



Crossrail Limited
5 Endeavour Square
London E20 1JN
T: 0343 222 0000
Helpdesk
T: 0345 602 3813
www.crossrail.co.uk

██████████
Project Representative
Jacobs

18 August 2021

Dear ██████████,

Re: Crossrail PRep Project Status Report 152 – Period 3

I am writing in response to the Period 3 PRep Sponsor Summary cover letter.

CEO Statement:

The Crossrail Programme is now well into the Trial Running phase. We continue to push towards the deterministic leading edge of our Programme as this resolves integration issues early and is the quickest route to the opening of the Elizabeth Line. Of course, we continue to assess our risk profile and the risk adjusted opening window of the first half of 2022 remains valid.

We note the Project Representative's observations and there is nothing that the management team are not already aware of and actively intervening in. By targeting the earliest possible opening in a high interconnected and complex final integration risks will inevitably crystallise, I would note however that the Programme has delivered largely to the Deterministic schedule or within the P50 risk allowance since the start of the COVID-19 pandemic in March 2020.

Period 3 PRep Sponsor Summary cover letter response:

As noted in your letter dated 23 July 2021, the June/July 2021 Blockade was completed on time having met its core objectives. This achievement significantly reduced the number of trace-dependent works which is an integral factor in alleviating the access challenges encountered across the Programme since CRL's transition to a ROGS environment. The Blockade accomplished 95% productivity without any significant health and safety incidents which is a testament to the collaborative and coordinated effort between CRL Delivery teams and our RFLI colleagues. The capture of Blockade evidence into enterprise Bridge (eB), CRL's documentation management system, for dependency closure is ongoing and remains a priority for assurance completion. A plan is being defined to re-programme any outstanding Blockade works to the Element Outstanding Works List burn down process.

The Delivery Control Schedule (DCS) 1.2 exercise progresses, with the previous DCS1.1 having been updated to the DCS1.1J6 (incorporating the J6 Trial Running plan), and the DCS1.1J6 being updated with the revised post-Stage 3 delivery plan. This DCS1.2 schedule enhancement has been presented to the August Elizabeth Line Delivery Group (ELDG).

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Delivering on or close to this deterministic schedule as safely as possible remains our overriding goal and remains the single biggest financial opportunity. Therefore, it is important to note that while the incorporation of the J6 Staging Access Plan into the DCS1.1 rephased several key milestones as stated by the Project Representative, the revised Deterministic forecast date for the commencement of Stage 3 Revenue Service, February 2022, remains within the first half of 2022 which is the window CRL announced in 2020 for Stage 3 Revenue Service. The updated post-Stage 3 elements comprise of the replacement of Stage 4 and 5B with new Stage 5A and Parts 1 and 2, Stage 5B and Stage 5C, Bond Street station Bringing-into-Use, and the execution of residual works for post-Stage 3 Revenue Services.

With that said, CRL acknowledges the Project Representative's concern regarding emerging cost pressures across the Programme as a result of challenged schedules and uninstructed scope and the anticipated impact this may have on AFCDC. Therefore, CRL has taken a holistic approach by reviewing all project activities to determine what is critical for the delivery of a safe and reliable railway to the Deterministic schedule within the existing funding package. A series of five strategic Cost to Go workshops have been undertaken to address the emerging cost pressures and reduce the existing Cost to Go at project level. The integration of outputs from the workshops comprised of opportunities, actions and principles that were presented to the TfL Commissioner on 12 August 2021. These form the plans that underpin the delivery of targeted opportunities intended to mitigate funding pressure and inform the cost component of the schedule update exercise for the ELDG in September 2021. Subsequently, approved outcomes will be change controlled and aligned to the DCS1.2 [REDACTED]

[REDACTED]

[REDACTED]

CRL agrees with the Project Representative's comment regarding the importance of collaboration and the establishment of an integrated work ethic between CRL and our RFLI colleagues. This working relationship is demonstrated through but not limited to the progressive joint approach taken to the incorporation of the J6 Staging Access Plan into the DCS1.1 and the success of the June/July 2021 Blockade. Likewise, collaborative working relations exist with other stakeholders, LU and MTR, with the handovers of six Central Section Stations to date; this includes the handover of Paddington station which took place on 6 August 2021. Readiness for Trial Operations will be demonstrated by all parties through the Crossrail Engineering Safety and Assurance Case (CESAC) for Entry into Trial Operations (EiTO), in a similar collaborative manner to the CESAC for Entry into Trial Running in March 2021.

The T minus countdown process for Trial Operations has been developed by RFLI, building on lessons learned from the Trial Running T minus countdown process. An initial review was conducted by the Executive team on 2 August 2021 and the process will commence imminently at T-16; this is significantly earlier than for Trial Running which started at T-8. Key metrics from the T minus countdown to Trial Operations process will be based on the EiTO Criteria. At the time of writing, the Trial Running Staging Plan (currently J6) is undergoing a review with the intention to incorporate the Tunnel Vent System (TVS) mode and air flow testing into the Trail Running Staging Plan which will become the Staged J7 Plan following a change control process.



CRL has produced a matrix of scope/functionality for software releases and is currently reviewing systems descriptions to confirm full alignment with the matrix. This is a live plan and recent success with the TVS mode changes and Windows 10 upgrades have allowed final proving tests to be planned with certainty and as previously mentioned – these elements will be built into the next Staged Plan iteration, J7. Final checks of the EiTO evidence list has commenced and discussions have been held in relation to RFLI assurance evidence that is required for endorsement of CESAC for EiTO covering maintenance and operational readiness.

I hope this response provides a useful summary of the measures in place to address the specific issues you have highlighted. A more comprehensive response focussed on the content of the Sponsor Summary report will be issued as an Appendix to this letter.

Kind regards,



Mark Wild
CEO, Crossrail

Appendix – CRL Response to Period 3 PRep Report

Programme Response Category	PRep Period 3 Sponsor Summary Content	CRL Period 3 Response
<p>Observations in the Period</p>	<p>CRL continues to make positive steps towards the opening of the Elizabeth Line, although some significant challenges remain in the short term to integrate the railway for start of Trial Operations. Blockade works started as planned on 21 June 2021 and, while initial performance was slow, recovery allowed a substantial amount of the trace-dependent works to be completed. Woolwich and Liverpool Street Stations achieved SC3 ROGS/BIU on the planned deterministic dates; Paddington Station is forecast on 23 July 2021, with Whitechapel Station on 23 August 2021.</p> <p>Train running was paused as planned for the June/July 2021 Blockade, but resumed with an 8 TPH service, before quickly stepping-up to a more intensive 12 TPH service. This will allow further mileage accumulation prior to the next major blockade in [REDACTED], for the deployment of ELR100 and completion of Tunnel Ventilation System (TVS) upgrade works.</p>	<p>In line with the Project Representative’s comments, the June/July Blockade concluded as planned and was an excellent collaborative and safe performance between RFLI and CRL Delivery teams, completing 95% of the planned Blockade work. The remaining activities are being progressed through the Element Outstanding Works List burn down process.</p> <p>Following the Blockade as planned, 12TPH Trial Running commenced. As expected, this has highlighted areas needing further work and will be a focus over the coming weeks in anticipation of the [REDACTED] Blockade.</p> <p>Woolwich and Liverpool Street stations achieved handover as deterministically planned on 25 June and 5 July respectively and brings the number of stations handed over in readiness for Trial Operations to six; this includes Paddington station which was handed over on 6 August 2021. Again, this is the result of a significant collaborative effort from CRL and RFLI as well as LU and MTR.</p> <p>CRL agrees with the Project Representative’s comments in the period regarding the Trial Running phase and readiness for the next major Blockade planned for [REDACTED].</p>

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	<p>The Access Control Unit has made progress with identifying access improvements and will manage all access requirements for CRL and RfLI through to Trial Operations. The access improvement plan is expected to be implemented by the end of Period 4; this should increase the available work time and significantly reduce the volume of maintenance works that require traction power isolations.</p>	<p>The Access Improvement Implementation Project (AIIP) initiative has been implementing improvements prior to the commencement of the Blockade and the average time on tools post-Blockade has increased significantly. The revised Green Book has now been issued and implemented giving rise to an estimated increase in productive time of 40 minutes. However, the Green Book does not allow significant volumes of work to be done under live traction, but rather allows significant work to be done under isolated traction without the application of portable earths (the motorised ones are engaged) provided the work is more than one metre from the conductor.</p>
<p>Headline Concerns</p>	<p>Period 3 has been dominated by the completion of outstanding trace-dependent routeway EOWs during the June/July 2021 Blockade. Verification of competent safety specialist resources hindered the early part of the blockade, but the teams worked collaboratively, resulting in the completion of a large proportion of the planned physical works. A post-blockade review is intended to identify the residual works that will require further trace access; these works are likely to be scheduled into the available maintenance windows ahead of the [REDACTED] Blockade. It is important that CRL now efficiently processes the blockade outputs to close-out the open issues in its management systems (particularly eB); this, in turn, will allow the completion of assurance documentation. Historically, this close-out process has lagged increasingly behind the completion of activities</p>	<p>The Project Representative is accurate to point out the significance of reducing the amount of trace-dependent works during the June/July Blockade. The capture of Blockade evidence into enterprise Bridge (eB), CRL's document management system, for dependency closure is underway and remains a priority for assurance completion. Any outstanding works shall be reprogrammed for incorporation into the Element Outstanding Work List (EOWL) burn down process.</p>

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	<p>on site and there are already signs that this is happening again.</p> <p>Integration of CRL’s plan for the completion of safety assurance documentation for entry into Trial Operations with RfLI’s assurance process, is not clear. A fully integrated programmatic approach between RfLI Operations and CRL’s Project Team, including the Rail Operator MTREL, is required, which will benefit readiness for Trial Operations. This includes visibility of both CRL and RfLI performance and the tracking of interdependent assurance, operations and maintenance activities. Reliability is currently significantly down against RfLI’s plan and this will need to substantially improve for entry into Passenger Service.</p>	<p>The integrated plan for completion of safety assurance documentation for entry into Trial Operations is clear. The outline strategy was presented to the RFLI General ITAP in May 2021. This has been incorporated as an Assurance Fragnet into the DCS 1.1 (J6) baseline. The detailed schedule of safety assurance submissions to RFLI ITAP meetings is being finalised with the principles already agreed by CRL, RFLI and MTREL.</p> <p>Readiness for Trial Operations will be demonstrated by all parties through the Crossrail Engineering Safety and Assurance Case (CESAC) for EiT0, in a similar manner to the CESAC for Entry into Trial Running in March 2021. The GSN for this has been endorsed by the RFLI General ITAP. The supporting evidence list is about to be finalised by all parties.</p> <p>The achievement of sufficient reliability of operations for the CCOS EiT0 and then Entry into Revenue Service is monitored by the Elizabeth Line Reliability Board. A significant improvement in reliability is expected with the introduction of the next main signalling upgrade as ELR100.</p>
	<p>As CRL and RfLI seek to drive to the deterministic date for the start of Trial Operations, a countdown process will need to be implemented. It is expected that the Operator and Infrastructure Manager will play a critical role in driving this process to achieve Trial</p>	<p>The Project Representative is accurate in its assessment of CRL’s commitment and the combined effort at play between CRL and RFLI to achieve the deterministic date for the start of Trial Operations. The T minus countdown process for Trial Operations has been developed by the</p>

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<p>Operations. The main objective will be to meet the criteria required for exiting Trial Running and entering into Trial Operations, which will be driven from the Operator's scope and functionality plan. To date, there has not been the visibility of the process and, while the criteria required to enable a successful transition from Trial Running to Trial Operations is established, this is likely to be further scrutinised by CRL and RfLI.</p> <p>The scope to complete is now determined for the start of Trial Operations, and the main concerns for completing the Trial Running period are: the close-out of Dependencies, completion of Safety Justifications and associated documentation, and obtaining ORR approval. Achievement of the necessary levels of reliability will require the anticipated improvements in ELR100 software, as well as in the Platform Screen Doors and SCADA systems, to be delivered.</p> <p>The implementation of Tunnel Ventilation System upgrade works has been impacted by difficulties with site access. It is encouraging that advance works have been completed, but a focus will be required to secure access for completing the necessary staging activities, before testing during the [REDACTED] Blockade.</p> <p>Completion of the Maintenance Bridging Work continues to be a concern; RfLI's Maintenance Plan is expected to identify completion of these works. To date, performance dashboards giving</p>	<p>RFLI, building on lessons learned from the Trial Running T minus countdown process. An initial review was held on 2 August 2021 and the process will commence imminently at T-16. This is significantly earlier than for Trial Running which started at T-8. Key metrics from the Trial Operations T minus countdown process will be based on the Entry into Trial Operations (EiTO) Criteria.</p> <p>The Project Representative is accurate to state the scope required for the start of Trial Operations has been defined. The update of Safety Justifications and closure dependencies is planned out for support to EiTO; no approval from the Office of Rail and Road is required for EiTO. The level of reliability acceptable for EiTO will be agreed through the Elizabeth Line Reliability Board, including review of reliability post commissioning of the ELR100 software.</p> <p>Access for the Tunnel Ventilation System (TVS) upgrade works is being built into the Staging Plan. However, majority of the works to be undertaken, does not require additional access but rather repurposing of the existing access for Systems Train Testing (STT) to TVS works and using the contingency in the J6 Staging Plan for STT.</p> <p>The Maintenance Bridge Works are in the final stages of being planned, however, aspects of the works are underway as part of routine planned maintenance. All Pressure Release Valve works</p>	
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	<p>the actual work achieved against the forecast have not been visible to the management team; this information is necessary to give confidence in the work to complete up to Trial Operations.</p> <p>CRL's schedule and costs are impacted by slippage against deterministic dates for the start of Trial Running, ELR100 software and frustrated access issues affecting stations. Consequently, the deterministic dates for Trial Operations and Stage 3 Passenger Service have slipped against DCS v1.1. Canary Wharf Station completion is threatened with further slippage, and Bond Street Station is yet to confirm its readiness date for SC3 ROGS/BIU, although this is expected to slip into [REDACTED].</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>There remains some uncertainty around scope ownership and the timing of delivery of the critical [REDACTED] works. A likely consequential impact of all these items is an increase to the costs. Initial data, however, suggests that CRL's opening window</p>	<p>were completed by ATC in the June/July Blockade and other Fire main pressure tests are underway. The largest element of work is Overhead Line Equipment inspections and these are now due to commence in Week 21, the decision taken to start later (originally due in Week 18) but plan for up to six shifts per week for efficient use of resources and to avoid clashes with emerging TVS works ahead of that date. It is still intended to conclude works ahead of Trial Operations. Furthermore, a Project Manager has brought in from the IDPC to ensure planning and reporting is robust.</p> <p>The Project Representative is correct in stating that access complexities have impacted on schedule pressures. The 18-day June/July Blockade which achieved 95% productivity, largely delivered the mitigation around access and productivity issues, with Trial Running currently underway. Conversations continue across all parties to ensure alignment relating to scope ownership and timing of delivery.</p>
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	<p>of Summer 2022 for Stage 3 opening remains valid.</p> <p>Progress has been made relating to the delivery of the end-to-end railway and completing the opening stages after Stage 3. This extends to the scope, assumptions, high level planning and identification of access arrangements for software configuration ELR200, and ELR21X, leading to Stage 5B opening. [REDACTED] is likely to be the deterministic date for Stage 5B opening. An updated strategy is expected to be reflected in DCS v1.2 when it is finalised in Period 5. Finalisation of commercial arrangements for [REDACTED] and [REDACTED] will be important for this phase of delivery.</p> <p>Our concerns are summarised below:</p> <ul style="list-style-type: none"> • The Elizabeth Line completion plan has yet to be finalised in DCS v1.2 and risk assessment is still necessary to provide certainty to key milestone dates and final costs; 	<p>CRL agrees with the Project Representative's assessment of the end-to-end Programme configuration. [REDACTED] [REDACTED] [REDACTED]. CRL submitted the core logic to the post-Stage 3 railway to the Period 3 Elizabeth Line Delivery Group (ELDG) which has been accepted. This logic was fed through the projects' riding instructions for Period 4, with the projects' forecasts being subject to the business as usual schedule integration during the Period 4 governance, that is, the governance covering Period 4's position, which occurs in Period 5.</p> <p>In response to the Project Representatives summary concerns, CRL responds as follows:</p> <p>Cost and risk largely follow the schedule, and these assessments – while being undertaken concurrently where possible will be the subject of focus during the Cost to Go STAR chambers in week commencing 2 August 2021. The outcomes of this will likely be submitted to the Period 5 ELDG once they are synthesised. However, Period 4 DCS1.2 baseline position will reflect the strategy to deliver the Elizabeth Line to timetable Stage 5C. The risk assessment will be updated to reflect the final DCS 1.2 plan and include outputs of workshops held with [REDACTED]</p>
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	<ul style="list-style-type: none"> • Interim schedule DCS v1.1 J6 is tightly constrained and prolonging of works delivery on site continues to impact the testing with trains and 12 TPH trials; • A countdown readiness process with agreed entry criteria and transparent decision making is needed to meet the deterministic milestone date for Trial Operations; • CRL and RfLI appear unable to resolve and bring to the point of delivery pre-Passenger Service scope which has been jointly agreed; 	<p>Signalling (for ELR200 and ELR21x software updated) and Operations disciplines.</p> <p>Testing and Commissioning performance is monitored daily and aligned to the Deterministic DCS1.1-J6 Plan that incorporates the revised J6 Staging Access Plan. Trial Running at 12TPH is ongoing with detailed analysis following each day of running to establish railway performance and root cause of any issues.</p> <p>As stated previously, the T minus countdown process for Trial Operations has been developed by RFLI, building on lessons learned from the Trial Running T minus countdown process. An initial review has been held and the process will commence imminently; significantly earlier than for Trial Running which started at T-8 countdown. Key metrics will be based on EiTO Criteria.</p> <p>Following several reviews, base and instructed scope has been agreed for delivery against critical milestones to support EiTO. There are a few items of scope that require operational workarounds for an interim period, these have largely been agreed with RfLI. There are a small number of items that are either new or do not have operational workarounds that are being reviewed and agreements are being sought. In addition, there is a series of deep dives being chaired by RfLI with support from CRL and oversight of the TfL Commissioner to review, ratify and agree approaches to scope to go as 'One Team'. These will be concluded in the next two weeks and fed into the finalisation of DCS 1.2</p>
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	<ul style="list-style-type: none"> • Agreement is outstanding on remaining scope which is not essential for Passenger Service, and on the most cost-effective delivery mechanism (e.g. Residual Works Team) if it is required. 	<p>to become the definitive scope for entry into Revenue Service.</p> <p>These are the subject of five Cost to Go workshops covering LU stations, RFLI stations, Routeway, Indirects and Operations and Maintenance of which key considerations will be:</p> <ul style="list-style-type: none"> - Essential scope for a safe and reliable service - [REDACTED] - Appropriate contingency provision for the stage of the project and, - Appropriate delivery mechanisms for EOWLs to minimise cost of delivery.
<p>Health & Safety</p>	<p>In Period 3, one High Potential Near Miss and one RIDDOR occurred related to construction; 44 incidents and accidents were associated with railway operations. CRL’s Safety Performance Indicator increased slightly; however, the overall indicators remain within those set by the Programme. Close-out of an electrical incident at Bond Street Station and communication improvement for access related to Tunnel Ventilation System equipment, are high safety priority actions for the management teams. Covid-19 cases linked mainly to transmission from outside the Programme increased considerably in Period 3.</p>	<p>CRL notes the Project Representative’s comments regarding Health and Safety performance in Period 3 as accurate. CRL agrees with the Project Representative’s comments in relation to the spike in numbers of COVID-19 cases being reported across sites. These are being closely and carefully monitored through the Gold Response Team structure. Health and Safety of all staff working across the Programme continues to be of the utmost importance.</p>

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<p>Programme Overview:</p> <p>Schedule</p>	<p>As a consequence of the initial 6-week delay to the start of Trial Running, frustrated access issues, and delay to the deployment of ELR100, CRL has revised its strategy for the start of Stage 3 Passenger Service and has confirmed a new delivery plan. DCS v1.1 J6 is an interim schedule, which allows CRL to measure performance while DCS v1.2 development is completed. This plan indicates a P50 date of ■■■ February 2022 for the start of Trial Operations, although CRL will push to deliver to its deterministic date of ■■■ November 2021.</p> <p>The start of Stage 3 Passenger Service is partly driven by achievement of the deterministic dates, and, this period, CRL is forecasting a deterministic date of ■■■ February 2022 and a P50 date of ■■■ May 2022. This is largely driven</p>	<p>CRL concurs with the Project Representative’s assessment of the schedule configuration in the lead up to Revenue Service. Detailed daily planning of work to be undertaken during the Trial Running period has resulted in a new J6 Plan. This has had the result that completion of the Trial Running stage has been extended from ■■■ September 2021 to ■■■ November 2021. The J6 plan allows for:</p> <p>Inclusion of two construction Blockades: the first which has been completed successfully with 95% productivity from 21 June 2021 to 8 July 2021. The Second Blockade is planned for ■■■■■■■■■■ for a duration of ■■■■■■■■■■ to complete critical trace impacting EOWs, commission ELR100 Signalling System, migrate TVS from Windows 7 to Windows 10 and commission BT Turret telephony.</p> <p>Further mitigations include:</p> <ul style="list-style-type: none"> - Increase STT shifts such that there is a 25% contingency. - Provide an additional seven days equivalent of maintenance. - Allow for 55 days of timetabled running. - Include ten days of contingency and a full week of firebreak prior to commencement of the second Blockade. <p>While CRL agrees with the Project Representative’s overall statement, CRL would like it noted that the Deterministic date for the start of Stage 3 is driven by the achievement of Deterministic dates. The risk assessed P50 date</p>
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<p>by deployment of software ELR11X in December 2021 with its associated timetable running, as well as assurance activities. However, slippage against deterministic dates based upon DCS v1.1 is resulting in impacts across the Programme, most notably in the [REDACTED] [REDACTED] which is leading to additional cost increases.</p> <p>Having received ELDG approval for the replacement of Stage 4 with 5B, the management teams have focussed on finalising the scope, access planning, risks and delivery strategy for Stage 5B opening, as well as the final Stage 5C. This will provide the outstanding input to finalise DCS v1.2 and is expected to be completed towards the end of Period 4 (end of July 2021); it is also expected to be assured by LoD2 in Period 5. Initial indications suggest that CRL requires further reviews to ensure that all scope items are fully accounted for, particularly in relation to [REDACTED]. While [REDACTED] scope and allowances to the end of the Programme are fully identified, scope previously not accounted for will result in additional cost increases.</p> <p>The June/July 2021 Blockade started on 21 June 2021, dedicated to completing the remaining physical works within the routeway, stations and shafts. To overcome the initial challenges with access and resource competency, station works scheduled for completion in the first 8 days of the blockade were re-planned to cover the entire period and</p>	<p>is [REDACTED] May 2022 for the start of Stage 3. [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]</p> <p>CRL notes and agrees with the Project Representative's comments in the period in reference to post- Stage 3 configurations and delivery strategies. As mentioned previously, CRL submitted the core logic to the post-Stage 3 railway to the Period 3 ELDG which has been accepted. Subsequently, the logic was fed through the projects' riding instructions for Period 4, with the projects' forecasts being subject to the business as usual schedule integration during the Period 4 governance, that is the governance covering Period 4's position, which occurs in Period 5.</p> <p>The Project Representative is accurate to state that the June/July Blockade was successful in achieving its principal objective which significantly reduced the number of trace-dependent works and alleviated a considerable amount of access complexities CRL has encountered since the transitioning to a ROGS environment. This was</p>	
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<p>Commercial and Risk</p>	<p>were merged with the routeway works. The objectives of completing the majority of EOWLs for stations and the routeway trace-dependent physical works, appear to have been largely achieved, with greater than 90% overall completion. Review of the EOWLs is ongoing, but initial indications suggest that approximately 100 EOWLs remain that will require trace access for clearance. Bond Street Station EOWL closure for SC2 to support Trial Operations is also being clarified, which could result in a further 75 EOWLs requiring trace access. All outstanding EOWLs will be the subject of review and re-scheduling into existing access windows prior to Trial Operations.</p> <p>CRL is now planning for the next major blockade, scheduled to start on [REDACTED]; it will include lessons from the most recent blockade, particularly on access and working arrangements under the RfLI Rule Book.</p> <p>At the Period 3 EPPR, CRL presented four AFCDC options requesting CRL Executive decision. None of the options was considered acceptable and it was agreed that further intervention was necessary to rationalise scope and cost provisions.</p>	<p>achieved at 95% productivity without any significant health and safety incidents.</p> <p>CRL concurs with the Project Representative’s comments regarding the second Blockade planned for [REDACTED]</p> <p>In Period 3, it was decided by the Executive team that increases presented, particularly by the Routeway projects, were not sufficiently robust. Varying assumptions were used in relation to prolongation where worst case scenarios were assumed compared to the most likely scenario. In addition, it was considered that further opportunities were possibly available to release risk and scope monies pending a further review for potential duplication.</p>
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	<p>deterministic milestones, we expect the overall outturn cost to be at P50 levels; and the prolongation provision will become fully committed.</p> <p>In the last two periods, CRL and RfLI held a series of workshops to finalise completion of scope items ahead of Stage 3 Passenger Service. While there is broad joint agreement on the scope remaining, which provides significant underpinning for DCS v1.2, the deferral of scope that is not essential is now required to minimise the threat to the funding limit. [REDACTED] [REDACTED] [REDACTED] Conclusion of the underpinning commercial strategies within DCS v1.2 is important for the determination of the final AFCDC. CRL's management team recognise the emerging threat to the [REDACTED] funding limit, and will undertake further deep-dive analysis of its scope and cost allowances in mitigation.</p> <p>Finalisation of [REDACTED] [REDACTED] is required to support the update to the Passenger Service deterministic date, the completion and delivery of scope to opening of Stage 5B and the end of the Programme. These are expected to be completed by the end of Period 4, once scope ownership is fully identified, and schedule and costs are aligned between all parties.</p>	<p>Whilst there are pressures emerging across the Programme, CRL is reviewing all remaining project scope with the Infrastructure Managers and Operators to determine what is critical for the delivery of a safe, reliable and maintainable railway. A series of workshops are due to be held in Period 5 to review the remaining cost to go and provide agreed action areas to mitigate cost pressures.</p> <p>[REDACTED] [REDACTED] [REDACTED]. The final determination of scope for delivery post-Revenue Service (and transfer to TfL) will then conclude the delivery strategies and subsequently the close out planning.</p> <p>As it stands, [REDACTED] [REDACTED] to meet the rephased Passenger Service dates, as any changes or variations of time can be captured, measured and agreed under the [REDACTED] since the assets have not yet been Taken Over.</p>
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<p>Organisation</p>	<p>[REDACTED] [REDACTED] [REDACTED] [REDACTED] This will increase the cost pressures across the Programme AFCs.</p> <p>The newly established Access Control Unit has secured 10 of the 15 resources required to support the team.</p> <p>We continue to be concerned at the slippage of deterministic dates [REDACTED] [REDACTED] [REDACTED] [REDACTED]</p> <p>An emerging concern is the sharp rise in Covid-19 cases impacting the Programme in the period. With government relaxation of lockdown restrictions from mid-July 2021, CRL is maintaining current Covid-19 management practices, and will continue to monitor the situation. Recent rising Covid-19 case numbers</p>	<p>All resources are costed to deterministic dates. The prolongation risk is there to mitigate any extension required. As part of the overall cost review and preparation of the DCS 1.2, CRL is working to manage and mitigate any emerging resource cost pressures.</p> <p>At the time of writing, the number of resources secured has increased to 14 out of the additional 15 resources required.</p> <p>The Project Representative is right to raise concern regarding programme slippages in relation to [REDACTED]. The key staff required to complete the Programme have been identified and reviewed each period by the Executive Group. In addition, further work is underway to secure Project and Programme Authority to confirm resources to budgeted end-dates for the remainder of people on the Programme. [REDACTED] [REDACTED] [REDACTED] [REDACTED], regardless of any slippages in deterministic dates.</p> <p>CRL is managing and closely monitoring the spike in COVID-19 cases across the Programme through the Gold Response Team structure. As mentioned previously, health and safety of all staff working across the Programme is of paramount importance whilst delivering a safe and reliable railway.</p>
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<p>Stage 3 Trial Running, Trial Operations and Passenger Service</p>	<p>threaten the Programme at a critical time leading to Trial Operations.</p> <p>Trial Running was paused on 19 June 2021 to allow routeway and stations works to be carried out in the June/July 2021 Blockade. Prior to this, CRL operated an 8 TPH service for two weeks, allowing experience and confidence of drivers and operational staff to be built further. Of the scheduled mileage, 76% was achieved in the final week, with an average PPM of 61%, although ETCS and PSD failures continued to impact performance. Performance across the signalling transitions with Network Rail has generally been good. Following blockade completion, 8 TPH trials were scheduled for 1 day before ramping up to 12 TPH; however, some challenges were experienced in the initial days of 12 TPH trials.</p> <p>Infrastructure maintenance was carried out in the period, although productivity has continued to be affected by access constraints. Process improvement continues through the Engineering Hours Improvement Programme (EHIP), which has included consultation on adjustments to the Green Book and Auto-Switching. Both of these are expected to result in an improvement in the time available for maintenance, from 2 to 4 hours. The agreed plan to complete the maintenance works ahead of Trial Operations will still be a challenge, principally because safety critical resource availability is limited;</p>	<p>CRL agrees with the Project Representative's comments on Trial Running. Timetabled running at 12TPH is ongoing with detailed analysis following each day to establish the railway performance and root cause of any issues.</p> <p>Due to process improvements, the average productive maintenance window post- Blockade was 3h 50 min and 3h 25 min for weeks 14 and 15 respectively. This was prior to the introduction of the Green Book and Auto Switching improvements. Cyclic maintenance works are now being robustly delivered with plan versus actual at approximately 85% for the two weeks following the Blockade. A more robust and longer-term plan, rostering planning resources over-night and a new focus on a Maintenance Improvement Plan with weekly review and metric based is starting to bear fruit. The revised Green Book (going live on site from 27th July 2021) will</p>
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	<p>however, the reduced requirements for traction power isolations may alleviate this issue.</p> <p>The 8-week delay to ELR100 deployment provides CRL with additional time to fully plan the [REDACTED] Blockade. Focus will be to ensure all the latest refinements to the access process are included, to maximise productivity and complete ELR100 deployment and TVS works. Successful implementation of ELR100 will result in a significant reduction in the current number of Operational Restrictions.</p> <p>The Trial Operations functionality matrix requires agreement between CRL and RfLI for entry into Trial Operations. This document sets out the alignment between parties on the functionality for the system configuration or the mitigation measures that are to be in place, by the start of Trial Operations.</p> <p>System Testing with the Train (STT) up to the [REDACTED] Blockade has been re-baselined in accordance with the latest Trial Running staging plan, which now includes contingency for STT testing. This will be incorporated into DCS v1.2. All 16 STT tests performed since ROGS transition have passed; a further approximately 120 tests are required to support the assurance case for Trial Operations.</p>	<p>reduce the time necessary to get an isolated worksite but will also reduce the complexity and simplify planning and delivery arrangements. A data cleanse of Crossrail Enterprise Asset Management Solutions, the data migration centre, is also allowing focus on back lock and non-compliance. CRL remains confident in the longer-term plan.</p> <p>CRL concurs with the Project Representative's evaluation of the benefits to the delay and subsequent deployment of the ELR100 signalling software.</p> <p>CRL agrees with the Project Representative's assessment of the Trial Operations functionality matrix in readiness for the commencement of Trial Operations.</p> <p>The Project Representative is accurate in stating that system testing with trains has been re-baselined to include contingency and aligned to the latest Trial Running plan.</p>
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Assurance	<p>████████████████████ ████████████████████</p> <p>Challenges remain with the production and processing of assurance documentation at Canary Wharf Station. The recent T-12 readiness review was unsuccessful, which would indicate that the deterministic ██████████ date for SC3 ROGS/BIU is at risk and may slip into ██████████. CRL is addressing this through additional resources, and a refinement of the assurance process for Acceptance Certificates.</p> <p>While the Bond Street Station team has confidence in its productivity assumptions, a detailed risk review of the BIU date is expected, which will be reported in Period 4. The station progress review indicated that there is still significant pressure to meet CRL’s earliest accelerated date for SC3 ROGS/BIU. ██████████ will not be able to support SC3 ROGS/BIU in ██████████, even with reduced functionality. CRL’s target date for SC2 is ██████████ however, there is pressure on this date, and the team is implementing mitigation measures to recover a 2-week delay.</p> <p>CRL has exerted considerable effort to make the June/July 2021 Blockade works a success, achieving the majority of its planned physical works. It is important that the physical works evidence is processed efficiently, to provide</p>	<p>The challenges that the Project Representative points out that CRL has encountered at Canary Wharf station have caused its handover date to slip to from ██████████ to the latter part of ██████████.</p> <p>The Project Representative is accurate in pointing out that CRL is addressing these challenges by securing two further resources. The first additional resource is in position to focus on construction, and the second will focus on Assurance.</p> <p>The SC2 milestone date at Bond Street station has slipped from ██████████ to ██████████. Schedule reviews are being held on 5 August 2021 to establish a baseline schedule and a clear path to costing by 20 August 2021. This is under direction given at LU Station Cost review with the Executive team.</p> <p>CRL concurs with the Project Representative’s assessment of the June/July Blockade. The assurance evidence from the Blockade is being fed into the EOWLs burndown tracking and to closure of any related Safety Justification</p>
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<p>Future Stages</p>	<p>timely verification support to the assurance process. Initial indications suggest there is currently a widening gap in the delivery process, that could grow further if not addressed swiftly and, in turn, impact the Trial Operations start date.</p> <p>Completion of the Tunnel Ventilation System upgrade is important, as these staging works now require more access than originally planned, ahead of the ██████ Blockade. Completion of these works will be necessary to support the assurance process before entering Trial Operations.</p> <p>A significant number of the trace-dependent stations EOWLs were completed in the June/July 2021 Blockade. This means that the majority of the remaining station EOWL works will not be reliant upon future blockades. However, a substantial number of EOWLs are located in station areas.</p> <p>CRL and RfLI are working collaboratively to define the schedule components and activities required to enter into service for Stage 5B and 5C. This includes engaging with its supply chain for delivery of ELR200 and developing appropriate access planning in 2022 for its</p>	<p>dependencies. This is closely monitored to ensure that the evidence of works continues to feed into the assurance process.</p> <p>CRL agrees with the Project Representative's comments regarding the importance attached to completing the TVS upgrade works. Significant effort has been directed to the inclusion of enabling works into the Trial Running Access Plan. This is to ensure that the TVS changes can be successfully commissioned as part of the ██████ Blockade.</p> <p>The Project Representative is correct to point out the substantial contribution made by the June/July Blockade in alleviating trace-dependent works and the impact this has on EOWLs work moving forward.</p> <p>The status of EOWLs is monitored on a station by station basis with each station having a specific works to go plan put in place to support a T minus review process for EiTO and subsequently, Entry into Revenue Service.</p> <p>The Project Representative is accurate in stating that CRL and RfLI are working collaboratively to define the schedule components and activities required to enter into service for Stage 5B and 5C. This includes engaging with its supply chain for delivery of CBTC ELR200 and ELR21x and</p>
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	<p>deployment. It is expected that the schedule for Stage 5B and 5C will be included in DCS v1.2. Finalisation of commercial arrangements for essential contracts to deliver scope to support Stage 5B opening has still to take place. It is likely that CRL and RfLI will target Stage 5B opening in [REDACTED]. The achievement of acceptable levels of reliability and accumulated mileage will be important pre-requisites that will be monitored by the Stage 5B steering group when it forms in Period 4.</p>	<p>developing appropriate access planning in 2022 for their deployment. It is expected that the schedule for Stage 5B and 5C will be included in DCS v1.2. Finalisation of commercial arrangements for essential contracts to deliver scope to support Stage 5B opening is yet to take place. It is likely that CRL and RfLI will target Stage 5B opening in [REDACTED]. The achievement of acceptable levels of reliability and accumulated mileage will be an important prerequisite that will be monitored by the Stage 5B Steering Group when it forms in Period 4.</p>
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