



**Crossrail Project Representative**

**Crossrail Joint Sponsor Team**

**Sponsor Summary**

**Project Status Report 151**

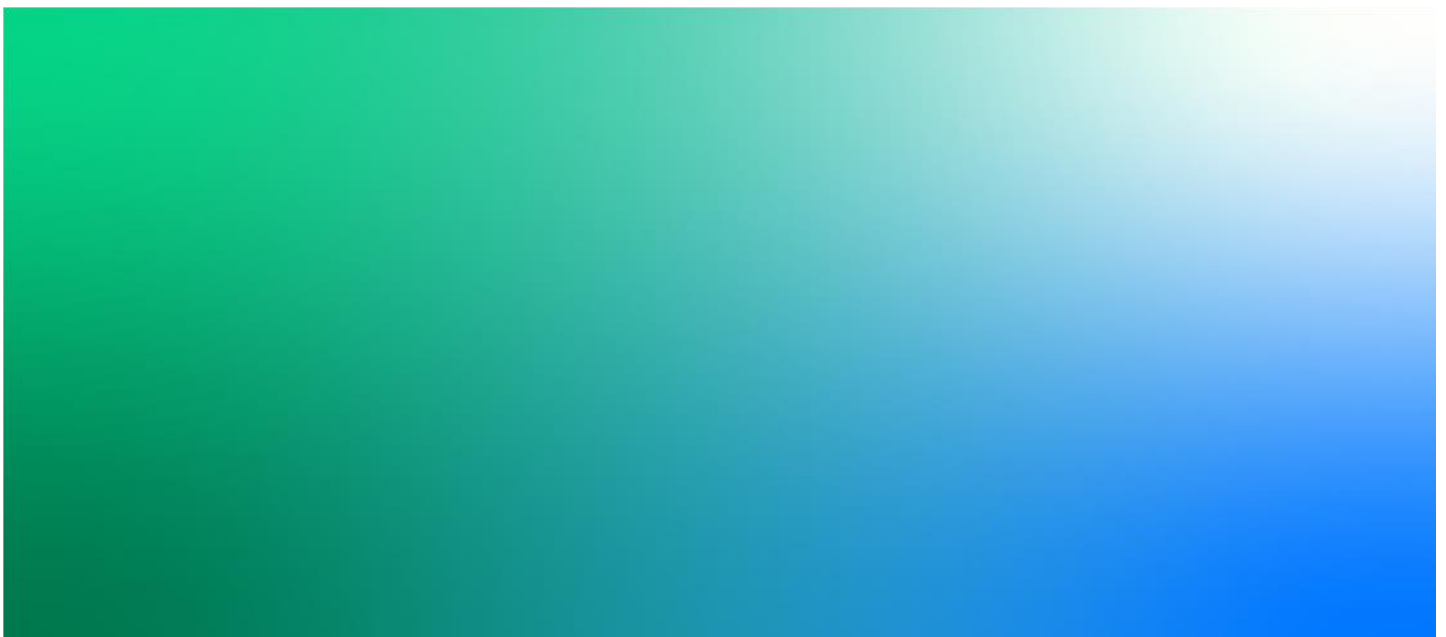
**Period 2 | FY2021/22**

**1 May 2021 – 29 May 2021**

**Official – Sensitive Commercial**

**Document No: B2387600/151/1.12**

**1 July 2021**



## Sponsor Summary PSR 151

Project No: B2387600  
 Document Title: Sponsor Summary for PSR 151  
 Document No.: B2387600/151/1.12  
 Date: 1 July 2021  
 Client Name: Crossrail Joint Sponsor Team  
 Client No: RM 3730  
 Project Manager: ██████████  
 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 2 reports augmented by more current information received by PRep during the course of our routine discussions with CRL since the Period close on 29 May 2021. Note that information emerging after the close of Period 2 is subject to formal confirmation by CRL in its Period 2 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.	21/6/2021	PSR 151 Period 2 FY 2021-22 Sponsor Summary v1.9 ~ Draft	██████	██████	██████	██████
2.	24/6/2021	PSR 151 Period 2 FY 2021-22 Sponsor Summary v1.11	██████	██████	██████	██████
3.	1/7/2021	PSR 151 Period 2 FY 2021-22 Sponsor Summary v1.12 ~ Final	██████	██████	██████	██████

## Sponsor Summary

### 1. Observations

Timetable trial running started with a 4 TPH service on 10 May 2021. While the priority since then has been staff familiarisation of systems and processes ahead of train performance, 96% of planned mileage has been successfully achieved.<sup>1</sup> The increase from 4 TPH to 8 TPH on 7 June 2021 has allowed railway operations to be intensified and mileage accumulation to be stepped-up. Where feasible, RfLI is intending to carry out operational and system exercises during the Trial Running period, that would normally be undertaken during Trial Operations. Secondment of an MTREL Director with NR infrastructure management experience into RfLI to lead its infrastructure readiness initiatives is also another positive move. Woolwich Station SC3 ROGS/BIU is planned for 25 June 2021, and Liverpool Street Station is scheduled to closely follow in early July 2021, leaving four stations to complete.

#### 1.1 Headline Concerns

Period 2 has been a period of uncertainty, with CRL and RfLI working on an Access Improvement Plan, the ELR100 delivery schedule, and their impacts upon DCS v1.2 development. Difficulties with safe controlled access to Routeway and Stations continue, and the development and implementation of processes which are fit for all of the Programme works to be completed (i.e. outstanding scope, maintenance, testing and reliability growth) remains the biggest priority. While the access issue remains unresolved, productivity continues to be significantly affected, and there is potential for further impact upon many future activities. A substantial change in approach is necessary to improve upon the approximately 60% of lost access opportunity that has occurred in the period. The full benefits of the proposed dedicated Access Control Unit (ACU) will only be realised when the team is fully established. With no date yet identified for the implementation of the Access Improvement Plan, it is likely that productivity will be severely reduced until [REDACTED].

RfLI's Maintenance Bridging works continue to be affected by the ongoing access difficulties. Output is restricted because of limited working hours, and there is concern that what little maintenance is being achieved is behind the forecast. An appropriate management dashboard would allow this important metric to be tracked. Maintenance delivery might be further impacted with [REDACTED] maintenance support to RfLI due to finish [REDACTED]. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Station productivity has been severely constrained by the significant loss in access opportunity. This has impacted the schedules for Bond Street, Canary Wharf and Paddington Stations. CRL is implementing an alternative strategy for Asset Data for acceptance by RfLI, to maintain delivery to deterministic dates. This is expected to result in additional costs. Bond Street and Canary Wharf Stations are likely to target completion for SC2 and SC3 ROGS, respectively, in mid-September 2021; however, there are risks that further delays will emerge. The Bond Street Station delivery schedule for SC3 ROGS achievement in [REDACTED] is not yet supported by the supply chain, and performance metrics are needed to allow management of completion.

<sup>1</sup> Crossrail Weekly Dashboard, Week 3 Period 1.

Despite improved clarity of scope for Stage 3 (and to some extent Stage 4/5), CRL and RfLI seem unable to reach swift decisions on criticality, timing of delivery, acceptability and operational impact, if completed beyond the IM's required date. [REDACTED]

Deployment of software ELR100 will be delayed by up to 8 weeks. Consequently, the second blockade for completing TVS and ELR100 works is now likely to take place in [REDACTED]. Given that 4 TPH trials started close to the DCS v1.1 P50 date, and that the greatest risks to the schedule are resolution of access, delivery of maintenance compliance, and resources, the previously reported deterministic date for Stage 3 Opening is no longer viable. CRL is expected to finalise DCS v1.2 by [REDACTED], and analysis to date suggests that it is still on track to start Elizabeth Line passenger services around [REDACTED], within the reported envelope of [REDACTED]. However, this remains to be validated by QSRA.

Opening of Stage 4/5 is important because of potential new revenue streams, but it does not yet appear to be receiving sufficient attention. Ownership of plan development is unclear and the opening strategy must be confirmed for operational impact assessment. The start of Stage 4/5 services is likely to be impacted by the delivery of a number of activities, the most prominent being signalling software ELR200 and reliability growth. [REDACTED]

[REDACTED] Confirmation of the signalling software development and delivery schedule is also urgently required. With the start of Stage 3 Passenger Service slipping against its deterministic date, the opening for [REDACTED] may move from [REDACTED] to [REDACTED].

Our concerns are summarised as follows:

- Development of a robust, underpinned and risk-assessed DCS v1.2 continues, without which key milestone dates and final costs remain uncertain;
- The Access Improvement Plan, which is critical for baselining future productivity assumptions, has not yet been implemented;
- There does not yet appear to be a strategic plan for maintenance delivery, and this is a significant threat to the start of Trial Operations;
- Progression of critical scope items from agreement to readiness for implementation, including agreement on delivery mechanisms, is unacceptably slow;
- Unforeseen signalling software deployment issues, insufficient reliability growth and poor mileage accumulation, remain significant risks to the start of Stage 3 Passenger Service;
- The Stage 3 Passenger Service opening window cannot be validated, nor impacts upon Stage 4/5 opening understood, until DCS v1.2 is available.

## 1.2 Health and Safety

Four High Potential Near Misses occurred in Period 2; two were related to possessions and electrical isolations. The Safety Performance Indicator decreased slightly, although the overall indicators remain within those set by the Programme. Control of safe access to the railway continues to be the highest safety priority for the management teams. Across the CRL sites, few new Covid-19 cases are being realised.

## 2. Programme Overview

### 2.1 Schedule

Scope workshops continued to clarify ownership, timelines for delivery, and the impact on Trial Operations, Stage 3 Passenger Service and Stages 4/5. Timely delivery will influence the number of Operational Restrictions necessary and is an important consideration for the IM. The outstanding critical scope will need to be included by CRL in DCS v1.2 with the commercial mechanisms for delivery confirmed and impact on schedule and cost determined. [REDACTED]

[REDACTED]

[REDACTED]

CRL continues to finalise the update to DCS v1.2. This process has become more challenging due to: uncertainty with ELR100 delivery, completion of the TVS which is impacted by access difficulties, an agreed approach to Asset Data for Bond Street and Canary Wharf Stations, the provision of contingency for STT, and assessment of reliability growth. A determining factor is confirmation in early June 2021 of the timing of delivery for ELR100. An [REDACTED] is expected to be confirmed which will require the second blockade to be moved [REDACTED]. The primary purpose of this blockade is to complete all TVS scope and ELR100 software installation and assurance.

Currently, [REDACTED] does not support the delivery date for Bond Street Station in [REDACTED], and the TVS suppliers schedule shows completion in [REDACTED]. These dates may need to be accelerated to mitigate delays to target dates for the start of Trial Operations. Supply chain support to DCS v1.2 under development is unlikely to be achieved before [REDACTED].

The adoption of realistic productivity assumptions will be important in finalising DCS v1.2. Given the low productivity achieved to date, there is no basis for assuming improved levels until the Access Improvement Plan is implemented. It is evident that the supply chain is assuming varying degrees of access improvement, with some believing that access will return to pre- ROGS transition levels; if incorrect, this assumption may affect future delivery dates.

### 2.2 Commercial and Risk

CRL's previously excluded cost pressures have been assessed in Period 2 for inclusion in its AFDCD. Our initial expectation of CRL's AFDCD for Period 2 was [REDACTED]. However, a revised proposed forecast of £15,939m was subsequently presented at EPPR<sup>4</sup> and was endorsed at ELDG<sup>5</sup>. We have not had the opportunity to review these updated figures in this Period 2 report, but will do so in our Period 3 report.

It is likely that cost pressures will continue to emerge as CRL finalises its DCS v1.2 scope, schedule and risk reviews. While this process continues, uncertainty remains and the AFDCD cannot be reliably underpinned or assured. We are observing a corresponding increase to the [REDACTED], as CRL continues with its DCS v1.2 re-baseline and progressively resolves cost pressures, together with the outcome of schedule slippage, scope increase, prolongation and access delays. We are concerned that CRL's prolongation risk provision will be fully committed due to ongoing access delays and low

<sup>2</sup> Project Delivery Review Meeting, 4 June 2021.

<sup>3</sup> Integrated Programme Review, 9 June 2021.

<sup>4</sup> Executive Programme Performance Review, 16 June 2021.

<sup>5</sup> Elizabeth Line Delivery Group Meeting, 24 June 2021.

productivity and that, while risk mitigations have been implemented, new risks and scope continue to emerge.

### 2.3 Organisation

CRL will progress with an update of its management systems over the course of the next few periods, ahead of an ISO9001 review in September 2021 and before the organisation demobilises at [REDACTED].

In Period 1, CRL's team was smaller than the January 2021 Workforce Plan forecast.<sup>6</sup> In Period 2, CRL's Indirect resource level was expected to be 1,125 FTE, driven by 68 roles being filled, and offset by 5 that were due to end. [REDACTED]

Resource concerns continue to be identified across the Programme, including: front-line delivery resources leaving critical areas of the supply chain (e.g. signalling); supplier-certified safety competent resources for the blockade works; and RfLI's limited assurance, maintenance, and access control functions (which the ACU is seeking to address, but for which 'additional' resources are required). We remain concerned at the impact that resources leaving the Programme will have on progress.

### 2.4 Stage 3 Trial Running, Trial Operations and Passenger Service

Since the achievement of ROGS in March 2021, the control and implementation of access to the railway under the RfLI Rule Book has proved extremely difficult and posed the greatest safety risk to the Programme. A contributing factor has been the size of the RfLI organisation which, while appropriate for a steady state railway, has been unable to cope with the volume of Programme completion works. A dedicated ACU has been established, and both CRL and RfLI are working collaboratively to address the access issue. The ACU needs to rapidly expand in size if it is to quickly make the necessary significant improvements. However, it is a concern that no date has been confirmed for when the Access Improvement Plan will be implemented. The cost for the additional ACU resources has not been anticipated, but it is seen by CRL management as an imperative expenditure, to mitigate further costs and value lost due to low productivity.

The establishment of control over the Maintenance Bridging Plan and all other preventative maintenance work is important for RfLI and CRL. Both organisations have experienced difficulties with access, isolations and possessions, which have impacted maintenance productivity. With maintenance works productivity levels less than forecast, ensuring asset maintenance compliance is essential for the achievement of Trial Operations. The challenge will become greater as railway operations intensify after the start of Trial Operations, requiring an increase in levels of maintenance. There is a risk that Operational Restrictions are imposed or, at worse, trains stop running, if assets are not compliant; both scenarios will impact mileage growth.

System Testing with the Train (STT) started in the period, although success has been mixed, with test failures, logistical challenges and opportunities lost to higher-priority works. The STT completion

<sup>6</sup> Crossrail Executive Management Group, 1 June 2021, Workforce Plan Update, Period 1 data.

rate of approximately 50% is below expectation. While there are recent positive signs of an improvement, the Staging Plan for Trial Running is likely to be updated to allow contingency for re-tests to provide float. Slippage from CRL's DCS v1.1 baseline deterministic date for the start of Trial Operations of [REDACTED] will provide this schedule contingency opportunity for STT, but this will need to be balanced against other demands, such as for maintenance works and 12 TPH running.

The ramp-up to 8 TPH trials started on 7 June 2021, with 12 TPH forecast for mid-July 2021. However, against DCS v1.1, overall mileage growth is down by approximately 70%. Completion of the Central Section competence programme for MTREL drivers is currently behind plan<sup>7</sup>; while recovery was forecast in time for the start of 8 TPH trials, this did not materialise.

Improvements to isolation and possession management are being addressed through the Engineering Hours Improvement Programme (EHIP). This Programme is being managed as an independent workstream and implementation is likely to have a significant cost impact. While a detailed plan to completion is to be finalised, forecast completion in [REDACTED] will lead to an improvement in maintenance periods; until then, it is likely some Operational Restrictions will be required.

With ELR100 deployment delayed by up to 8 weeks, we believe that CRL's target date for the start of Trial Operations on [REDACTED] will now not be achieved; it is likely that CRL will work to a deterministic date [REDACTED] in finalising DCS v1.2.

The deterministic date for Stage 3 Opening is unachievable due to a combination of factors identified in this report. CRL's P50 date of April 2022 is subject to validation through a QSRA on DCS v1.2 when it is fully developed and finalised. However, CRL is likely to drive towards a Stage 3 Opening date as early as possible in [REDACTED].

## 2.5 Stations Commissioning and Handover

Stations progress has been severely constrained by difficulties with access in the period. This is starting to improve from a position of approximately 10% success rate against plan in 8 weeks. However, reliable access remains a risk to stations delivery and completion, particularly at Canary Wharf, Paddington and Bond Street Stations. Late receipt of Asset Data by RfLI poses the greatest risk to stations completion. While CRL has been hampered by access, a test case is under development for Woolwich Station to maintain the Asset Data delivery date of 25 June 2021 for SC3 ROGS/BIU. While this may meet some of the IMs expectations, it is likely that maintenance support will be required after handover, with additional associated costs. Liverpool Street Station is on target for SC3 ROGS/BIU achievement on 3 July 2021.

Planning commenced for the first 10-day blockade starting on 21 June 2021. CRL is planning to deliver and complete all the outstanding trace-dependent EOWs for the Routeway and Stations. Bond Street Station will be the exception, with approximately 30 EOWs remaining. Agreement on the processes for working under the ROGS Rule Book in the blockade will be required between CRL and RfLI. A key assumption is that access will be improved during the blockade, in order to maximise delivery efficiency. However, it is unlikely that the same productivity levels will be realised in June 2021 as seen previously. This is principally because the re-planning of lost works under the ROGS Rule Book is more difficult than under the Construction Railway Rule Book. A significant factor will also be the availability of safety-qualified competent resources.

<sup>7</sup> CRL Weekly Dashboard, Period 3 Week 1.



Considerable work remains to achieve full handover to the IMs (both LU and RfLI) after the achievement of SC3 ROGS/BIU. Generally, all stations require additional periods of up to 3 months for the completion of full handover, and a further 3 months for contract completion. [REDACTED]

The Bond Street Station [REDACTED] date for SC2 requires mitigation to recover a [REDACTED] and is anticipated to slip into mid-September 2021. Achievement of the SC3 ROGS date in [REDACTED] is also likely to be a challenge, as currently the supply chain cannot support delivery to this date. CRL's pursuit of [REDACTED] for SC3 ROGS is likely to result in partial functionality with extended support after achievement. Canary Wharf Station requires completion of all remaining physical works, as well as assurance and a substantial number of Trial Operations EOWs. In order to hold the planned date of [REDACTED] for SC3 ROGS/BIU, recovery of 8 weeks delay is required<sup>8</sup>. It is likely that both Canary Wharf and Bond Street Stations will target mid-September 2021 for completion, delayed from their DCS v1.1 deterministic dates.

## 2.6 Assurance

A delay to the second blockade to [REDACTED] will provide more time for the delivery of assurance evidence for stations. However, there remains a substantial stations assurance workload due to the overall number of EOWs that remain outstanding.

The delivery of integrated signalling and rolling stock safety assurance for ELR100 will be a challenge, even if the second blockade moves. ELR11X software is scheduled for release in late [REDACTED], and will incorporate fixes for any faults arising from ELR100, and a track database update to take account of planned NR works on the GWML in its [REDACTED] Blockade. Time must be allowed for train testing and route proving following the deployment of ELR11X, before Passenger Service can commence.

## 2.7 Future Stages

Clarity is required on the implementation of Stage 4/5, planning for which does not appear to be receiving sufficient attention. This might be down to the limited availability of the Programme team which has a priority focus on Stage 3. Demonstration of reliability growth and delivery certainty of signalling software such as ELR200 will help to provide confidence in advance of the planned implementation of Stage 4/5. [REDACTED]

[REDACTED] It is likely that, with potential slippage against the deterministic date for Stage 3 Opening, the opening for [REDACTED] will slip from [REDACTED] to [REDACTED].

<sup>8</sup> Integrated Programme Review, Part A, 8 June 2021.