

## Project Representative Report

**Item: Project Status Report 160 and Crossrail  
Response Period 11 FY2021-22**

**Date: Period 11 (8 January 2022 - 4 February 2022 )**

---

### 1 Overview

- 1.1 The P-Rep is in place to provide the Sponsors, TfL and the Department for Transport, with oversight of project delivery, advise and raise points of challenge to the Sponsors and scrutinise progress.
- 1.2 The P-Rep observations are shared with Crossrail and are discussed in detail by Crossrail, P-Rep and the Commissioner. Crossrail then produces a written response to the P-Rep report.
- 1.3 In line with the commitments made by the Mayor for greater transparency of the Crossrail project, please find below the latest P-Rep Sponsor Summary and Crossrail's Management Response.
- 1.4 It has been necessary to make some redactions to the reports prior to publication to protect commercially sensitive material. We have sought to keep such redactions to a minimum

### 2 Contents

1	Crossrail response on the Project Representative Sponsor Summary Report Period 11 FY2021-22 .....	2
2	Project Status Report 160 Period 11 FY2021-22 .....	17



Crossrail Limited  
5 Endeavour Square  
London E20 1JN  
T: 0343 222 0000  
Helpdesk  
T: 0345 602 3813  
[www.crossrail.co.uk](http://www.crossrail.co.uk)

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

11 March 2022

Dear ██████████

**Re: Crossrail PRep Project Status Report 160 – Period 11**

I am writing in response to the PRep Sponsor Summary cover letter for Period 11.

As noted in my previous letter, Trial Operations Phase 2 commenced on 29 January 2022. In addition to the two mass evacuation exercises that I mentioned previously, we have conducted a further two trials. The first exercise took place at Woolwich station on 26 February 2022 and was conducted in two parts: evacuating a train in the tunnel to rescue a train in the opposing tunnel and via the emergency access at Limmo. The second trial exercise involving up to 1000 volunteers was conducted over the weekend of 5 March 2022 at Canary Wharf station.

Both trial exercises were given a conditional pass. Any identified process improvements have been taken forward as actions to provide clear and specific guidance to the teams and our RFLI, MTREL, LUL colleagues in response to targeted scenarios. One trial exercise remains. This is a 24TPH demonstration and will ensure processes and systems are in the best shape as we approach Revenue Service. Reliability continues to steadily improve with the railway's performance reaching levels of 95% PPM in recent weeks. Nevertheless, there is still much to do to make this consistent.

With countdown to commence Stage 3 Passenger Service underway, we remain focussed on Stage 3 Revenue Service Assured Railway (Ready for Railway Service) on ████████ March 2022. This is very intense workload, and we are making good progress, however, this must be correct and at the right level of completion. There are no changes to the commencement of Revenue Service which remains within the first half of 2022.

You are correct to point out that resolutions regarding Auto-Reverse have taken longer than expected. Reviews are underway to evaluate the best option and I am confident a timely decision will be made to meet the Stage opening schedules.

**MOVING LONDON FORWARD**





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 11 PRep Report

Programme Response Category	PRep Period 11 Sponsor Summary Content	CRL Period 11 Response
<p><b>Headlines: Progress and Look Ahead</b></p>	<p>The safety case for entry into Trial Operations Phase 2 was accepted by ITAP on 28 January 2022. This allowed Phase 2 exercises involving larger numbers of participants than previously permitted to be carried out. The first of the internal exercises (i.e. not utilising members of the public) took place on 29 January 2022, and they have continued into February 2022. The first mass evacuation exercise was carried out on 13 February 2022 and achieved a conditional 'pass'. The various scenarios tested so far have highlighted shortcomings in process, organisation, and communications, and provided valuable learning for the later exercises.</p> <p>Trial Operations exercises and timetable running are being undertaken on a railway which is still not delivering the levels of reliability which might be expected at this stage of delivery. As a result, staff workloads are increased by the need to manage unexpected events, and the planned course of exercises is sometimes interrupted, compounding the disruption. While RfLI remains generally optimistic about reliability improvement, the data suggests a downward trend in performance. A series of forums has been established to identify, review, and mitigate the issues which have the most significant impact upon reliability. The main objectives are to confirm the underlying factors associated with</p>	<p>Agree. Entry into Trial Operations Phase 2 was achieved as planned on 29 January 2022. The three mass evacuation trials that have taken place on 13, 19 and 26 February 2022 were deemed a "pass" with comments. Any identified process improvements have been taken forward as actions. A fortnightly lessons learnt newsletter is circulated to our colleagues in RfLI, MTREL, LUL which contains targeted lessons learnt from previous exercises. Where relevant these are joined by briefing notes to provide clear and specific guidance to teams in response to particular scenarios.</p> <p>A Revised Establishment Competency plan is in place to build to 32 TMs by [REDACTED] with further recruitment underway.</p> <p>Generally, the railway performance has improved since H5.4 (ELR110, TCMS 7.6.5.3 and ETCS 6.9.1) was uploaded. Improvements continue with rollout of H5.6 achieving over 95% PPM performance on many occasions and reduction in 15-minute delays. Further improvements are expected over the period to [REDACTED] from H5.7 and Viper 3 updates. These will address HDMI and head code issues. Furthermore, ELR200 and ELR210 are expected to address timetable loading, TTP failures, 'ready to depart' and other issues.</p>

## Appendix – CRL Response to Period 11 PRep Report

	<p>the negative performance trend and to identify the mitigation measures to allow the required performance levels to be achieved. Currently, the top five reliability issues are: miscellaneous train specific items; signalling transition at Stratford Station; PSDs; Yellow Plant; and ETCS<sub>2</sub>.</p> <p>CRL continues to detail the schedule, risk, and cost assessment for the plan to complete Bond Street Station. It is now expected that this will be presented at the ELDG meeting in early March 2022. Further emerging pressures are building on Canary Wharf Station in relation to scope growth for both pre- and post-passenger service opening; this is a concern because we would expect all scope to have been fully identified at this late stage.</p> <p>CRL and RfLI now plan for ITAP acceptance of all safety assurance and securing of the ORR Authority to Place into Service (APIS) by March 2022, although this will be challenging. A substantial assurance workload remains, with a significant number of EOWs, SJ Dependencies and other conditions currently still open. Evidence of closure will allow the uplift of the SJs, readiness statements, formal risk declarations, and top-level safety submissions, which previously supported Trial Operations, to Passenger Service status.</p> <p>Some slippages of the safety assured date for passenger service can be tolerated, because Stage 3 opening will now only take place once</p>	<p>The position of Bond Street station will be presented at the ELDG session scheduled for March 2022. However, reviews with the TfL Commissioner are expected prior to then. At Canary Wharf station, scope has been identified and clarity on safety as well as revenue service requirements are still being agreed.</p> <p>The assurance milestone for March 2022 is to de-risk the eventual railway assurance to support Stage 3A Passenger Service. The final APIS is expected to be received from the ORR after this date but all submissions are to be produced and submitted to the ORR by that date. CRL agrees that this is a challenging stretch target for the joint CRL and RFLI assurance to achieve.</p> <p>Agree. The Programme is targeting and making best endeavours to achieve Stage 3 Revenue Service Assured Railway (ready for Railway</p>
--	--	---

## Appendix – CRL Response to Period 11 PRep Report

	<p>the remaining rail systems works have been completed; these include the deployment of ELR200 during the Easter 2022 blockade. These residual works are scheduled through the first half of April 2022 and are intended to deliver the final reliability improvements necessary to allow entry into passenger service. [REDACTED]</p> <p>[REDACTED] which provides for a period of non-passenger operation to confirm that the improvements have been delivered, and to resolve any post- ELR200 teething problems. The corresponding P80 date remains within the declared opening window of the first half of 2022.</p> <p>The deterministic start of Stage 5B has slipped to [REDACTED] because it is taking longer than expected to address Auto-Reverse functionality issues. In order to mitigate this and allow passenger services between the NR surface sections and the Central Section to start in [REDACTED] 2022, RfLI proposes to introduce Stage 5B Minus; this is intended to provide a service frequency of up to 22 TPH and avoid the need for the Auto-Reverse functionality. The critical link to the timescales for timetable bidding has resulted in the Stage 5C deterministic date moving from [REDACTED] December 2022 to [REDACTED] May 2023.</p>	<p>Service) on the [REDACTED] March 2022. Commencement of Revenue Service remains within the first half of 2022.</p> <p>Agree.</p>
--	--	--

## Appendix – CRL Response to Period 11 PRep Report

	<p>Sponsors' particular attention is drawn to the following:</p> <p>CRL and RfLI have committed to complete safety assurance activities and secure an APIS on █ March 2022, but delivery of supporting documentation will be challenging.</p> <p>Railway reliability remains below expectation and CRL/RfLI concern remains with the limited schedule opportunity for growth. █</p> <p>Bond Street Station delivery completion remains uncertain, with baseline schedule, costs and risks to passenger opening still to be finalised by CRL.</p> <p>The revised target date for Stage 3 opening marks the schedule opportunity boundary for RfLI and MTREL to complete their practical readiness preparations.</p>	<p>CRL responds to the Sponsors as follows:</p> <p>As mentioned previously, the submissions to the ORR for APIS are to be completed by █ March 2022. This requires the supporting safety assurance which is an achievable challenge.</p> <p>As mentioned previously, railway performance has generally improved since H5.4 (ELR110, TCMS 7.6.5.3 and ETCS 6.9.1) has been uploaded and continues to improve with rollout of H5.6. Subsequently, there have been many occasions where 95% PPM performance and reduction in 15 mins delays have been achieved. Further improvements are anticipated over the period to █ from H5.7 and Viper 3 updates addressing HDMI and head code issues. ELR200 and ELR210 are set to address timetable loading, TTP failures, 'ready to depart' and other issues.</p> <p>The baseline programme is ready to for final review with options to mitigate standard processes to drive better schedule and cost savings.</p> <p>Agree.</p>
--	--	--

## Appendix – CRL Response to Period 11 PRep Report

	<p>Stage 5B Minus potentially allows the start of Central Section through services in [REDACTED] 2022, but Stage 5C is now driven to May 2023 to accommodate timetable bidding.</p>	<p>Agree.</p>
<p><b>Health &amp; Safety</b></p>	<p>In Period 11, CRL reported one Lost Time Incident at Bond Street Station and one High Potential Near Miss at Canary Wharf Station. Overall safety indicators remain within those set by the Programme. CRL and RfLI continue to implement measures to protect the Programme from Covid, with a focus on achieving Elizabeth Line passenger service.</p>	<p>CRL record Lost Time Cases (LTCs) not lost time incidents. LTCs include occupational illness from working on the Programme, whereas Lost Time Incidents do not.</p> <p>The Programme continues to manage the coronavirus pandemic risk. Measures implemented by the supply chain remain available at short notice should there be a change to the risk profile and data.</p>
<p><b>Programme Overview:</b>  <b>Schedule</b></p>	<p>The target date for completing all safety assurance activities and securing an APIS from the ORR is [REDACTED] March 2022. A Timetable Demonstration period will follow, during which signalling, rolling stock, TVS, and communications and control systems software upgrades will be implemented; these works are expected to facilitate an increase in overall reliability. The main risk to this date is the completion of the Technical Files and the issuing of the APIS by the ORR.</p>	<p>Submissions to the ORR for APIS are to be completed by [REDACTED] March 2022 [REDACTED]</p> <p>[REDACTED] This lies alongside the time for the reliability enhancement works noted and subsequent confirmation of reliability to enter Passenger Service from the timetable demonstration period.</p>

## Appendix – CRL Response to Period 11 PRep Report

	<p>[REDACTED], and the main risk to entering passenger service is failure to achieve the required level of overall system reliability and resilience. The P80 date for the start of Stage 3 Passenger Service remains within the first half of 2022 opening window.</p> <p>Delays in the completion of workstreams supporting the delivery of Auto-Reverse functionality, which is required for running a 24 TPH service, have resulted in slippage to Stage 5B to [REDACTED] 2022. To maintain the previous forecast, start date of [REDACTED] 2022, CRL and RfLI are exploring the possible introduction of a modified stage, known as Stage 5B Minus, which will include a service frequency of up to 22 TPH, without Auto-Reverse functionality. This will be considered as part of DCS v1.3 schedule development and a commitment decision is expected to be made during Period 12.</p> <p>The potential delay to Stage 5B has impacted the forecast date for Stage 5C; start of service is now driven out in the schedule to the next national timetable change in May 2023.</p> <p>Achievements during Period 11 have included enactment of SC2 at Bond Street Station, the start of Trial Operations Phase 2, the approval of H5.6 rolling stock software and the upload of CMS software version 4.28.1.</p>	<p>Agree. As mentioned above performance of the railway has improved with updates to software drops with further improvements expected over the coming period to [REDACTED]. Many days have achieved over 95% PPM performance and reduction in 15 mins delays.</p> <p>Agree.</p> <p>Agree.</p> <p>Agree. Also, three mass evacuation trials have taken place on 13, 19 and 26 February 2022. Farringdon, Liverpool Street and Tottenham Court Road stations achieved full handover completion to London Underground.</p>
--	--	--

## Appendix – CRL Response to Period 11 PRep Report

<p><b>Commercial and Risk</b></p>	<p>For Period 10, CRL reported a confirmed P50 AFCDC at £15,963m, which was a [REDACTED] increase on its earlier reported draft P50 AFCDC of [REDACTED]. This increase was attributed to the reversal of the [REDACTED] Scope Gap cost opportunity included in the draft forecast, and a revised offset of risk provisions associated with the early signs of Bond Street Station cost pressures.</p> <p>At Period 11, CRL is reporting a draft P50 AFCDC of [REDACTED], which is a reduction of [REDACTED]4. Overall, there was a [REDACTED] increase in the period, potentially offset by a [REDACTED] drawdown from CRL's risk provisions. Indirect Costs have increased significantly, with CRL reporting a [REDACTED] increase in CTG following the February 2022 workforce planning review, supporting a [REDACTED] BIU date for Bond Street Station; this is subject to ELDG endorsement. In the period, CRL has carried out a review of its Scope Gap allowances and has made positive efforts to transfer items to the COO reserve and to risk provisions, where appropriate.</p> <p>CRL has recognised the significant challenge in pursuing delivery of the Programme against the £825m funding package and is presently considering a revised funding threshold. [REDACTED]</p>	<p>The cost pressure on Bond Street station noted in Period 9 and Period 10 could not be offset with current risk and provisions. Therefore, it was deemed prudent to recognise the full increase to the AFCDC in Period 10.</p> <p>Agree. The final Period 11 AFCDC was £15,963m, unchanged from P10.</p> <p>The final Period 11 AFCDC was £15,963m, £174m above the £825m, £101m under the £1.1bn funding limit. In the period, a bottom-up budget exercise was undertaken to support a revised funding target.</p>
-----------------------------------	---	---



## Appendix – CRL Response to Period 11 PRep Report

	<p>are taking place on a railway which is not in its final configuration and is performing unreliably. This is not an ideal operating environment, and there is a risk that staff workloads are increased by the need to manage unplanned events, and that exercises are compounding perturbation.</p> <p>Reliability continues to be variable and currently does not meet the criteria originally required for entry into Trial Operations Phase 2. An example is Public Performance Measurement (PPM), with the threshold for entry into Trial Operations Phase 2 of 90%, but the actual level is currently at approximately 85%; 95% PPM is required for the start of passenger service. The causes of underperformance are train reliability, signalling faults, staff systems, organisational familiarity, and Platform Screen Doors; improvement workstreams are underway in each of these areas. Hardware and software upgrades will be deployed on rolling stock by the end of March 2022, signalling upgrade ELR200 will be implemented during the Easter 2022 Blockade and RfLI is carrying out a Process Improvement Programme. The objective of RfLI's work is to rectify processes that appear to hinder smooth operations or that extend perturbation disruption. RfLI is also carrying out a resilience review of assets other than rolling stock and signalling, to provide an additional layer of reliability during the first 100 days of passenger operation.</p>	<p>process improvements have been taken forward as actions. A revised fortnightly-lessons learnt newsletter is also circulated to our RFLI, MTREL and LUL colleagues containing targeted lessons learnt from previous exercises. Where relevant these are supported by briefing notes to provide clear and specific guidance to teams in response to particular scenarios.</p> <p>Agree. Performance generally has been much better since H5.4 (ELR110, TCMS 7.6.5.3 &amp; ETCS 6.9.1) has been uploaded and continues to improve with rollout of H5.6 and many days achieving over 95% PPM performance as well as reduction in 15 mins delays. There will be further improvements over the period to [REDACTED] from H5.7 and Viper 3 updates addressing HDMI and head code issues as well as ELR200 and ELR210 addressing timetable loading, TTP failures, ready to depart and other issues. The Programme is targeting and making best endeavours to achieve Stage 3 Revenue Service Assured Railway (ready for Railway Service) on the [REDACTED] March 2022. Commencement of Revenue Service remains within the first half of 2022.</p>
--	--	--

## Appendix – CRL Response to Period 11 PRep Report

<p><b>Stations Commissioning and Handover</b></p>	<p>The difficulties and uncertainties in delivering the required reliability for passenger service is significant. [REDACTED]</p> <p>[REDACTED] Even with this additional time, achievement of the required reliability performance will remain challenging.</p> <p>Canary Wharf Station BIU was achieved on 21 January 2022. CRL continues to close out SJ Dependencies and EOWLS to align with the deterministic target date for safety assurance acceptance by ITAP of [REDACTED] March 2022.</p> <p>CRL achieved SC2 enactment at Bond Street Station on 17 January 2022. The BIU forecast date for both the Eastern and Western Ticket Halls at Bond Street Station is being held at [REDACTED], although is subject to confirmation at the next ELDG meeting.</p> <p>Slippage is reported in the closure of EOWLS at Whitechapel and Tottenham Court Road Stations, which CRL considers to be recoverable. CRL reports clearance of EOWLS at other stations as being on schedule.</p>	<p>As responded directly above.</p> <p>Close out of SJ dependencies and EOWLS at Canary Wharf station remains on target as planned.</p> <p>The BIU date for the Eastern and Western Ticket Halls at Bond Street station is still under review to evaluate the deterministic and best mitigated option.</p> <p>The reported EOWL slippages at Whitechapel station are back on plan to be completed by the end of [REDACTED] 2022. Tottenham Court Road station is now complete.</p>
---	---	--

## Appendix – CRL Response to Period 11 PRep Report

<p><b>Assurance</b></p>	<p>Completion of the remaining assurance is dependent upon the delivery of evidence of completed EOWLs and SJ Dependencies, Technical Files and SJs, and upon agreement between CRL and RfLI on system configurations and any necessary mitigations. CRL and RfLI will have to complete this work by early March 2022 to allow time for submissions to be made to ITAP and the ORR. This will be challenging, with both RfLI and CRL having already raised concerns over document quality and delays to the completion of reviews. This situation is similar to other key stages (e.g. Trial Running, Trial Operations Phases 1 and 2) except that there is limited opportunity to carry over any residual assurance workload into the passenger service period. Given that passenger service start-up is critically driven by reliability, any delay to the achievement of the full safety assured status on █ March 2022 will not necessarily have an impact upon █ █</p>	<p>Agree. The █ March 2022 assurance milestone provides a focus to help de-risk the Passenger Service date █. This remains a challenging stretch target for CRL and RfLI assurance teams. A key check point is the CESAC evidence freeze date of 4 March 2022 followed by the █ executive readiness review on 8 March 2022. The system configuration and any necessary mitigations will be agreed with all duty holders as appropriate (RFLI, MTREL, LU, NR).</p>
<p><b>Future Stages</b></p>	<p>RfLI and CRL have previously targeted the start of Stage 5B services on the deterministic date of █. However, ongoing uncertainty with the availability of Auto-Reverse functionality has resulted in the planned start date changing to the P50 date of █. This change has affected Stage 5C</p>	<p>Agree.</p>

## Appendix – CRL Response to Period 11 PRep Report

	<p>opening, which has moved from December 2022 to May 2023.</p> <p>RfLI still intends to connect the surface sections with the Central Section in [REDACTED] 2022 by operating a Stage 5B Minus service. This maintains the principles of services from the GWML terminating at Abbey Wood Station, and those from the GEML at Paddington Station. The peak service level will be 22 TPH (24 TPH for Stage 5B) and off-peak will be 16 TPH (20 TPH for Stage 5B). This approach is expected to provide additional driver resource and recovery time to compensate for the lack of Auto-Reverse. The decision to commit to Stage 5B Minus services in [REDACTED] 2022 needs to be made in [REDACTED] 2022, to enable driver rosters to be developed in time.</p> <p>Work is still being undertaken to understand the criteria needed to support that commitment decision (and subsequent stage decisions), with the focus upon reliability and delivery of scope. Enhanced reliability is anticipated through software upgrades to signalling (ELR210) and rolling stock (H5.7 and H5.8), and through continuous improvement of people and processes (RfLI RCC and response staff, MTREL drivers and Train Maintainers). However, opportunities for testing and reliability demonstrations will become more restricted once the railway enters passenger service. Programme scope will remain for delivery after Stage 3 opening and CRL and RfLI are</p>	<p>Agree.</p> <p>Agree.</p>
--	--	-----------------------------

## Appendix – CRL Response to Period 11 PRep Report

	<p>identifying the critical items pertaining to Stages 5B Minus, 5B and 5C.</p> <p>Our concerns last period about a Stage 5C opening in December 2022 were based upon the uncertainty of Auto-Reverse functionality being in place, the schedule proximity to Stage 5B opening and muted support from NR. The postponement of opening to May 2023 relieves these concerns, albeit at the expense of delaying overall programme completion.</p> <p>The revision of the Stage 5B and 5C opening dates is a pragmatic approach to managing the uncertainties of the later stages of the project. The introduction of a Stage 5B Minus also mitigates the delay in connecting the GE and GWML services with the Central Section. Nonetheless, we remain concerned at the poor rate of reliability growth, and the impact upon the implementation of Stages 5B Minus and 5B. Reliability must improve significantly over the next four periods to inform the commitment decision to Stage 5B Minus. This will be a challenge when management focus is likely to be on Stage 3 opening.</p>	<p>Agree.</p> <p>Agree.</p>
--	---	-----------------------------



**Crossrail Project Representative**

**Crossrail Joint Sponsor Team**

**Sponsor Summary**

**Project Status Report 160**

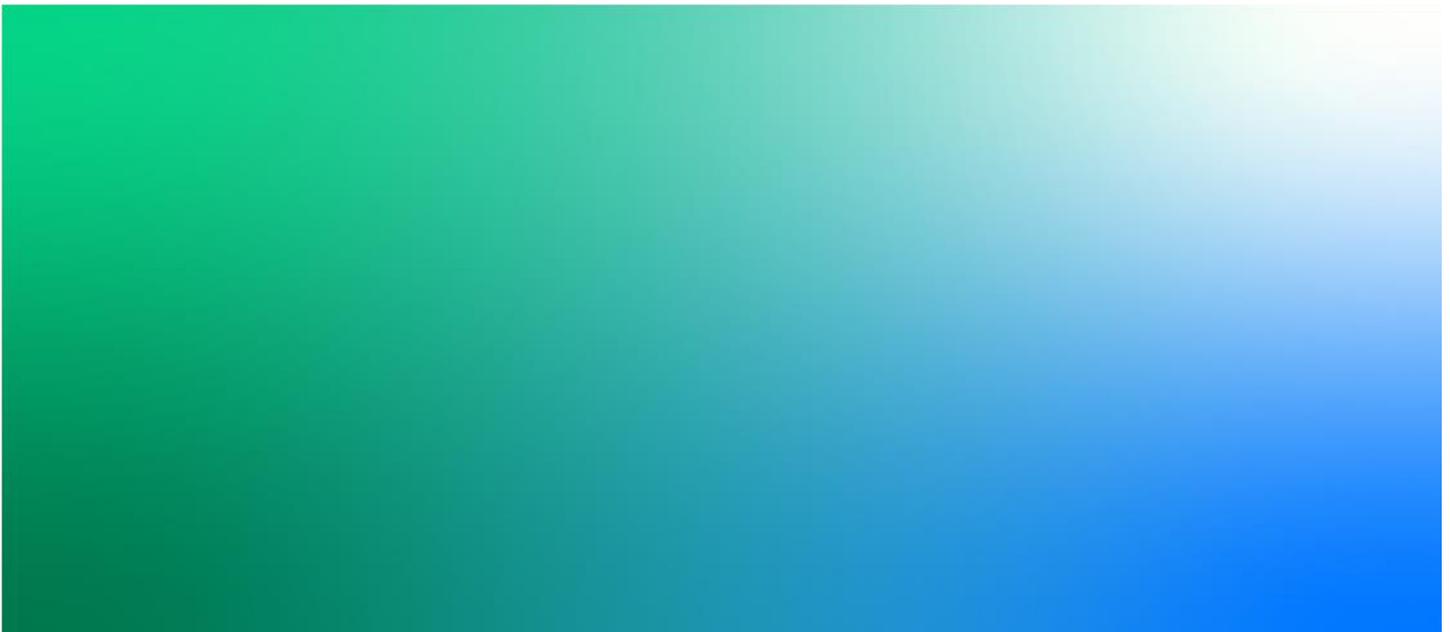
**Period 11 | FY2021/22**

**8 January 2022 –4 February 2022**

**Official – Sensitive Commercial**

**Document No: B2387600/160/1.14**

**4 March 2022**



## Sponsor Summary PSR 159

Project No: B2387600  
 Document Title: Sponsor Summary for PSR 160  
 Document No.: B2387600/160/1.14  
 Date: 4 March 2022  
 Client Name: Crossrail Joint Sponsor Team  
 Client No: RM 3730  
 Project Manager: [REDACTED]  
 Author: PRep Team

Jacobs U.K Limited  
 2<sup>nd</sup> Floor Cottons Centre  
 Cottons Lane  
 London SE1 2QG  
 England  
 Phone: +44 (0)203 980 2000  
 www.jacobs.com

© Copyright 2019 Jacobs U.K. Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This report has been prepared by Jacobs UK Ltd (Jacobs) pursuant to its contract (the Contract) entitled "TTW00033 Crossrail Project: Crossrail Joint Sponsor Project Representative" and dated 30 March 2020 with the Department for Transport (DfT) and Transport for London (TfL), DfT and TfL being the Clients. This report is prepared on behalf of, and for the exclusive use of the Clients and is subject to, and issued in accordance with, the provisions of the Contract. Jacobs neither has nor accepts any liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

Note: This report relies on the information set out in CRL's Period 11 reports augmented by more current information received by PRep during the course of our routine discussions with CRL since the Period close on 4 February 2022. Note that information emerging after the close of Period 11 is subject to formal confirmation by CRL in its Period 11 reports. This report is supplemented by our weekly reports to JST and regular meetings with JST staff.

### Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
1.	28 February 2022	PSR 160 Period 11 FY 2021-22 Sponsor Summary v1.13 ~ Draft	<span style="background-color: black; color: black;">[REDACTED]</span>			
2.	4 March 2022	PSR 160 Period 11 FY 2021-22 Sponsor Summary v1.14 ~ Final	<span style="background-color: black; color: black;">[REDACTED]</span>			



The deterministic start of Stage 5B has slipped to [REDACTED] because it is taking longer than expected to address Auto-Reverse functionality issues. In order to mitigate this and allow passenger services between the NR surface sections and the Central Section to start in [REDACTED] 2022, RfLI proposes to introduce Stage 5B Minus; this is intended to provide a service frequency of up to 22 TPH, and avoid the need for the Auto-Reverse functionality. The critical link to the timescales for timetable bidding has resulted in the Stage 5C deterministic date moving from [REDACTED] December 2022 to [REDACTED] May 2023.

The Sponsors' particular attention is drawn to the following:

- CRL and RfLI have committed to complete safety assurance activities and secure an APIS on [REDACTED] March 2022, but delivery of supporting documentation will be challenging.
- Railway reliability remains below expectation and CRL/RfLI concern remains with the limited schedule opportunity for growth, [REDACTED]
- Bond Street Station delivery completion remains uncertain, with baseline schedule, costs and risks to passenger opening still to be finalised by CRL.
- The revised target date for Stage 3 opening marks the schedule opportunity boundary for RfLI and MTREL to complete their practical readiness preparations.
- Stage 5B Minus potentially allows the start of Central Section through services in [REDACTED] 2022, but Stage 5C is now driven to May 2023 to accommodate timetable bidding.

## 1.2 Health and Safety

In Period 11, CRL reported one Lost Time Incident at Bond Street Station and one High Potential Near Miss at Canary Wharf Station. Overall safety indicators remain within those set by the Programme. CRL and RfLI continue to implement measures to protect the Programme from Covid, with a focus on achieving Elizabeth Line passenger service.

## 2. Programme Overview

### 2.1 Schedule

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]

<sup>3</sup> Period 11 Executive Programme Performance Review meeting pack issued 23 February 2022.

The target date for completing all safety assurance activities and securing an APIS from the ORR is [REDACTED] March 2022. A Timetable Demonstration period will follow, during which signalling, rolling stock, TVS, and communications and control systems software upgrades will be implemented; these works are expected to facilitate an increase in overall reliability. The main risk to this date is the completion of the Technical Files and the issuing of the APIS by the ORR.

[REDACTED] and the main risk to entering passenger service is failure to achieve the required level of overall system reliability and resilience. The P80 date for the start of Stage 3 Passenger Service remains within the first half of 2022 opening window.

Delays in the completion of workstreams supporting the delivery of Auto-Reverse functionality, which is required for running a 24 TPH service, have resulted in slippage to Stage 5B to [REDACTED] 2022. To maintain the previous forecast start date of [REDACTED] 2022, CRL and RfLI are exploring the possible introduction of a modified stage, known as Stage 5B Minus, which will include a service frequency of up to 22 TPH, without Auto-Reverse functionality. This will be considered as part of DCS v1.3 schedule development and a commitment decision is expected to be made during Period 12.

The potential delay to Stage 5B has impacted the forecast date for Stage 5C; start of service is now driven out in the schedule to the next national timetable change in May 2023.

Achievements during Period 11 have included enactment of SC2 at Bond Street Station, the start of Trial Operations Phase 2, the approval of H5.6 rolling stock software and the upload of CMS software version 4.28.1.

## 2.2 Commercial and Risk

For Period 10, CRL reported a confirmed P50 AFCDC at £15,963m, which was a [REDACTED] increase on its earlier reported draft P50 AFCDC of [REDACTED]. This increase was attributed to the reversal of the [REDACTED] Scope Gap cost opportunity included in the draft forecast, and a revised offset of risk provisions associated with the early signs of Bond Street Station cost pressures.

At Period 11, CRL is reporting a draft P50 AFCDC of £[REDACTED], which is a reduction of [REDACTED]<sup>4</sup>. Overall, there was a [REDACTED] increase in the period, potentially offset by a [REDACTED] drawdown from CRL's risk provisions. Indirect Costs have increased significantly, with CRL reporting a [REDACTED] increase in CTG following the February 2022 workforce planning review, supporting a [REDACTED] BIU date for Bond Street Station; this is subject to ELDG endorsement. In the period, CRL has carried out a review of its Scope Gap allowances and has made positive efforts to transfer items to the COO reserve and to risk provisions, where appropriate.

CRL has recognised the significant challenge in pursuing delivery of the Programme against the £825m funding package and is presently considering a revised funding threshold. [REDACTED]

[REDACTED] The Period 11 draft P50 AFCDC is [REDACTED] above the current £825m funding threshold and [REDACTED] under the £1.1bn funding limit.

Schedule milestones continue to trend towards P50 dates with prolongation pressures extant, particularly with the Bond Street Station and Signalling contracts. We believe it likely that the majority of the residual Project, Programme and Prolongation Risk will be utilised to offset emerging issues. Consequently, it is likely that CRL will outturn close to its P50 forecast.

<sup>4</sup> In Period 11, CRL reports a £4m reduction with rounding.

## 2.3 Organisation

Demobilisation of the Paddington Station Tier 1 contractor was frustrated by restricted access and late supply issues, but was finally achieved at the end of January 2022; contract completion is now forecast for [REDACTED] 2022. Activity close-out continues at Canary Wharf Station, and CRL is targeting completion by [REDACTED] 2022, with the objective of demobilising the contractor at the end of [REDACTED] 2022.

## 2.4 Stage 3 Trial Operations and Passenger Service

The first Trial Operations Phase 2 mass evacuation exercise was carried out on 13 February 2022 and achieved a conditional 'pass'. The internal Trial Operations exercises are generally proceeding as planned, but they are taking place on a railway which is not in its final configuration, and is performing unreliably. This is not an ideal operating environment, and there is a risk that staff workloads are increased by the need to manage unplanned events, and that exercises are compounding perturbation.

Reliability continues to be variable and currently does not meet the criteria originally required for entry into Trial Operations Phase 2. An example is Public Performance Measurement (PPM), with the threshold for entry into Trial Operations Phase 2 of 90%, but the actual level is currently at approximately 85%<sup>5</sup>; 95% PPM is required for the start of passenger service. The causes of underperformance are train reliability, signalling faults, staff systems, organisational familiarity, and Platform Screen Doors; improvement workstreams are underway in each of these areas. Hardware and software upgrades will be deployed on rolling stock by the end of March 2022, signalling upgrade ELR200 will be implemented during the Easter 2022 Blockade and RfLI is carrying out a Process Improvement Programme. The objective of RfLI's work is to rectify processes that appear to hinder smooth operations or that extend perturbation disruption. RfLI is also carrying out a resilience review of assets other than rolling stock and signalling, to provide an additional layer of reliability during the first 100 days of passenger operation.

The difficulties and uncertainties in delivering the required reliability for passenger service is significant, [REDACTED]. Even with this additional time, achievement of the required reliability performance will remain challenging.

## 2.5 Stations Commissioning and Handover

Canary Wharf Station BIU was achieved on 21 January 2022. CRL continues to close out SJ Dependencies and EOWs to align with the deterministic target date for safety assurance acceptance by ITAP of [REDACTED] March 2022.

CRL achieved SC2 enactment at Bond Street Station on 17 January 2022. The BIU forecast date for both the Eastern and Western Ticket Halls at Bond Street Station is being held at [REDACTED], although is subject to confirmation at the next ELDG meeting.

Slippage is reported in the closure of EOWs at Whitechapel and Tottenham Court Road Stations, which CRL considers to be recoverable. CRL reports clearance of EOWs at other stations as being on schedule.

---

<sup>5</sup> Average derived from RfLI Daily Reliability reports - 18 days of operation from 8 January 2022 to 4 February 2022.

## 2.6 Assurance

Completion of the remaining assurance is dependent upon the delivery of evidence of completed EOWs and SJ Dependencies, Technical Files and SJs, and upon agreement between CRL and RfLI on system configurations and any necessary mitigations. CRL and RfLI will have to complete this work by early March 2022 to allow time for submissions to be made to ITAP and the ORR. This will be challenging, with both RfLI and CRL having already raised concerns over document quality and delays to the completion of reviews. This situation is similar to other key stages (e.g. Trial Running, Trial Operations Phases 1 and 2) except that there is limited opportunity to carry over any residual assurance workload into the passenger service period. Given that passenger service start-up is critically driven by reliability, any delay to the achievement of the full safety assured status on [REDACTED] March 2022 will not necessarily have an impact upon [REDACTED].

## 2.7 Future Stages

RfLI and CRL have previously targeted the start of Stage 5B services on the deterministic date of [REDACTED]. However, ongoing uncertainty with the availability of Auto-Reverse functionality has resulted in the planned start date changing to the P50 date of [REDACTED]. This change has affected Stage 5C opening, which has moved from December 2022 to May 2023.

RfLI still intends to connect the surface sections with the Central Section in [REDACTED] 2022 by operating a Stage 5B Minus service. This maintains the principles of services from the GWML terminating at Abbey Wood Station, and those from the GEML at Paddington Station. The peak service level will be 22 TPH (24 TPH for Stage 5B) and off-peak will be 16 TPH (20 TPH for Stage 5B). This approach is expected to provide additional driver resource and recovery time to compensate for the lack of Auto-Reverse. The decision to commit to Stage 5B Minus services in [REDACTED] 2022 needs to be made in [REDACTED] 2022, to enable driver rosters to be developed in time.

Work is still being undertaken to understand the criteria needed to support that commitment decision (and subsequent stage decisions), with the focus upon reliability and delivery of scope. Enhanced reliability is anticipated through software upgrades to signalling (ELR210) and rolling stock (H5.7 and H5.8), and through continuous improvement of people and processes (RfLI RCC and response staff, MTREL drivers and Train Maintainers). However, opportunities for testing and reliability demonstrations will become more restricted once the railway enters passenger service. Programme scope will remain for delivery after Stage 3 opening and CRL and RfLI are identifying the critical items pertaining to Stages 5B Minus, 5B and 5C.

Our concerns last period about a Stage 5C opening in December 2022 were based upon the uncertainty of Auto-Reverse functionality being in place, the schedule proximity to Stage 5B opening and muted support from NR. The postponement of opening to May 2023 relieves these concerns, albeit at the expense of delaying overall programme completion.

The revision of the Stage 5B and 5C opening dates is a pragmatic approach to managing the uncertainties of the later stages of the project. The introduction of a Stage 5B Minus also mitigates the delay in connecting the GE and GWML services with the Central Section. Nonetheless, we remain concerned at the poor rate of reliability growth, and the impact upon the implementation of Stages 5B Minus and 5B. Reliability must improve significantly over the next four periods to inform the commitment decision to Stage 5B Minus. This will be a challenge when management focus is likely to be on Stage 3 opening.