



Crossrail Project Representative

Crossrail Joint Sponsor Team

Sponsor Summary

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Note: This report relies on the information set out in CRL's Period 9 reports augmented by more current information received by PRep during the course of our routine discussions with CRL since the Period close on 8 December 2019. Note that information emerging after the close of Period98 is subject to formal confirmation by CRL in its Period 9 reports. This report is supplemented by our weekly reports to JST and regular meetings with JST staff.

Document history and status

Revision	Date	Description	By	Review	Approved
1	14 January 2020	PSR 132 Period 09 FY 2019-20 Sponsor Summary v1.2 ~ Final	[REDACTED]		

Sponsor Summary

Health & Safety Performance

As reported last period, the disparity between the Tier 1 contractors' assessments of their own H&S performance and CRL's assessment provided a worrying insight into the true safety performance of the Crossrail Programme. We had anticipated this period that an equalisation of the scores between Tier 1s and CRL would occur; however, the HSPI has actually increased to 2.63. This is due to a step up in performance from the Tier1s, following CRL highlighting their true performance in the previous period.

During the period there were 7 HPNMs. This is a substantial increase in the average number of HPNMs/period, which has been 2.75 over the last 8 periods. Each incident is being rigorously investigated by CRL and the principle contractor; however, the reasoning behind the sudden increase is not yet known. While train testing and running is increasing, the incidents are still centred around construction activities.

H&S KPI	Target	Aim	Period 7	Period 8	Period 9
HSPI	2.20	-	2.62	2.59	2.63
RIDDOR AFR	0.15	0.06	0.09	0.09	0.09
HPNM	-	-	0.34	0.32	0.34
LTI	0.23	0.17	0.16	0.17	0.17

Figure 1 - 1 ~ Health and Safety Performance COS

Programme Delivery

Predictable Performance

In the last period, CRL has instructed all projects to revise their philosophy of planning to aggressive and, in some cases, unachievable targets, and to base their schedules on more realistic dates. The consequent effects of this new approach are still to be fully expressed in the Period 9 schedule dates, as they their effects are being assessed by CRL. We do not anticipate this exercise will be complete until Period 10 or 11.

While we fully support this new approach, we have not seen the underpinning evidence that would support such date movements. A change control process detailing key schedule movements would aid this transparency.

CRL is planning to publicly announce a revised opening window at the TfL Board Meeting on 20 January 2020. [REDACTED]

[REDACTED]. CRL will therefore need to overlay a 'management judgement' to accommodate this uncertainty. This approach was previously adopted in May 2019, when the DCS was baselined, and in August 2019, when it was clear that ROGS was not achievable in [REDACTED]. On both occasions, the management overlay was insufficient to accommodate key risks that continue to occur, such as poor Tier 1 productivity.

Noting the commitment given by the CRL Board to declare a Stage 3 Opening date, following the CRL Board Meeting to be held on 9 January 2019, we believe there is now insufficient time to fully underpin the schedule. As a consequence, a 'management judgement' approach, rather than a fully underpinned schedule, is the only realistic option remaining. However, we would like to highlight that this approach increases the risk to the predictability of the future opening

dates and funding envelope. We also reiterate our comment in our previous report, that we do not believe the schedule can be 'assured' until June 2020, at the earliest.

High Level Schedule Summary

The Period 9 DCS schedule continues to demonstrate low productivity and slippage in Cardinal Milestones¹. See Appendix B. The start of Trial Running has slipped in the period from [REDACTED] to [REDACTED] due to a slower than anticipated rate of production in the Routeway assurance and delays in the approval of the Engineering Assurance Justifications (ESJs). However, based on our assessment of the current production rates for the assurance and handover deliverables, this date could slip further, by up to 4 periods, if CRL does not intervene to change the current trajectories. CRL has developed several interventions, which if implemented, will improve the current position. The effectiveness of the interventions proposed, are difficult to assess, until further details are known.

A total of 37 out of 120 Cardinal Milestones have now been completed to date, against an approved plan of 53. 9 milestones were achieved in the period against an original target of 9 (Note: the 9 achieved were not the original 9 CRL planned). Of the 83 remaining milestones, 78 are now forecast beyond the [REDACTED] with 5 forecast to be within the approved date. See Figure 1 - 1. The number of Cardinal Milestones with more than 50 days negative float has increased in the period to 44.

CRL 3 Lines of Defence

1st Line of Defence

As reported previously, it is important that CRL teams all work to common standards, to ensure consistency and robustness of the product. A number of procedures are still overdue, and it is concerning that these include: programme assurance management plan; Red Lines and As-Built Drawings procedure; Systemwide Execution Plan; and the Crossrail Engineering Safety Management manual. One key procedure missing from the update is the schedule management process, which we have highlighted several times. It is critical this process is created to allow us to understand how the schedule is underpinned and whether it is consistent in its production.

In addition to the above procedures, following a review of CRL paperwork which highlighted anomalies, RfL has insisted on reviewing all ACs before considering Handover. This will particularly impact upon all those assets approaching Handover, such as Custom House Station, as well as the Portals and Shafts.

This has the potential for a fundamental impact on the delivery dates, as CRL had assumed it had completed the underpinning assurance in the past and because it forms the basis of the work to complete. If this assurance is found to be flawed, this assumption is undermined. CRL would then not know where it stood with respect to the work-to-go, and this would result in a significant amount of rechecking, with impact upon the end date. It is anticipated the review of ACs by RfL will be complete by the end of January.

2nd Line of Defence

Targeted Assurance Reviews

No TARs have been submitted for review this period.

¹ Appendix B – DCS Cardinal Milestones – Period 9.

Period Assurance Reviews

CRL's internal assurance team has highlighted a number of issues that affect the effectiveness of the DCS:

- DCS completeness – The DCS is not providing sufficient priority identification to allow teams to focus their efforts;
- Stakeholder alignment – While there is good coordination between stakeholders, this is not systematic across the programme;
- Scope discovery – The schedule does not include all of the scope.

The above points align with our assessment of the schedule and are essential to underpin a robust schedule going forward.

3rd Line of Defence

Although we had expected two audits to be issued for comment, to date, we have not received any audits to review.

Cost, Commercial & Risk

The financial statements for the Period 9 Board Report do not deviate or change from the previous Period. At Period 9, CRL is reporting that the P50 AFCDC held at £15,313m, pending a review of cost and risk. This is £350m above Sponsors Funding of £14,963m. CRL is reporting that there are emerging cost pressures at the Stations, particularly [REDACTED] and [REDACTED]. This is an indication that there is an expectation that the AFCDC will increase in Period 10.

During the period, CRL reached [REDACTED]. This resulted in 'one-off' payments that have driven a £31m overspend against the DCS budget. Prolongation at [REDACTED] also contributed to the overspend. It is currently unclear to us whether or not these costs are included in the DCS and, if so, where they are allocated; it is possible that this is a report timing issue rather than actual additional cost. We intend to clarify with CRL during Period 10.

The COWD in the Period increased by £94m with a corresponding decrease in CTG. Risk has not changed in Period 10 and remains at £388m.

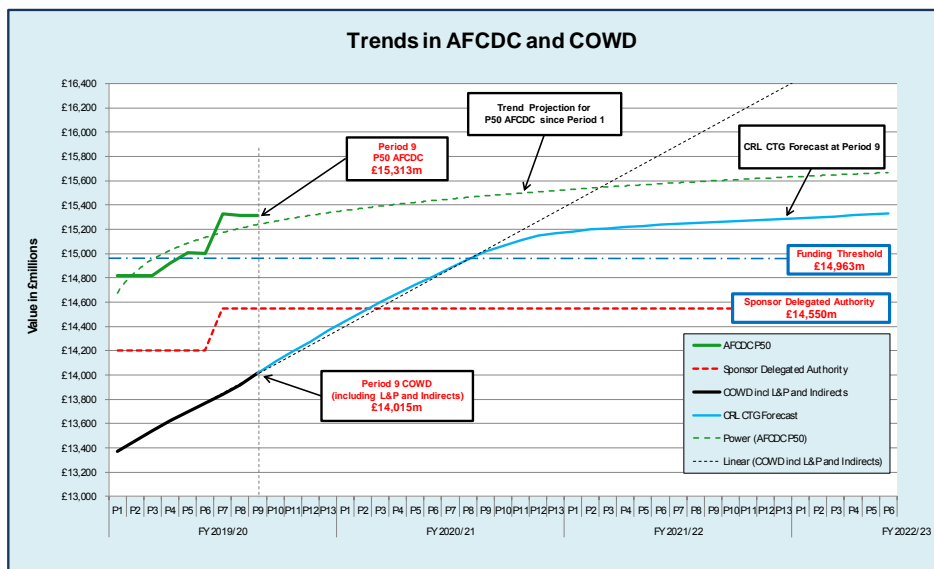


Figure 1 - 2 ~ AFDCDC Headroom to Sponsor Delegated Authority

Stage 2B

Driver training on the Heathrow Spur has begun, and the approval process for passenger service has started. The process is expected to be concluded during the first quarter of 2020. The start of passenger service, and the delivery of the full 4 TPH service, will be dependent upon the reliability of the train and the rate that drivers complete training.

Stage 3

There have been further delays to the forecast SC3 completion dates for Stations and Handover dates for Portals and Shafts this period. The delays over recent periods have been attributed by CRL to: implementation of the T-Minus process; the need to fully complete assurance documentation; poor quality of Tier 1 documentation submissions; the replacement of Kentec fire panels; and continued low levels of productivity. In addition to continued lower than anticipated levels of production, the delays experienced by SSPs in Period 9 have been attributed to the more detailed definition of CRL’s requirements for SC1, SC3 and SC3 ROGS that have now been formally instructed to each contractor. CRL’s original agreed and instructed definition saw SC3 achieved on the conclusion of both the physical installation works and supporting documentation, at the completion of Phase 2 T&C (IRNs/PCCs/PACs). While the requirements for iACs/ACs were clarified 3 periods ago, the effects are only now impacting on the schedule.

CRL is also in the process of reviewing the SSP schedules to move away from targets to realistically achievable rates and durations of delivery. This particular exercise still assumes the date for the start of Trial Running is [REDACTED] but the planned date has since slipped to [REDACTED]. CRL must now produce a detailed and fully integrated schedule up to the start of TR, completion of SC3 and Handover to the IMs. Work on CRL’s schedule review is ongoing. We believe that further schedule delays will be reported in Period 10, as the review draws to a conclusion.

Approvals, Assurance and Agreements

RAB(C) and subsidiary Sub-Groups have continued to meet in the period, but meeting postponements have continued because of a lack of formal submissions. While the production of key submissions continues to suffer from deep-seated delays in infrastructure delivery, and a

lack of contractor resources, some progress is finally evident in the setting of dates for RAB(C) presentations for handover readiness.

T&C evidence is not being produced at the planned rate to close the Derived Safety Requirements (DSRs), compounded by Tier 1 contractors not consistently delivering the submissions to the quality required by the CRL assurance team and IM. This means re-writes are required, absorbing time and resource. The CRL assurance team is running workshops to address the quality of submissions, and contractors and CRL Delivery should use these opportunities to reduce re-work. A similar situation applies to ESJs, where slow physical delivery impacts upon the completion of the documentation. Current concerns are design issues affecting TVS, power, and signalling at the fringes.

Rail Systems & Dynamic Testing

CRL has embarked on a new schedule planning initiative² in order to take advantage of the slippage to the start of Trial Running to [REDACTED] (Note that this date has moved in Period 9 to [REDACTED] [REDACTED] This builds upon work undertaken several months ago, which was focussed upon the previous planned Trial Running start of [REDACTED] The output is known unofficially as 'Mega Plan 2', and it is intended to be used to underpin future updates of the DCS. The end product will be a detailed schedule which contains all activities necessary to achieve Trial Running (in line with the pre-requisites as currently defined), and a hardening of the scope to be carried out during the Trial Running period. The planning initiative acknowledges that further schedule slippage is possible, and CRL is also considering in the background the opportunities that further time provides. Any meaningful benefits rely upon improvements in the timescales for software assurance, and the efficient delivery of multi-train testing productive, in order to maximise reliability growth.

As with previous periods, the delivery of planned tests has been subject to disruption due to events, issues and asset failures. The situation has not improved in the last period, with a range of avoidable 'people and process' issues during testing of P_D+10 in MDT 37 conspiring to deliver some of the worst test completion performance to date, with only 54% of planned tests completed. We are concerned that poor Dynamic Testing delivery performance has deteriorated to become one of the most significant risks to the achievement of Trial Running, and there is an urgent need for a root cause review to establish and eliminate sources of failure.

Reliability Growth

Reliability growth is controlled by the Reliability Steering Group, which is making some progress at understanding the immediate issues prior to, and immediately after, the start of Trial Running. However, the challenge is a formidable one.

CRL's reliability team has identified a route to reaching 90 MTBSAF, the currently accepted target for starting Trial Running. This is expected to be achieved post introduction of the P_D+12 software configuration. The 90 value is not a mandated figure, but much less than that and the Railway could have a sub-optimal start to Trial Running.

Stage 5A Summary

Stage 5A successfully introduced the planned service, using RLUs on 15 December 2019. This was a result of good collaboration between RfL, CRL, NR and MTREL.

² An initial scoping workshop was held on 18 December 2019.

³ CRL Period 9 report – schedule progress summary.

The next challenge will be to swap the RLUs with FLUs. RfL is likely to want to do this as soon as possible so it can begin to drive up reliability. MTREL will be concentrating upon operating a reliable service, so is likely to seek from BT via RfL a certain performance threshold from the trains to enter service.

Stage 5B Opening

There is little change of significance from our last report. The Handover milestones for WP2 (Acton, Ealing Broadway, West Ealing) are being maintained, but those for WP3, particularly Hayes & Harlington and Southall are under pressure and realistically will move to [REDACTED]. This has an impact upon cost and delayed public benefit, but the assets would still be available in time for Stage 5B Opening.⁴

Agreement between CRL, MTREL, RfL and NR about NR's Value Engineering proposals ([REDACTED] [REDACTED]) has not yet been reached.

Stage 4 & Stage 5 Summary

The Stage 4 works are set to be completed in good time for the likely revised Stage 4 Opening. CRL's Period 9 forecasts give most likely dates for Stage 3 Opening of [REDACTED], Stage 4 Opening in [REDACTED] and Stage 5B Opening in [REDACTED]. Therefore, to meet the Stage 4 Opening date, CRL will need to produce sufficient assurance to NR between [REDACTED] [REDACTED] (essentially the period of Trial Operations) that it could operate a robust service. If evidence is not sufficient, Stage 4 Opening could move to [REDACTED], in [REDACTED]. This assumes that the required assurance can be provided by [REDACTED].

Key for CRL will be reaching a clear understanding of what range of performance and rate of growth will be required by NR, in order to give it the assurance it needs to support service implementation.

Key Areas of Concern in the Period

As reported previously, tangible progress has since been made by CRL in several areas, but further work is still required by CRL in: i) limiting the increasing AFCDC through risk mitigation; ii) the alignment of the safety and technical assurance documentation production rates within the DCS.

Based on this period's status report, we consider the following point requires further action or explanation to Sponsors by the CRL Leadership Team:

1. The exercise to incorporate: i) Change from planning to targets, to realistic forecasts; ii) Categorisation of the outstanding EOWs for Trial Running; and iii) Inclusion of 'known-unknowns', such as NCRs still to be raised, will all have an impact on the planned date of [REDACTED] for ROGS. What assurances can CRL provide to Sponsors on the robustness or confidence in this date?

⁴ CRL's current Period 7 forecast is Stage 5B opening [REDACTED]

⁵ A successful implementation of Stage 4A could give some flexibility to changes outside the National timetable change, but a yet to be defined reliability threshold would still have to be met.