

Date: 24 November 2022

Item: Elizabeth Line Programme Assurance Update

This paper will be considered in public

1 Summary

- 1.1 This paper reports on progress with programme assurance activity across the Elizabeth line since the last report.
- 1.2 A paper is included on the Part 2 agenda which contains supplementary information that is exempt from publication by virtue of paragraph 3 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the business affairs of TfL. Any discussion of that exempt information must take place after the press and public have been excluded from this meeting.

2 Recommendation

- 2.1 **The Committee is asked to note the paper and the exempt supplementary information on Part 2 of the agenda.**

3 Background

- 3.1 The Elizabeth line Integrated Assurance Framework is based on a Three Lines of Defence model comprising:
 - (a) Line 1 – Management functions of Crossrail Limited (CRL), Rail for London (Infrastructure) Limited (RfL(I)) and key interfaces;
 - (b) Line 2 – Project and Programme Assurance Elizabeth line (PPA-EL); and
 - (c) Line 3 – TfL Internal Audit and a sub-group of the Independent Investment Programme Advisory Group (IIPAG-EL).
- 3.2 This paper reports specifically on Line 2 (PPA-EL), Line 3 (Internal Audit) and Line 3 (IIPAG-EL) assurance progress.
- 3.3 The teams meet periodically with a panel of advisers to ensure that assurance is carried out by the right team, at the right time and to avoid duplication and minimise overlap of effort.

4 Line of Defence 2 (LoD2) Assurance

- 4.1 Since the Elizabeth line entered Revenue Service on 24 May 2022, the service has continued to perform consistently at a good level in the Central Operating Section (COS). This consistency supported the T-minus process decisions to implement enhanced train services (Stage 5b minus) on 6 November 2022, with

trains running directly from Reading and Heathrow to Abbey Wood, and from Shenfield to Paddington.

- 4.2 The train fleet and overall system continue to perform well in the COS. Additional train and signalling software upgrades and other interventions (including for Platform Screen Doors) are providing further operational reliability improvements.
- 4.3 The reliability of the Network Rail (NR) infrastructure on the Great Western Main Line (GWML) has been of concern ahead of the introduction of Stage 5b minus service, however NR have set out a series of interventions aimed at delivering improvements for Stage 5b minus and beyond through to Stage 5c in May 2023. These improvements are monitored and reported on a weekly basis and good progress is being made.
- 4.4 Work has continued on a continuous assurance basis with formal reporting via the LoD2 Periodic Assurance Review (PAR) Reports. Of particular focus has been the overall system and fleet reliability and availability, the quality of the service response to issues arising during service operation as well as the status of continued works and people and team readiness across all aspects of the Operation and Maintenance teams, in preparation for Stage 5b minus.
- 4.5 Since the last meeting of the Committee, LoD2 PAR Reports have provided input to the periodic Integrated Assurance Report to the Elizabeth Line Delivery Group.
- 4.6 Regarding cost to complete, although potential new cost pressures are being prudently recognised in the Anticipated Final Crossrail Direct Cost (AFDC) as they arise, the programme continues to maintain provision and contingency budgets. Actions are ongoing across all areas to identify opportunities to reduce the AFDC and minimise funding requirements.
- 4.7 The programme for the remaining works to successfully deliver the whole end to end railway has been baselined and is being used to monitor progress.
- 4.8 Deterministic dates are being held and are as follows:
 - (a) Stage 5b minus is 6 November 2022 (22 trains per hour (tph) peak/16 tph off peak, Shenfield to Paddington, Abbey Wood to Reading and Heathrow); and
 - (b) Stage 5c is May 2023 (24 tph full end-to-end service), dictated by the national railway timetable changes. The key drivers continue to be confidence in achieving the required fleet availability and whole systems reliability to support the enhanced intensity of service. The maintenance of the programme is being led by the Elizabeth line Operations team, with support from CRL for those elements of work it is responsible for.

- 4.9 The project has continued to make significant progress since the last report, key progress highlights include:
- (a) the successful opening of Bond Street station to passengers on 24 October 2022;
 - (b) commencement of the physical works at Westbourne Park (civils, fencing and signage) to facilitate later introduction of auto reverse functionality;
 - (c) achievement of the target for fleet availability required for Stage 5b minus as well as the continued strong reliability performance in the COS since the commencement of live operational service;
 - (d) improvements in team working and embedding of lessons learnt across the Operations teams, leading to strong service recovery and incident handling;
 - (e) continued engagement, planning and the implementation of improvement initiatives with NR on the GWML to prepare for the integration of railways for Stage 5b minus; and
 - (f) software upgrades to signalling, fleet and infrastructure (Platform Screen Doors) software enhancing performance further.
- 4.10 The maintenance programme has been reviewed and significant improvements implemented to support the enhanced utilisation of resources and the introduction of automation, thereby delivering a more efficient maintenance service. Experience during operational service in the COS is helping to shape the improvements required in terms of response and fix times and root cause analysis to support a 22/24 tph service.
- 4.11 Both fleet and system performance reliability and availability are on a positive trajectory towards meeting the desired performance targets expected for Stage 5b minus, however these are being closely monitored on a weekly basis.
- 4.12 Following our risk based continuous assurance approach, concerns and recommendations are identified throughout each reporting period. Management responses for those items are provided in the following table and have been provided during Periods 5 and 6 of 2022/23 (24 July to 17 September 2022) (P5 and P6).

Periods 5 and 6	LoD2 Concerns	Management Response
P5/1	<p>Staff Readiness for 24 tph – Visibility of plans to train and familiarise staff (drivers, Operations staff in the Romford Control Centre and stations staff and command and control teams). This should include the shift in mindset to working in a 22/24 tph environment.</p>	<p>Competent team numbers continued to steadily grow in line with the plan. All efforts focused on maximising numbers of competent resources across all roles prior to 6 November 2022.</p>
P5/2	<p>Timetable (TT) Demonstration for 5b minus – Important that the TT has had sufficient opportunity to be tested as a through service for Stage 5b minus. Specific exercises to test the interface contingency plans and the end-to-end railway, with staff given the opportunity to experience the impact and response required from perturbations during a 22 tph service. In addition, attention should be given to lessons learned from previous two TT trials, e.g. the poor performance of the Customer Information System (CIS) during the demos and the short timescale we have to resolve before Stage 5b minus. Consideration to be given to testing bringing Bond Street online, with particular focus on testing the impact of stopping at Bond Street station on the overall TT performance.</p>	<p>The challenge of operating Timetable Editor (TTE) in disruption has now been established with significant impact on workloads for the Timetable Manager if not covered by any other resource. Plan mobilised to introduce a new role and interim arrangements in place for 6 November 2022 ahead of the permanent recruitment plan. The TTE role and arrangements will also greatly assist in keeping CIS up to date by ensuring cancelled trains (if applicable) are removed from the relevant systems and CIS.</p>
P5/3	<p>Maintenance – Good progress has been made in the prioritisation and scope development of the Access Improvement Programme. However, as we move into implementation, we require visibility of plans for supporting resources within Maintenance teams, both project specific and other</p>	<p>The Access Improvement Programme has been progressed with the benchmark exceeding for entry into Stage 5b minus. A confidence statement has been drafted which has been endorsed. Access improvement still continues to be a business priority with activities still in flight however it has been acknowledged that the threshold has been met for entry into Stage 5b minus.</p> <p>Critical resources in the resilience workstream</p>

Periods 5 and 6	LoD2 Concerns	Management Response
	critical resources to ensure the expected performance improvements are delivered in time for Stage 5b minus and the maintenance response is as required in a 22 tph railway.	have been planned and identified to ensure that the maintenance capability continues into Stage 5b minus. The Maintenance team is analysing its staff to ensure that there are the right number of competent people within the business. This is being included as part of the Maintenance Improvement Plan.
P5/4	Great Western (GW) Performance – Whilst progress continues and further improvement initiatives are underway, we recommend continued prioritisation and visibility at weekly cadence meetings of infrastructure and train performance improvements and resource plans for Thames Valley Signalling Centre.	<p>The ownership cuts across a number of stakeholders. The prioritisation and visibility of the items listed is being made more explicit at weekly forums such as the T-minus as an example and other forums are looking more end-to-end in anticipation of the railway becoming more joined up.</p> <p>The focus continues to shift to GW performance as well as the performance of the railway as an inter-connected 'whole'.</p>
P5/5	Signalling Software – Better alignment between CRL and RfL(I) on scope for Engineer's Line Reference (ELR) version upgrades to avoid confusion and time wasting.	Overall ELR scope is managed by the Chair of the 'Plateau' (technical systems integration meeting), who takes on-board requests from Asset Engineers, Operators (RfL(I) and MTREL)), Performance team, Maintenance team, as well as rolling stock and weaves it into a single list, to ensure Siemens have no doubt about the RfL(I) desires and hence avoid disappointment, timewasting, etc. CRL (who manage the C620 contract) then use the Staged Completion Report process to control delivery of the scope.
P5/6	Fleet performance – While performance in the COS is encouraging, surface performance remains concerning. The short-term mitigation is dependent on Alstom meeting trains at turnarounds and no permanent solution is proposed for implementation before autumn 2023. A plan is to be shared on how a permanent solution can be addressed more quickly.	<p>Relates to prevalence of European Train Control System (ETCS) defects requiring the driver to perform resets in service.</p> <ol style="list-style-type: none"> i. Technicians have been in place at key turnaround locations since 18 September 2022 to carry out ETCS health check and complete any reset prior to departure time. ii. Alstom undertook a component swap on specific trains with statistically highest susceptibility-material on depot on 30 September 2022. Assessed service-performance benefit in October. iii. Alstom have launched a new configuration development (H5.30) with a target date of May 2023 to deliver an earlier permanent solution. This will be implemented on the

Periods 5 and 6	LoD2 Concerns	Management Response
		<p>Fleet from May 2023 (advanced from autumn 2023) if step (ii) above does not yield the expected reduction in ETCS resets.</p> <p>The above plan has been presented by Alstom – and copied by TfL to LoD2.</p>
P6/1	<p>Command and Control – Recommend a desktop exercise to test the roles and responses across the different organisations, especially in light of recent changes with the addition of a Senior Service Delivery Manager Role being introduced into the Regional Control Centre for Stage 5b minus. Need to test the new role in relation to other roles in the command-and-control structure.</p>	<p>We have carried out three workshops to cover this which have captured a small number of actions across all parties to complete. While not critical to 6 November 2022, they will be closed out as quickly as possible.</p>
P6/2	<p>Great Western – We recommend the development of backup (contingency) plans in the event that GW are unable to present trains ‘Right Time’ (RT) to the COS.</p>	<p>As part of the Western Route Readiness for Stage 5b minus- the following have been actioned:</p> <ul style="list-style-type: none"> • Agree Regulatory Policy to prioritise ‘RT at COS’; • Formal commitment to ‘RT at COS’ for Elizabeth line trains (not within the Public Performance Measure); Commitment provided to ‘RT at COS’; • Revise train regulation protocol to deliver ‘RT at COS’ with all operators; RT Regulation policy already written, shared and briefed to Control and signallers – NR will be actively monitored to ensure adherence to policy taking into consideration MTR feedback on outcomes; • Minimise unplanned Main/Relief line crossing (Anglia and West Coast Main Line experience); Service Principles which aim to ‘contain’ disruption to mains/reliefs minimising impact.
P6/3	<p>Desktop Exercises for critical processes Stage 5b minus – Would recommend at least another couple of desktop exercises to enable staff to be given the</p>	<p>Two sessions including control and signallers (desktop/simulation) planned for every Wednesday started on 28 September 2022</p> <p>In terms of coverage for the TTE, we now have this covered with currently four people and a fifth</p>

Periods 5 and 6	LoD2 Concerns	Management Response
	opportunity to experience how to respond to the impact of perturbations during a 22 tph service, including cut and run and contingency timetable.	arriving for training on 6 November 2022. Training is approximately two weeks. The four initial people can cover the role sufficiently.
P6/4	Auto-Reverse – Some good progress has been made with the definition, procurement and delivery of fence and Closed-Circuit Television (CCTV) works for Westbourne Park. Further clarity needed on the scope of Auto-reverse being delivered for December and what impact this may have on the operation.	Driverless Train Reverse Operation Forward, the first move of auto-reverse forward, required to enable Auto-Reverse at Westbourne Park is the scope planned for December 2022. Unplanned Auto-Reverse and Driverless Train Reverse Operation Backward, the first move of auto-reverse backwards, required for tunnel sections is targeted for early 2023 with support of Operational Restrictions.
P6/5	System Reliability Performance Management – We recommend continued emphasis on a systems wide integration approach in managing the performance of the railway system when planning future functionality enhancements/software updates across signalling, comms and control and fleet software. We also recommend a single systems expert to arbitrate on multi party fault finding, close out and assessing solution trade-offs.	We continue our systems wide integration approach with our systems experts at a working level. Systems wide integration is discussed as part of our governance in the Elizabeth Line Reliability Board, Reliability and Resilience Delivery Group as well as Plateau Technical Integration meetings.

5 Line of Defence 3 (LOD3 -TfL Internal Audit) Assurance

5.1 This section covers the Internal Audit activities that were agreed in the Integrated Audit and Assurance schedule.

5.2 In P5 and P6 we issued four reports and one audit was in progress.

Audit Delivery

5.3 Summary information of the reports issued in P5 and P6 is set out below.

5.4 Two audits of the Crossrail Complaints Commissioners Accounts were undertaken for 2021/22 and four months of 2022/23 to provide assurance that figures in the accounts are accurate. On the basis of the work carried out, it was confirmed that the accounts of the Crossrail Complaints Commissioner, in all

material aspects, accurately reflect the receipts and payments during the financial periods ended 31 March 2022 and 31 July 2022.

- 5.5 The cost verification audit of Equans (formerly Engie) provided assurance on the adequacy and effectiveness of cost verification controls over payments. We found certain controls were adequately designed and operating effectively. For example, costs were verified for the Canary Wharf contract site through checking a large sample of invoices and staff payments. However, other controls such as competitive quotations, cost benchmarking, or the checking of goods receipt notes were not consistently applied.
- 5.6 The Crossrail Act Obligations Audit was rated as 'Adequately Controlled'. One medium priority issue and one low priority issue were raised. The medium priority issue relates to the need to review resources dedicated to validating and confirming third party agreements and obligation discharge ahead of programme close out. In addition, formal assessment of any long-term monitoring beyond this has yet to take place or be agreed. Audits in progress at the end of P6 are included as Appendix 1, and work planned to start in Quarter 3 and Quarter 4 of 2022/23 (18 September 2022 to 31 March 2023) are included as Appendix 2.

Management Actions

- 5.7 The team monitors the implementation of all Internal Audit management actions and confirms whether they have been adequately addressed before closing them. There are no overdue actions at the end of P6.

Changes to the Audit Plan

- 5.8 TfL Internal Audit regularly review and update the audit elements of the Integrated Audit and Assurance Audit Plan throughout the year, in liaison with management, to reflect changing business priorities. No changes to the plan have been made to date.

6 Line of Defence 3 (LoD3 - IIPAG-EL) Assurance

- 6.1 The terms of reference of the IIPAG-EL sub-group require the group to provide a 'look ahead' of its proposed areas of interest and work. The areas of interest highlighted as part of the revised Integrated Audit and Assurance Schedule in February 2022 continue to apply. We also support the 'continuous assurance' process established by LoD2. This schedule is maintained and reviewed within the Elizabeth Line Programme Assurance Group which is co-ordinated by LoD2.
- 6.2 The focus by LoD3 over the reporting period has been on the preparations for the enhanced service level of Stage 5b minus, and the Stage 5c full 24 tph service. A more comprehensive update is provided in the paper on Part 2 of the agenda.
- 6.3 In general, the overall assurance framework for Elizabeth line has continued to operate effectively.

List of Appendices:

Appendix 1: Line 3 (TfL Internal Audit) Work in progress at the end of Period 6 2022/23
Appendix 2: Line 3 (TfL Internal Audit) Work due to start in Quarter 3 and Quarter 4
2022/23

List of Background Papers:

None

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