path activity. The Routeway Safety Assurance programme has been augmented in the DCS 1.1 by the addition of a four-week schedule buffer to allow for slippage or the impact of any other assurance risks. In addition, and as mentioned previously, the Structured Engineering Judgement process has been adopted and resource levelling for RAB-C submissions has been undertaken. This will form part of the submission of the DCS1.1 to the August Crossrail Board.

5. Post-Trial Running Programme

- 5.1. The Stations concurrency and inter-relation with the C660 Communication and Control Systems contract work scope, testing and commissioning is under review and will be resolved in the submission to the August Crossrail Board. So far, the station concurrency has been resolved so that no LU station handover commences before the previous LU station has

completed its T-12 process. The Rail for London (RfL) stations have been positioned at six-week intervals to the LU stations. By doing this, the critical engineering resource required to complete the assurance process, and the C660 resource required to commission the C660 works at each station will have been smoothed to below the critical resource level.

- 5.2. Regarding the Project Representative's specific comments on the plan for Bond Street station, following the separation from CSJV, Crossrail is reviewing its strategy for completion of Bond Street. As a result, Bond Street will not be completed at the time of Stage 3 services and will be targeted to complete its Staged Completion 2 by the Trial Operations start date. In the short term, the contracting strategy, Tier 2 engagement and scope definition to complete will be confirmed to understand and confirm the completion schedule.
- 5.3. The Project Representative noted a Key Concern regarding how Crossrail will ensure physical works in Trial Running are minimised to de-risk the start of Trial Operations. The blockade work scope has been defined to maximise the completion of trace-affecting Trial Running critical works for Routeway and Stations. Following the blockade, there are several opportunities for any trace affecting works to be completed. All non-trace affecting works can continue during Trial Running. As a result of the blockade scope reviews, it is now clear what trace affecting scope cannot be completed in the blockade and this is being planned into the available access windows. To augment the existing access windows, consideration is being given to carry out a short one week period of construction in order to complete Bond Street Platform End Wall, the remaining hop ups, the Old Coal Yard buffer stop works and any scope not able to be completed in the blockade. If utilised, this will be timed between the testing of the TR2 software and the start of Systems Integration Dynamic Testing (SIDT) at the end of [REDACTED]. Further, there will be the opportunity to utilise the contingency blockade in [REDACTED] (as a result of T-4 blockade mitigation action). There are already intervention points within the SIDT and Trial Running period where several three-day Signal Protection Zone opportunities held for software point release updates can be used to complete the construction works. In SIDT, the plan is to run trains for five days a week with the opportunity to use the weekends to complete any essential scope or to run trains if no works are required to be completed. Finally, there is the opportunity to use the overnight eight-hour maintenance window to complete any other short duration packages of work or tests/inspections.

6. Trial Running and Reliability Growth

- 6.1. Although Y0540 will provide the assured baseline for train control software, the expectation is that Trial Running will start with Y0603 which includes TR2, and Plateau is working to try to include Point Release 5 within this (PR5). PR5 will remove several operational restrictions. If the start of Trial Running slips further, then there is potential to start with Y0610 which is more mature and includes TCMS 7.6.2.
- 6.2. The reliability growth has been modelled and is based on successful Testing and Commissioning of TR2/TCMS7.6 prior to SIDT in late [REDACTED]. SIDT will also provide useful insight into early system reliability and feed some of the later Trial Running software drops.
- 6.3. SIDT will provide significant benefit ahead of Trial Running, stressing the system and testing its integrated operation. This is key learning for reliability and will continue until Trial Running commences. Further insight on rolling stock will be gained from Full Length Unit mileage on the Great Western Main Line (GWML) and Great Eastern Main Line (GEML) as train control

software is converged with that in the Central Operating Section (expected from October 2020), providing comparable insight on performance. Metrics to track this have been introduced and the reliability team is working with Bombardier Transportation to converge performance metrics between the Central Operating Section and the operations on the GWML and GEML.

- 6.4. This has been picked up and will be tracked and managed through a new dedicated Stage 4a Steering Group under the governance of the End-to-End Board. The first will be held in August 2020, chaired by the Trial Running Mobilisation Board Chair to ensure consistency with the overall lead up to Trial Running. RfL, Network Rail and Mass Transit Railway will be represented at the Stage 4a Steering Group, and it will support key decision points in late summer (post blockade), [REDACTED] (Timetable bid point) and [REDACTED] (go-no/go for Central Operating Section availability [REDACTED]).

7. Resources and Organisation

- 7.1. The workforce plan and identification of critical resources and talent to be retained has now been completed. Specific discussions are underway to deliver the changes required to ensure that critical resources are retained and where identified, resource constraints are addressed.
- 7.2. This workforce plan will enable Crossrail to move away from specific end dates and align individuals and roles to phases of the DCS for which they are required. This work is underway, and it is intended that this becomes the BAU process to ensure critical resources and talent are maintained at the levels required to deliver the DCS. Crossrail recognises that constant focus is required to achieve this.
- 7.3. To specifically address the Project Representative's Key Concern regarding the accountability for critical resource management, the Chief People Officer and the Technical Director are accountable, with coordination and facilitation by the Organisation, Transition and Delivery Manager.
- 7.4. Regarding Tier 2 and Tier 3 critical resources, these will be extended as required to complete the remaining scope of the construction works and to close out any EOWs that arise from the remaining VAPs and tests.

END

APPENDIX 1 – LIST OF CONTRIBUTORS

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Period 3 FY2020-21 (31 May 2020 – 27 June 2020) report, issued and received on 24 July 2020.

Chief Finance Officer
Chief of Staff
Chief People Officer
Chief Programme Officer
Communications Director
Crossrail Operations Business Manager
Deputy Programme Controls Director
Head of Finance
Head of Risk
Lead Reliability Engineer
Operations Business Manager
Programme Integration Director
Reporting and Governance Support Manager