

Date: 25 May 2022

Item: Elizabeth Line Readiness

This paper will be considered in public

1 Summary

- 1.1 On 4 May 2022 Transport for London (TfL) announced that, subject to final safety approvals Elizabeth line will open on Tuesday 24 May 2022, transforming travel across London and the South East. After the opening of the central section, direct services from Reading, Heathrow and Shenfield are expected to connect with the central section in Autumn 2022 with a full service across the entire route by May 2023.
- 1.3 Once open, the Elizabeth line will operate 12 trains per hour between Paddington and Abbey Wood from Monday to Saturday 06:30 to 23:00. Work will continue in engineering hours and on Sundays to allow a series of testing and software updates in preparation for more intensive services from the autumn.

2 Recommendation

- 2.1 **The Committee is asked to note the paper.**

3 Performance of Operational Service

- 3.1 TfL Rail delivered a Public Performance Measure of 92.3 per cent during period 13 (6 – 31 March 2022). Performance on the east was 92.0 per cent whilst the west recorded 92.7 per cent during the period, with infrastructure failures impacting on both routes. The overall Moving Annual Average trend ended the year at 94.2 per cent.
- 3.2 In the east, passenger services between Shenfield and Liverpool Street are being operated by nine-car class 345 trains. In the west, services to Heathrow are operated by nine-car class 345 train, while services between Reading and Paddington are operated by a combination of nine-car and seven-car class 345 trains. The seven-car trains are progressively being converted at Old Oak Common Depot to nine-cars, with this programme due to be complete in May for all but a few seven-car trains which will remain in use until the start of through-running services into the Elizabeth line central section.
- 3.3 There has been a progressive increase in class 345 reliability but not to the level previously anticipated. A new suite of reliability focused software is

currently being installed on the fleet by the manufacturer Alstom which has been forecast to deliver an additional improvement.

4 Operational Readiness

- 4.1 The programme of Trial Operations in the central section concluded in March with five mass volunteer exercises, at Custom House, Farringdon, Limmo Peninsula, Canary Wharf and Paddington, all being safely conducted and passed either with comments or in their entirety. The exercises involved strong collaboration with several organisations, including Network Rail, British Transport Police, London Fire Brigade and the London Ambulance Service. In between these, smaller scale exercises also took place as well as reliability and system testing.
- 4.2 The timetable demonstration phase commenced on 28 March and continues over the final few weeks of pre-Revenue Service, running 12 trains per hour through the central section. This phase allows for a sustained period of reliability testing and although there remains work to do on improvements to train and signalling systems, communications and SCADA (Supervisory Control and Data Acquisition) and high voltage switching equipment, reliability in general continues to show an improving trend.
- 4.3 During the Easter weekend, the latest signalling software update ELR200 was installed bringing significant benefits, although some bugs were identified and subsequently addressed.
- 4.5 Customers on the west of the central section, between Paddington and Reading, have been benefitting from new station buildings and step-free access following the completion of Network Rail station enhancement works.
- 4.6 Network Rail continues its station upgrades on the east of the central section, between Liverpool Street and Shenfield, focusing on completion of the station enhancement works at Romford and Ilford. Although Romford station has been affected by delays with gaining acceptance and assurance to enable handover, all parties are working collaboratively to deliver the ticket hall and lifts into use during May 2022, ahead of final completion and formal handover of the new buildings. Good progress on the slab replacement within the main concourse has been made at Ilford station. Demolition of the defective slab elements is now complete, and the new composite deck is due for completion by the end of May. It is anticipated that the station building and lifts will be brought into use in the summer 2022.
- 4.7 In response to an action from the last Committee meeting to provide an overview of our asset monitoring, we have a range of remote condition monitoring and real time asset data systems in place, with more still to come, particularly from the system on the class 345 trains. In particular, the infrastructure monitoring vehicle runs every two weeks and measures track geometry, condition, ultrasonics, and switch geometry as well as pattern

recognition that highlights anything considered out of the ordinary (such as missing components measured against a base line video).

- 4.8 Platform screen doors, high voltage and low voltage supplies, signalling components such as axle counters and points machines and rail temperatures are all covered and recorded either live, with alarms triggering urgent attention, or providing trending data on things such as platform screen door opening times. An example of that trending data is provided below.
- 4.9 The graph below shows the standard deviation in milliseconds against a threshold of 300ms. Any door reacting in a time longer than this is considered a risk and will require some form of intervention. This level was recently reduced from 400ms as performance improved in order to allow earlier intervention.

Slow Closing PSDs (Standard Deviation) Latest Day



5 Stage 5b

- 5.1 The plan to complete the end-to-end railway entails three steps; 5b-minus which will provide a 22 trains per hour peak (16 trains per hour off-peak) frequency in the central section (Paddington – Whitechapel) which can commence outside of a National Rail timetable change but requires a 16-week notice period; and stages 5b and 5c both of which step up the peak frequency to 24 trains per hour but require auto-reverse and will be implemented to align with the National Rail timetable change.
- 5.2 Reliability will be a key factor in commencing and moving through the Stage 5 stages with the reliability on each of the west, central and east sections needing focus and management. Particular attention is also currently on the transitions which will be key to support Stage 5. A T-minus process is being established that builds on the approach taken to countdown to commence revenue service of the Elizabeth line.

6 TfL Residual Works Programme

- 6.1 The residual works team continue to progress several pre and post revenue service activities across the London Underground and Rail for London (Infrastructure) Limited estate. All pre-revenue service items are on track to be delivered before 24 May 2022. Weekly meetings attended by senior representation from all areas are occurring to finalise post revenue scope in addition to removing any blocks to pre revenue delivery.

List of Appendices:

None

List of Background Papers:

None

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