



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

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

17 June 2021

Dear ██████████,

Re: Crossrail PRep Project Status Report 150 – Period 1

I am writing in response to the P1 PRep Sponsor Summary cover letter.

Since the transition of the CRL programme to a ROGS environment on 27 March 2021, there have been a number of challenges across the programme principally related to access issues. An independent review has been commissioned that has identified actions to improve planning, productivity, prioritisation and, most importantly, safety across the programme. Access metrics as well as a single integrated Access Control Unit is being put in place; the latter will manage all access requirements between RfLI and CRL including delivery, maintenance and operations. A key tangible output of this intervention has been the introduction of specific access metrics for the trace, with the stations secure room access metrics in development. This will enhance the programme's oversight of a key pressure point.

To attain higher productivity rates, there are two planned Blockades: an earlier June to July Blockade to clear out majority of the trace dependent works thereby reducing (but not eliminating) the dependency on access applications, and a later Summer-Autumn Blockade linked to ELR100 software commissioning and TVS software migration. The imminent June Blockade will be free of operations and maintenance activities to maximise the opportunity to complete works in a Blockade-style approach similar to the successful Summer Blockade in 2020 which achieved 97% productivity.

A key element of the Programme Baseline 1.2 activity is the refresh of the Delivery Control Schedule (DCS)1.1. This refresh is underpinned by the pre-existing schedule logic and is subject to CRL's change control system that will take into consideration the impact of the ██████████ delay to the start of 4TPH trial running, including calculating this effect on targeted interventions such as the Blockade configurations. In parallel, a CRL and RfLI joint Working Group is undertaking scenario planning to model the impact of the potential ELR100 delay, currently estimated at ██████████ weeks on the Trial Running Plan. This is a key pressure point on the Deterministic DCS1.1 Baseline and the overarching factor that will inform the Programme Baseline1.2 update given Trial Operations' dependency on the commissioning of ELR100 and Revenue Service's dependency on Trial Operations.

The Programme Baseline 1.2 activity will be presented to the Executive team in ██████████, with active engagement in its constituent parts as they are developed. Specifically, The Executive

MOVING LONDON FORWARD



reviews in June are being used to decide upon the overarching strategy that will minimise the potential impact on the commencement of Trial Operations as a consequence of the forecast delays to the commissioning of ELR100 software and its subsequent iterations. As stated above, all changes that will be incorporated into the approved DCS1.1 baseline will undergo CRL's change control process and will be supported by the pre-existing schedule logic that [REDACTED] unchanged.

The Project Representative has raised concerns regarding planning to targets, the relevance of the Programme Baseline activity when completed, and over-optimism. I, and CRL, take these concerns seriously. It is well established that we use two key confidences in our schedules: (a) Deterministic – i.e. the shortest path to completion without allowance for probabilistic uncertainty which is the confidence that CRL promotes in order to achieve the earliest possible outcomes and (b) P50 – i.e. a risk assessed schedule whereby 50% of estimates through quantitative modelling fall within the P50 dates; this is a good middle estimate incorporating allowances for longer activity durations and our demonstrated performance provides confidence that the P50 schedule can be depended upon. The two confidence scenarios were used for the DCS1.1 and will support the DCS1.2 refresh.

During weekly performance meetings with the Executive, RfLI, MTR and TfL, the focus is on opening the Elizabeth line as early and as safely possible through managing against the Deterministic schedule, but a view on schedule performance against the P50 is maintained. During the four-weekly reviews, maintenance of the P50 scenario is reviewed to a greater extent including updating the modelling in cognisance of changes to the risk profile. It is useful to demonstrate the robustness of CRL's planning scenarios using the Trial Running with 4TPH milestone which was achieved on 10 May 2021: this milestone was achieved six weeks later than the deterministic schedule but a week earlier than the P50 schedule demonstrating a dependable schedule logic. In a similar vein, while there is pressure on the Trial Operations Deterministic date, this pressure is likely containable within the DCS1.1 P50 Baseline. An important critical-friend capability that CRL utilises is the active engagement of its independent, expert special advisors. These individuals have been brought in along the development to challenge and advise on CRL's work. Furthermore, the TfL Commissioner is actively engaged in the baseline update and key interventions underpinning it.

Regarding the ongoing relevance of the Programme Baseline post-completion, it is important to understand it represents an articulation within CRL's control systems of the optimised delivery strategy's impact on scope, schedule and cost. It is being progressively developed as the programme is executed – not just to accommodate actual performance, but to accommodate the emerging risk profile. A key example of this is the incorporation during the start of June of the emerging ELR100 pressures. Programme Baselines are inherently a point-in-time basis against which actual performance is assessed and the programme's reporting suite will realign to DCS1.2 and the Programme Baseline 1.2 when ratified.

With regards to the Project Representative's concerns regarding the incorporation of lessons from past experience into the ongoing schedule development, lessons learnt from the DCS 1.1 and LoD2 and LoD3 comments have been drawn upon to produce a LoD1 led self-assessment questionnaire, aimed at Delivery Teams across the programme to ensure alignment and robustness is maintained during the Programme Baseline 1.2 development exercise.



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 1 PRep Report

Programme Response Category	PRep Period 1 Sponsor Summary Content	CRL Period 1 Response
<p>Observations in the Period</p>	<p>Tottenham Court Road Station became the second London Underground station to achieve its BIU, and the third on the Central Section so far. With the Great Eastern Main Line interface commissioned as planned in the period, the Elizabeth Line can now be operated effectively as an end-to-end railway, from a signalling perspective. Software configuration TR2 Point Release 7 was commissioned prior to the start of Timetable Running on 10 May 2021 and contained fixes which have allowed the removal of many operational restrictions.</p>	<p>In line with the Project Representative’s comments, Tottenham Court Road station achieved handover status and subsequent BIU on 05 May 2021. This is a significant step towards Trial Operations readiness with three of the nine central section stations now fully integrated with TfL’s procedures. As noted by the Project Representative, the Great Eastern MainLine was commissioned as deterministically planned as was the software configuration TR2 Point Release 7 in readiness for timetabled Trial Running which commenced on 10 May 2021.</p>
<p>Headline Concerns</p>	<p>Completion of Maintenance Bridging Works within the Controlled Introduction Period has proved more problematic than was anticipated by CRL and RfLI. Low productivity was among several issues which led to a [REDACTED] delay to the deterministic start date for 4 TPH Timetable Running, achieved on 10 May 2021; this was slightly earlier than the P50 date. Difficulties with access to track and station equipment rooms have been a common feature this period and continue to pose a significant threat to completing the works; while being addressed, long term improvements will be slow to emerge.</p>	<p>The Project Representative is accurate to point out the unpredicted challenges encountered in completing the Maintenance Bridging Works. However, these works are ongoing and CRL and RFLI continue to work collaboratively to resolve any maintenance list and recommendation plan during completion to ensure compliance is upheld. The Trial Running Staging Strategy Plan has been agreed and the imminent June Blockade scheduled to cover a period of 18 days commences on 21 June 2021. It should be noted that the revised Trial Running Strategy Plan does not reflect any potential changes to ELR100</p>

Appendix – CRL Response to Period 1 PRep Report

<p>The delay to the start of 4 TPH trials has implications for the ramp-up to 8 TPH and 12 TPH, which are being evaluated through the finalisation of the Trial Running Staging Plan. It is unlikely that 12 TPH trials will start before mid-July 2021, and this will have a significant impact on achieving the mileage accumulation and reliability growth pre-requisites for Trial Operations. CRL continues to focus its planning activities on a target date for the start of Trial Operations of [REDACTED]. The DCS v1.1 P50 date of [REDACTED] April 2022 for the start of Passenger Service suggests that CRL is on track for Elizabeth Line opening before Summer 2022. However, this must be validated by QSRA once DCS v1.2 (now known as PBU v1.2) development has been completed.</p> <p>CRL’s schedule development for PBU v1.2 is based upon a multiple blockade strategy up to the start of Trial Operations. It is unlikely that the competing demands of train testing, reliability growth, operations and maintenance and the ramp-up to train running, will all be satisfied. Constraining project delivery teams to deliver to target dates will most likely necessitate compromises from key stakeholders (i.e. CRL, RfLI and MTREL). This will add further risk to the schedule, with high potential for activities to be undertaken out-of-sequence, and this will likely impact future rail performance and operations.</p>	<p>signalling configuration. A joint CRL and RFL Working Group is undertaking scenario planning to model the impact of potential ELR100 delays, currently estimated at [REDACTED]. Once agreed, this will be incorporated into the Trial Running Staging Strategy Plan and is currently underpinning the Programme Baseline1.2 as part of the risk profile update.</p> <p>The Programme Baseline1.2 is currently being reworked with a view to provide an agreed, updated baseline through to Revenue Service. Whilst this work is being finalised, the programme continues to use the agreed scope and logic within the current DCS1.1. The logic underpinning the DCS1.1 is stable, has proved reliable thus far, and will remain unchanged relative to the Programme Baseline1.2 update. Overall areas of concern, but in particular, the forecasted delays to the commissioning of the ELR software iterations that may impact on the commencement of Trial Operations currently planned for [REDACTED] [REDACTED] are being evaluated. The results and mitigations to minimise impacts will be shared with the Executive team at the upcoming ELDG meeting scheduled for 24 June 2021.</p>	
--	---	--

Appendix – CRL Response to Period 1 PRep Report

	<p>PBU v1.2 is the core plan for delivering the Elizabeth Line to a safe, realistically achievable and fully costed completion; it must be fully supported by all stakeholders to ensure successful transition from Trial Running to Trial Operations. PBU v1.2 development is constrained by the drive to achieve target dates, and this approach is distorting the schedule. When completed at the end of [REDACTED], it is possible that PBU v1.2 will be outdated and impractical, because of the cumulative effects of continuing delay and loss of productivity since transition into ROGS.</p> <p>Very low productivity since transition into ROGS means that there is a lack of comparable baseline metrics against which to measure future performance. There seems to be a high level of optimism and potential over-reliance on right-first-time execution and proposed mitigations. The prevailing challenges being encountered present significant schedule risks to target dates for entry into Trial Operations and Passenger Service. These include access to routeway and stations, isolations and possessions, and residual maintenance works, combined with emerging schedule delays for signalling software development and</p>	<p>Regarding the ongoing relevance of the Programme Baseline post-completion, it is important to understand it represents an articulation within CRL’s control systems of the optimised delivery strategy’s impact on scope, schedule and cost. It is being progressively developed as the programme is executed – not just to accommodate actual performance, but to accommodate the emerging risk profile. As mentioned previously, a key example and the overriding factor is the incorporation of ELR100 pressures that emerged at the start of June 2021. Programme Baselines are inherently a point-in-time basis against which actual performance is assessed and the programme’s reporting suite will realign the Programme Baseline 1.2 when ratified.</p> <p>The Project Representatives is accurate to point out low productivity rates since control of the railway has transitioned to RFLI which is an integral factor to consider for CRL to circumvent the complexities and challenges in delivery of works. Therefore, CRL approaches such challenges with a level of realism and anticipates several key updates to the revised schedule and further development in [REDACTED]. As stated above, key areas of concern that may impact entry into Trial Operations as currently planned are being assessed and the results and mitigations to minimise these impacts will be shared with the Executive team at the upcoming ELDG meeting in June 2021 where a decision on the overarching</p>
--	---	--

Appendix – CRL Response to Period 1 PRep Report

	<p>deployment, and completion of all assurance in demanding timeframes.</p> <p>Stations delivery has also been impacted by the access difficulties, with particular delays affecting Paddington, Bond Street, Canary Wharf, Liverpool Street and Woolwich Stations. These delays are compounding schedule slippage that has already occurred, and also have the potential to impact the start of Trial Operations.</p> <p>Appropriate performance metrics are fundamental underpinnings to any schedule, and their absence is a significant concern. The pursuit of target dates will most likely impact delivered scope, cost and quality, and Sponsors are advised to seek assurances from CRL as to the anticipated robustness and credibility of PBU v1.2.</p> <p>Our concerns are summarised below:</p>	<p>strategy and Block Plan for the Programme Baseline1.2 will be agreed.</p> <p>It is correct that Stations delivery has been affected by access difficulties, however, the imminent June Blockade scheduled to commence on 21 June 2021 aims to alleviate and eventually eliminate any impact on Trial Operations. Provided the blockade is successful, the results will support Trial Operations readiness.</p> <p>CRL is fully aligned with the Project Representative’s comment regarding the central importance of performance metrics underpinning the schedule. As part of the development of the Programme Baseline1.2, weekly performance meetings with the Executive, RfLI, MTR and TfL, focus on opening the Elizabeth line as early as safely possible through managing against the Deterministic schedule, but a view on schedule performance against the P50 is maintained. The metric suite supporting these meetings often provides a glide-path identifying what performance is required in order to meet the Deterministic schedule. This is balanced by the forecast from projects based on actual performance; this balance enables the delivery pressures to be contextualised on a production basis.</p> <p>In response to the Project Representatives summary concerns, CRL responds as follows:</p>
--	--	---

Appendix – CRL Response to Period 1 PRep Report

	<ul style="list-style-type: none"> • Development of PBU v1.2 is constrained to meet target dates, and will be superseded before implementation; • There has been no change to CRL’s reported Deterministic and Probabilistic dates, or to the AFCDC; • The Trial Operations target date of [REDACTED] is unrealistic; 	<p>Whilst Programme Baseline update is finalised, the programme continues to be supported by the agreed metrics that supports the current DCS1.1.</p> <p>While CRL understands the Project Representative’s concern regarding the validity of the Programme Baseline1.2 upon implementation, its development will not be constrained to meet target dates. CRL is fully aware of the future complexities this may cause.</p> <p>CRL held its Period 13 position as its forecast for Period 1, facilitating capacity on the programme to focus on Programme Baseline 1.2 activities. This plan was communicated in advance of Period 1 governance. Overlays were represented to the Executive identifying latest emerging issues, pressures and potential impact.</p> <p>CRL acknowledges the current challenges presented to meet the Deterministic Trial Operations commencement date of [REDACTED] and acknowledges the Project Representative’s concern. As stated above, forecast delays to the commissioning of the ELR100 software is the overriding concern that may affect entry into Trial Operations as currently planned and is being evaluated. The results and mitigations to minimise impacts on Trial Operations will be discussed with the Executive team at the upcoming ELDG meeting scheduled for 24 June 2021.</p>
--	--	--

Appendix – CRL Response to Period 1 PRep Report

	<ul style="list-style-type: none"> • PBU v1.2 must be robust, underpinned, fully assured and risk-assessed, to validate key delivery and P50 milestone dates. 	<p>CRL agrees with the Project Representative's comments on the necessary attributes that should be upheld within the Programme Baseline 1.2. CRL continues to work collaboratively to ensure a full risk assessment is undertaken and an updated QRSA/P50 position is established. Furthermore, emerging concerns are being reviewed, lessons learnt from previous experiences are being incorporated, LoD2 and LoD3 comments will converge into a LoD1 self-assessment questionnaire aimed at Delivery Teams across the programme. Any actions arising will be closed out and mitigations will be implemented to ensure the alignment and robustness of the Programme Baseline 1.2 development exercise. Furthermore, an important critical-friend capability that CRL utilises is the active engagement of an independent review of experts. These individuals have deployed to challenge and advise on CRL's work. The TfL Commissioner is actively engaged in the baseline update and key interventions underpinning it.</p>
<p>Health & Safety</p>	<p>Four High Potential Near Misses occurred in Period 1; two were related to access control. The Safety Performance Indicator decreased slightly, although the overall indicators remain within those set by the Programme. Since transition into ROGS, unauthorised access has accounted for over a third of all reported incidents across the Programme. Few new Covid-19 cases are being realised across the CRL sites.</p>	<p>CRL notes the Project Representative's comments regarding Health and Safety performance in Period 1 as accurate. CRL agrees with the Project Representative's comments in relation to the number of new COVID-19 cases being reported across sites.</p>

Appendix – CRL Response to Period 1 PRep Report

<p>Programme Overview:</p> <p>Schedule</p>	<p>In Period 1, CRL has held the DCS v1.1 forecast Deterministic dates for the start of Trial Operations on [REDACTED] and Passenger Service on [REDACTED]. The Probabilistic dates have also not changed since Period 12, while CRL updates its current DCS v1.1 baseline to PBU v1.2, to include all scope and activities to achieve Trial Operations and Passenger Service.</p> <p>To date, it is evident that schedule planning and delivery is heavily influenced by senior management aspirations for the earliest opening of the Elizabeth Line. PBU v1.2 development is constrained by these influences through workshops addressing the four main areas of the schedule, through to Trial Operations and Passenger Service, namely: scope, access, assurance and Trial Running Staging Plan. With key strategic risks now materialising, realistic productivity measures to underpin the schedule will be difficult to derive. Continued planning to target dates will drive out-of-sequence working and deferral of works that will require operational restrictions and import risk into the schedule.</p> <p>To support finalisation of PBU v1.2, 15 scope items that have a high operational impact have been identified. Additionally, a further approximately 300 other items are also being</p>	<p>The Project Representative is correct to point out that CRL has held the deterministic commencement dates of Trial Operations and Passenger Service at [REDACTED] and [REDACTED] respectively since Period 12. However, CRL is fully taking into consideration the challenges and complexities that have been encountered since transitioning to a ROGS environment. Emerging concerns will be reviewed and mitigated to support the programme achieving future milestones as planned within the Programme Baseline 1.2 development exercise.</p> <p>Schedule planning and delivery is driven by senior management aspirations for the earliest opening of the Elizabeth line as safely as possible, however, target dates are not being constrained or compromised to achieve this end in any manner.</p> <p>CRL notes the Project Representative’s comments in the period regarding the outstanding scope items identified to support the Programme Baseline update.</p>
--	---	---

Appendix – CRL Response to Period 1 PRep Report

<p>Commercial and Risk</p>	<p>evaluated and categorised, although this number is increasing. Key items have been selected for performance monitoring because of the significance of their impact upon operations and maintenance, if not completed. The Programme Change Panel is due to process the scope changes; the Panel is planned to be established by the end of Period 2.</p> <p>Finalisation of the Trial Running Staging Plan is challenging, as CRL works to accommodate all stakeholders; an example of this is the change in planning strategy from three to two blockades. CRL is attempting to accommodate the competing needs of the stakeholders, while also achieving early completion of works to expedite the assurance process. There are also implications to consider for train mileage accumulation and reliability growth, MTREL resource rostering and maintenance shifts. Given the resolution of ongoing access difficulties and emerging challenges associated with signalling software ELR100, it is likely that a complete and fully underpinned PBU v1.2 will slip beyond its forecast completion date of [REDACTED].</p> <p>Our Period 1 analysis is based principally on direct discussions with CRL finance representatives and the subsequent Period 1 EPPR report. The Period 1 Programme performance meetings (PDR and IPR) were cancelled, with CRL concentrating its efforts on developing PBU v1.2. Consequently, CRL is</p>	<p>CRL is committed to working collaboratively with all its stakeholders while simultaneously delivering the Elizabeth line at the earliest possible date – a bifurcated Blockade has been planned. The first Blockade in June to July aims to clear out majority of the trace dependent works, thus, minimising the dependency on access applications. The second Blockade is linked to ELR100 software commissioning and TVS software migration. The imminent June Blockade will be free of operations and maintenance activities to maximise the opportunity to complete works in a Blockade-style approach similar to the successful Summer Blockade in 2020 which achieved 97% productivity</p> <p>The approach taken in Period 1, as highlighted by the Project Representative, has been to hold the reported AF CDC whilst a number of critical activities were undertaken to provide further challenge and assurance to the cost, scope and schedule position. It is important to note that AF CDC was not held in Period 13 as stated by</p>
-----------------------------------	---	---

Appendix – CRL Response to Period 1 PRep Report

<p>holding its Period 1 AFCDC at ██████, as it did in Period 13, while a review of scope, schedule, risk and resource is being undertaken to underpin PBU v1.2. Neither a QCRA nor QSRA has been undertaken during this period. However, CRL expects to present an updated AFCDC in Period 2, ahead of the finalisation of PBU v1.2.</p> <p>While we support the CRL strategy to hold its forecast for a period as it progresses schedule development, we are concerned that CRL is proposing to present its cost forecasts before this work is complete. We believe that there will be uncertainty in the forecast while schedule development continues. Until the drivers of cost are fully identified, the AFCDC cannot be reliably underpinned or be given any view of assurance.</p> <p>In Period 13, CRL proposed an AFCDC of ██████, with ██████ of AFC increases reported by projects, partially offset by ██████ of approved offsets. CRL reports that these were approved via drawdown papers through change control. However, the change papers appear to be retrospective rather than providing guidance, direction and control; they also suggest that delivery decisions focussed on target dates are driving priority.</p>	<p>the Project Representative, the AFCDC was updated to reflect the emerging position. The AFCDC was held in Period 1 to allow the focus on underpinning activities to ensure a live picture of the AFCDC continues to be reported. There will be a Period 2 update which will incorporate some outputs from cost and risk activities currently underway and a further update will incorporate all outputs with full alignment to a completed Programme Baseline 1.2.</p> <p>CRL is pleased that the Project Representative supports the decision to hold the AFCDC in Period 1 whilst critical cost and risk activities are undertaken alongside those for scope and schedule. Whilst there are specific activities challenging assumptions over cost and risk, the AFCDC remains an output of cost and schedule and the work to develop the Programme Baseline 1.2 remains aligned. There will be an updated AFCDC in Period 2 that will incorporate some of the emerging picture. Actions and activities continue, and a further update will remain aligned to the timings of the Programme Baseline 1.2.</p> <p>Period 13 saw a cost increase of ██████ coming through Project forecasts. This increase was partially offset by ██████ of approved drawdowns where the Change Paper was presented and approved in line with change control governance. An emerging AFCDC was presented at the periodic EPPR meeting for Executive review and discussion. This included the recommended use of specific identified provisions to provide some further offset to the project cost increases. The</p>	
---	--	--

Appendix – CRL Response to Period 1 PRep Report

	<p>The impact of CRL's cost review and challenge last period reduced the cost pressures to █████, but this continues to be excluded from the reported AFDC. We expect the cost challenge exercise to continue in parallel with the development of PBU v1.2, such that all cost elements will be included in future reported period AFDC figures. However, a significant</p>	<p>decision was taken to continue with the strategy to rebuild our unknown unknown reserves with █████ of identified savings retained and transferred in Period 13. This decision led to the final AFDC of █████. The programme has introduced the Programme Change Panel which is developing its capability to take feeds of emerging pressures in the PRISM system to review for formative steer. Delivery decisions are being taken, generally, to achieve the objective of delivering works at the earliest and safest possible time. The earliest and safest time is articulated within CRL's control systems in the Deterministic schedule which is the target. With schedule being the principle driver of cost, this is an important control mechanism but the interface between the Deterministic and P50 schedules needs to be an accompanying part of this conversation. The majority of decisions can be tied back to achieving milestones that have both Target (Deterministic) and P50 dates – this is an expected principle and by driving to the Deterministic there is reduced risk of complacency. However, it is recognised the need to arrive at decisions informed by cost/benefit analysis.</p> <p>The cost challenge continues and remains a key part of the cost and risk activities underway. The pressures identified previously are incorporated into the scope book reviews and this remains a joint exercise in the development of the Programme Baseline 1.2. The █████ at Period 13 is a gross cost pressure and has yet to be offset against specifically held risk and provisions.</p>
--	---	---

Appendix – CRL Response to Period 1 PRep Report

<p>Organisation</p>	<p>number of additional and, as yet, un-costed scope items has been identified, which may exert further cost pressure.</p> <p>With the AFCDC held in Period 1 and the cost pressures excluded from this forecast, CRL will need to recover [REDACTED], in order to out-turn within the [REDACTED] funding package. To be successful, CRL will need to achieve all its risk mitigations and/or scope reductions. We are concerned that by focussing on delivery to meet target dates, CRL may consume its risk allowances in mitigation, such that the target dates may be met, but spending to [REDACTED].</p> <p>In Period 13, CRL’s Workforce Planning Group processed more than 200 change requests for resources against its Workforce Plan; [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] While the impact of roles yet to be filled is under review by CRL, this may offer an opportunity for a saving of approximately [REDACTED], which could be made available to transfer to scope in PBUv1.2. However, given that the Workforce Plan is based on Deterministic dates, there are likely to be further cost pressures due to the extension of roles to align with P50 schedule dates.</p>	<p>Delivering on or as close to our deterministic programme remains the single biggest financial opportunity. Working towards and with decisions made utilising financial implications will continue to drive towards the best possible outcome.</p> <p>Of the changes processed, 24% were [REDACTED] and all were funded from transfers within the Indirect budget as the Project Representative has accurately stated. The [REDACTED] quoted relates to roles that were included in the Workforce Plan with start dates that have now passed yet recruitment has not commenced. CRL is conducting an exercise to review all vacant roles; not just those with historical start dates. This may offer an opportunity for savings; however, this has not yet been calculated. CRL would anticipate that further cost pressures due to any extension of roles to align with P50 schedule dates would be funded through a drawdown of prolongation risk.</p>
----------------------------	--	--

Appendix – CRL Response to Period 1 PRep Report

<p>Stage 3 Trial Running, Trial Operations and Passenger Service</p>	<p>The ramp-down of the site workforce, that was expected as stations and shafts are handed-over, has not significantly materialised so far. Site resources have ranged through approximately 2,500 in Period 9, 2,000 in Period 11, and 2,400 in Period 1.</p> <p>Transition into ROGS was achieved on time on 27 March 2021, but only because RfLI was able to develop, at a late stage, an acceptable plan for maintenance regularisation (i.e. Maintenance Bridging Works). However, the Maintenance Bridging Works and residual Programme scope planned for completion during the initial [REDACTED] Controlled Introduction Period has beset an organisation which is sized and structured for 'the steady state', and has magnified previously-identified concerns of the RfLI Rule Book for the current phase of the railway. This has resulted in a [REDACTED] delay to the deterministic start date for 4 TPH trials, achieved on 10 May 2021. Although 4 TPH trials have started, RfLI's priority must be to bring stability to the new operating railway environment; the establishment of robust</p>	<p>The curve of demobilisation may not be as steep as originally envisaged, but a notable ramp-down in resources between February 2021 and April 2021 has been achieved on the projects where such as reduction was required as shown below:</p> <ul style="list-style-type: none"> • Routeway contracts where the assets have been largely taken over, Platform Screen Doors and Routeway, where the resource have reduced by 20-28%, • Stations projects that have been handed over such as Farringdon and Tottenham Court Road stations, resources have been reduced by 17-30%, • Projects nearing physical completion such as the Shafts and Whitechapel station, resources have reduced by 12-14%. <p>The [REDACTED] period between transitioning to a ROGS environment, entry into Trial Running and the commencement of 4TPH has provided invaluable experience and learning for both the Operator and CRL. This experience and learning is being used to refine and improve the RFLI Rule Book and processes and procedures in a passenger free environment. Critical Maintenance Bridging Works were sufficiently completed in order for the RFLI ITAP panel to authorise 4TPH on the Crossrail Central Operating Section. Outstanding Maintenance Bridge Works are being discussed as part of weekly Passenger Service Steering Group (PSSG) meetings. CRL & RFLI continue to refine the scope to be completed during Trial Running including what</p>
---	---	---

Appendix – CRL Response to Period 1 PRep Report

	<p>and clear processes under the control of resources fully familiar with the system must take precedence over the gathering of train performance metrics.</p> <p>In the period, difficulties with control and implementation of railway access has been the main threat to Programme delivery. An independent review has been undertaken that has identified 20 improvement recommendations, including the establishment of a single integrated controlling body reporting to RfLI's COO. This is expected to provide a co-ordinated approach to access control, with consistent procedures and improved communication between parties (i.e. RfLI, CRL and the supply chain). Time will be required to implement fully the improvement plan, but it is expected some short-term wins can be realised to re-start station works.</p> <p>From Period 2, PSSG will report on the performance metrics of 10 selected workstreams, split between CRL and RfLI, that are required for entry into Trial Operations. Issues that are vital to delivery are to be escalated from the PSSG forum to executive leadership for intervention, if necessary. Delivery of reliability growth and assurance, and the Trial Running Staging Plan, are important workstreams for incorporation into PBU v1.2.</p> <p>The constraints imposed on the schedule for entry into Trial Operations make it impossible to satisfy all stakeholders. A change in strategy</p>	<p>can be accommodated by the responsible Contractor, ATC, within the Blockade.</p> <p>CRL agrees with the Project Representative's comment regarding the main threat to Programme delivery is currently access. In response, CRL has appointed a Lead to oversee a single integrated Access Control Unit to manage all access requirements for RfLI and Crossrail. This includes but is not limited to programme delivery and maintenance and operations. Additionally, the Access Improvement Implementation Project (AIIP) workstream progress is discussed weekly covering process improvement, review of resources, data and information, secure room access and communications.</p> <p>The Project Representative is accurate to state from Period 2, PSSG will report on ten selected workstreams split between CRL and RFLI for Trial Operations readiness and reporting key issues to the Executive team. These reports are a matter of weekly record. CRL concurs with the Project Representative that Reliability, Assurance, and Trial Running Staging Plan are important components of the Programme Baseline1.2.</p> <p>Whilst the Programme Baseline1.2 exercise is being finalised, the programme continues to use the agreed scope and logic within the current</p>
--	--	--

Appendix – CRL Response to Period 1 PRep Report

	<p>from the single August 2021 Blockade, to two smaller blockades in July and August 2021, highlight CRL’s difficulties. Completion of the remaining PMSE (Project, Maintenance, Snagging and Enhancements) works for routeway and stations and completion of assurance must be balanced against achieving mileage growth, train and system testing and operations trials. RfLI’s need to complete significant residual Maintenance Bridging Works, emergency maintenance and routine works, while reducing the conflict with CRL’s PMSE activities, are important planning considerations. MTREL’s requirement for FLU access to Old Oak Common Depot from the GEML, and its ability to provide drivers to support 24-hour work patterns, must also be considered.</p> <p>Consequently, the schedule up to Trial Operations is heavily congested and contains no float. The emerging schedule pressures on ELR100 delivery continue to pose a threat to the August 2021 Blockade and the overall schedule. Without contingency factored into the Trial Running Staging Plan, the target date of [REDACTED] for entry into Trial Operations is unrealistic. A risk assessment against the planning dates is also required to validate the P50 date for Trial Operations and Passenger Service.</p> <p>Initial indications suggest that 12 TPH trials will start in mid-July 2021, later than originally planned; its duration is currently based upon the minimum required number of days operation. FLU reliability mileage is currently down 53%</p>	<p>DCS1.1. As mentioned previously, the areas of concern, particularly the estimated delays to commissioning the ELR100 software that may impact on entry into Trial Operations as currently planned are being assessed in light of Trial Operations’ dependency on the commissioning of ELR100 and Revenue Service’s dependency on Trial Operations. This will be a key pressure point on the Deterministic DCS1.1 Baseline. The results and mitigations to minimise any emerging impacts will be shared with the Executive team who will decide upon the overarching strategy and Block Plan for the Programme Baseline 1.2.</p> <p>The proposed Trial Running Staging Strategy update indicates that timetable running at 12TPH will commence on [REDACTED] July 2021. The Reliability Dashboard has been developed and discussed on a weekly basis as part of PSSG meetings.</p>
--	--	--

Appendix – CRL Response to Period 1 PRep Report

<p>Stations Commissioning and Handover</p>	<p>against DCS v1.1; emerging unforeseen issues during the Trial Running period are likely to further threaten mileage growth.</p> <p>The deployment of signalling software PR7 in early May 2021 has brought improved reliability, and 4 TPH trials are able to proceed with many operational restrictions removed.</p> <p>The [REDACTED] target date for entry into Stage 3 Passenger Service is unlikely to change, even when PBU v1.2 is fully developed and approved. With key stakeholders required to commit to the [REDACTED] date, compromises will be necessary (e.g. operational restrictions) to facilitate achievement of the target date.</p> <p>Stations progress has been hindered by difficulties with access. Changes to access management processes for RfLI secure rooms on stations have added a further 2 weeks of delay to slippage previously identified and will be challenging to recover. Additionally, suspension of all TVS works across the Central Section has been necessary following a serious HPNM incident at Bond Street Station and, until the root cause has been identified and improvement measures put in place, additional delays are</p>	<p>CRL agrees with the Project Representative's assessment of the improved reliability brought about by the deployment of the signalling software, PR7, which took place in May 2021.</p> <p>This will be a key consideration in the development of the Programme Baseline 1.2. All the lessons learned in achieving ROGS in a timely fashion facilitated by the current logic underpinning the DCS1.1 schedule will be integral to the revised schedule considerations and will also include the assessment of the latest forecast dates for commissioning ELR100 from Siemens. The Programme Baseline 1.2 will be formally presented to the CRL Executive team and ELDG once full analysis and LOD assurance has been completed.</p> <p>The Tunnel Ventilation System (TVS) and access issues are being addressed as the project progresses. The works, although desirable to achieve in advance of the June Blockade is still supportive of the programme by utilising the Blockade to complete any residual works in the TVS. There is now an agreed process to inspect and access RFLI rooms for compliance as needed.</p>
---	--	---

Appendix – CRL Response to Period 1 PRep Report

Assurance	<p>likely. A review of the Integrated Access Plan is expected to identify improvements to existing processes, but a pragmatic approach will be necessary in the meantime.</p> <p>Achievement of SC2 and SC3 ROGS for Trial Operations, respectively, at Bond Street and Canary Wharf Stations, continues to be a concern. Liverpool Street and Woolwich Stations are the next due for handover, but the recent difficulties with access have reduced to zero the schedule float to BIU.</p> <p>While three stations have been successfully handed over by their forecast Deterministic dates, the compromises necessary to achieve these milestones mean there remains deferred work to complete during the T+ period, before they can become fully operational.</p> <p>Completion of the Maintenance Bridging Works plan was a pre-requisite to the start of 4 TPH trials. However, poor progress resulted in the adoption of a risk-based rather than an evidence-based approach to TRRAC acceptance by ITAP. SC3 ROGS date. Delays arising from frustrated access at stations are unlikely to be recovered.</p>	<p>BIU at Woolwich and Liverpool Street stations are holding their planned dates. Delivery of Asset data is the only issue that requires a pragmatic approach. CRL and RFLI are working on that approach to support the programme's goal of SC3ROGS. Canary Wharf and Bond Street stations have been impacted, nevertheless, they are maintaining their [REDACTED] handover dates and will not impact on Trial Operations.</p> <p>The Project Representative is correct to state three central section Stations have been handed over in line with their deterministic planned dates and the deferred works will be completed at a later date which has always been part of the planned schedule. There are specific activities that fall beyond SC3ROGS as a matter of inevitability. However, all required works supporting Trial Operations and Revenue Service are planned to be complete in readiness for the aforementioned phases.</p> <p>The plan agreed before the SCROGS milestone was achieved included update of the TRRAC with further risk-based evidence to support completion of the Controlled Introduction Period and start of the 4TPH timetabled Trial Running phase. This was the approach followed and the updated TRRAC and corresponding CESAC were accepted at ITAP.</p>
------------------	--	---

Appendix – CRL Response to Period 1 PRep Report

	<p>Workshops have been undertaken to streamline safety assurance delivery and provide greater certainty of achieving target dates; however, existing processes are well established, and there is limited opportunity to change. Concurrency of assurance delivery in the periods leading up to Trial Operations adds further risk to successful achievement. This includes at Paddington, Canary Wharf, Bond Street and Whitechapel Stations, and in Rail Systems (e.g. Signalling, TVS, PSD and Communications and Control). The volume of activities associated with RAM demonstrations and compliance reporting prior to station handovers is also concerning. There is also a concern about the level of resources available to deliver the current plan. CRL's blockade strategy will be important to facilitate the earliest and efficient processing of information required to complete the assurance activities prior to the start of Trial Operations.</p> <p>The StEJ process that supported transition into ROGS will not be widely available to CRL for Trial Operations readiness. A right-first-time approach will be crucial to expedite the assurance process, and the incorporation of past learning will be valuable underpinning to PBU v1.2. CRL's adherence to the delivery plan will be important to allow RfLI to meet its obligations on safety assurance leading to Trial Operations.</p>	<p>CRL agrees with the Project Representatives comments in the period. The same approach to railway level assurance will be applied for Entry into Trial Operations (EiTO) as was successfully applied for Entry into Trial Running (EiTR). However, this will be implemented to a more complete Crossrail Central Operating Section railway following the activities on Routeway and Stations during Trial Running phase and the planned Blockades. The level of resources to support the assurance process is being considered as part of the Programme Baseline1.2 planning exercise. The potential for specific delays to cause concurrency pressures to the programme is also a recognised programme risk that will be managed.</p> <p>A focus on improving the ability to achieve Right First-Time assurance inputs has been part of the Programme Baseline1.2 planning initiatives. The lessons learnt from assuring EiTR have been applied to the EiTO assurance planning. The use of StEJ process continues to apply to stations reaching SC3ROGS status and will be applied to the remaining SJ dependencies to achieve EiTO on a risk basis as appropriate.</p>
--	--	--

Appendix – CRL Response to Period 1 PRep Report

<p>Future Stages</p>	<p>The Stage 4A timetable was implemented on 16 May 2021, and infrastructure works to support FLU operations have been completed. FLUs were not in passenger service at the start of the timetable change, as there was uncertainty whether the Central Section would be available at the date when a commitment to starting the service was needed. With FLUs planned to start passenger services on 25 May 2021, the fleet available to support the service is currently limited to between 4 and 6, with a mixture of RLUs and Class 315 trains, until the completion of the August 2021 Blockade. From that point, there will be a rapid transition to a full FLU fleet.</p> <p>The proposed replacement of [REDACTED] is currently under review. Evaluation of the risks and benefits of [REDACTED] will need to validate that there is not an unacceptable risk to the delivery of Elizabeth Line and main line timetable operations, when implemented.</p>	<p>The Project Representative is accurate that the Stage 4A timetable was implemented on 16 May 2021, and infrastructure works to support FLU operations have been completed. The Project Representative is correct that FLUs were not in passenger service at the start of the timetable change as there was uncertainty whether the Central Section would be available. This was for transit movements to and from Old Oak Common Depot at the date when a commitment to starting the service was needed.</p> <p>FLUs commenced passenger services on 26 May 2021, the fleet available to support the service is currently limited to between three and six, with a mixture of RLUs and Class 315 trains, until the completion of the August 2021 Blockade. From that point, there will be a rapid transition to a full FLU fleet.</p> <p>[REDACTED] will see the peak frequency rise in the Central Operating Section from 12TPH to 24TPH; similar to the ramp up configuration of [REDACTED]. [REDACTED] does not involve any changes to service levels on the National Rail network and has been designed to be able to be implemented outside of a National Rail timetable change date. This design structure offers more flexibility to ensure that the infrastructure, rolling stock and drivers are ready to support the step up in service.</p>
-----------------------------	---	---