

## Terms of Reference

### 1.0 Objective

Should CRL determine that a change to the staged opening dates is required Sponsors will need assurance that CRL's arguments are well founded on a realistic assessments of performance to date, performance assumptions and a comprehensive assessment of risks, such that a high degree of confidence can be placed in any revised schedule. The objective of the Schedule Assurance Review (SAR) is to provide Sponsors with that assurance.

### 2.0 Scope

It is proposed that the SAR is in two stages. The first will focus on providing assurance, to the Sponsor Board on 3 September, that CRL's forecast dates for the start of dynamic testing are realistic. The second will provide assurance that any revised schedule can be relied upon. Both stages should consider all aspects of the project including the works delivered by Crossrail Ltd, Network Rail, Bombardier and MTR Crossrail.

Stage 1 is to focus on current construction, installation and static testing activity to determine realistic dates for the start of dynamic testing, trial running and trial operations, relative to the current control schedule (MOHS). Stage 1 should consider:

- CRL's current assessment of completeness and the durations assumed for the completion of construction/installation, static testing, dynamic testing, trial running and trial operations, in the light of experience to date and any resource constraints. With a focus on the installation and testing of key elements of the route way and critical systems (C610 and C660 in particular).
- The reasons for any material difference between contractors schedules and CRL's.
- The risk that schedule pressures have built up in the current programme and have yet to impact (for instance, de-scoping or deferral of activity building up a "bow wave" of future activity).
- The degree to which any work is likely to extend into trial running/operations and can be efficiently completed, once access is controlled by the operators.
- Timescales for contractor demobilisation.
- Evidence that assumptions made about third party performance are supported by those parties.
- That the critical paths are understood and whether time risk allowances are adequate.
- Recent experience of opening new railways elsewhere.
- Emerging risks.

It should be noted that in the time available a line by line forensic analysis of the detailed master control programme will not be possible and that the reviewer will be required to form a view based on targeted analysis, interviews and expert judgement.

The output from Stage 1 will be a presentation to Part A of the Sponsor Board on 3 September and will confirm if CRL's assessment of a delay to the start of dynamic testing, trial running and trail operations is a reasonable basis for subsequent decisions. It is particularly important that sponsors are provided with a transparent view of the date for the start of dynamic testing.

Stage 2 of the SAR will then focus on the integrity of any revised schedule proposed by CRL for Stage 3 opening, as well as plans for the commencement of Stage 4 and 5 services. In particular, Stage 2 will examine the revised schedules for static and dynamic testing, assurance/approvals, trial running, trial operations and bringing into service, and look for evidence that those plans are supported by the third parties concerned. It will consider:

- The integration of construction, testing and commissioning, dynamic testing, approvals, trial running and trial operations schedules.
- The degree to which those schedules are supported by the third parties involved in their delivery including suppliers, industry partners, network operators (inc. access and timetabling), concession operators, Infrastructure Managers and Regulators.
- The degree to which those schedules could accommodate further slippage of the high risk activity, such as software development.
- The degree to which those schedules could be accelerated.

In addition, it is anticipated that CRL will update its current Cost Scenario Analysis (commonly referred to as “The Bookends”) to align its latest view of completion dates. Once received, Sponsors may ask for it to be reviewed in parallel with the Stage 2 work, procuring additional expert resource as necessary.

The output from Stage 2 will be a presentation to Part A of the Sponsor Board on 20 September, that will set out an assessment of the risk to revised opening dates and the potential for acceleration. Sponsors may direct further review and analysis following that presentation.

### 3.0 Resources

It is proposed that Stage 1 is completed by Ian Rannachan, known to Sponsors as a highly experienced planner, a former employee of Bechtel, who previously led the construction planning team on the Crossrail. It is proposed that Stage 2 is completed by John Boss, an experienced consultant who has previously been involved in the retrospective assessment of opening Stage 1 operational readiness for the project.

Sponsors may procure additional resource as necessary. Noting, Tom Wilne from Jacobs is available to complete a review of any update to CRL’s Cost Scenario Analysis.

### 4.0 Governance

The SAR is to be directed by and report to the Crossrail Sponsor Board. Day to day activity will be managed by the Joint Sponsor Team working with CRL.

The Sponsors will establish a steering group to provide challenge and advice to the reviewers. It is proposed that group will be led by Andy Pitt and Mark Wild, who will appoint other members as necessary.

Whilst the work is being commissioned by CRL, both Ian Rannachan and John Boss will work independently. The findings of the review will be shared with the CRL Board following their presentation to Sponsors.