

This paper will be considered in public

1 Summary

- 1.1 This paper summarises recent progress towards staged opening of the Elizabeth line as well as transition of the Crossrail project to become an integral part of TfL. Proposals for increased frequency of service are covered in a separate agenda item.
- 1.2 On 8 March 2017, the Programmes and Investment Committee considered this paper. Members noted the progress on the testing of the new rolling stock and signalling software and both Mike Brown's and Mark Wild's involvement in ensuring a smooth transition, including Mark's role as a member of the Board of Crossrail Limited. The Committee congratulated the team on the momentum of the project and the significant improvement in the reliability of the existing railway service between Liverpool Street and Shenfield since TfL had taken over responsibility, which had been achieved without any new capital investment.
- 1.3 There were no specific issues raised for the attention of the Board. Further information in respect of project progress was included in the Crossrail Sponsor Board Update submitted to the Committee.

2 Recommendation

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

3 Background

- 3.1 Construction is being undertaken by Crossrail Limited (CRL), a wholly owned subsidiary of TfL, sponsored jointly by TfL and the Department for Transport.
- 3.2 Overall, construction is now 82 per cent complete. Track laying is 76 per cent complete. The major physical activities currently underway are fitting out of stations, installation of the mechanical and electrical systems including ventilation, lifts and escalators, as well as installation of cabling, communications, power and signalling systems.
- 3.3 At this stage in the project there is a significant focus on finalising design and fulfilling the various assurance processes necessary to allow the handover of the infrastructure and bringing it into use as an operational railway.

4 Current Operations

- 4.1 Train services between Liverpool Street and Shenfield are currently branded as 'TfL Rail' in advance of the opening of the central tunnel and their renaming as the Elizabeth line in December 2018.
- 4.2 TfL Rail continues to be amongst the most reliable of any of the national train operators. In Period 11 96 per cent of trains met the Public Performance Measure (PPM), the second best performance of any operator in the country. 87.9 per cent of trains arrived within one minute of schedule, the highest figure for any UK operator.

5 Progress towards Phased Opening

- 5.1 Crossrail (the Elizabeth line) will open in five stages to allow the various parts to demonstrate reliable operation before all the train, tunnel and surface elements are brought together in 2019.
- 5.2 **Stage 1** is the introduction of the first of the new Class 345 trains to run on existing tracks between Liverpool Street and Shenfield from May 2017.
- 5.3 Class 345 testing between Liverpool Street and Shenfield commenced 13 January. In addition to the test train, based at Ilford, five further units have been completed and are undergoing testing at Bombardier's factory at Derby or at the Network Rail (NR) test track at Melton.
- 5.4 A critical part of the construction and introduction are the multiple on-board systems and the complex software (the Train Control and Management System) that integrates them. Successive software releases are tested at Derby before installation on the test trains and then on the units running on the network. The final stage prior to passenger service is Independent Safety Assessment (ISA) and Office of Rail and Road (ORR) approval.
- 5.5 The 'test' trains carry additional equipment and will be returned to the factory for refitting before they are ready for passengers. The first unit that is fully fitted out for passenger service (345005) is scheduled to be delivered to Ilford at the end of February 2017, in time for on-network running and driver training in advance of entry into full service at the end of May.
- 5.6 Two train simulators, currently based at Ilford are in use for driver training and allow a degree of familiarity with the cab and route to be gained in advance of train delivery.
- 5.7 A critical component of the programme for introduction of the Class 345 is work by NR to adjust platform edges and provide other equipment at stations on the route. Significant progress was made over the Christmas 2016 Blockade with the remaining work taking place overnight and whilst the railway is closed at weekends. All works are scheduled to be complete by March 2017.
- 5.8 Work at Ilford Depot to accommodate the new trains is also nearing completion. The test trains will be accommodated in existing sidings but the new sidings,

provided specifically for Crossrail units are expected to be available for use in May 2017.

- 5.9 **Stage 2** in May 2018 will provide four trains per hour between Paddington and Heathrow replacing the current two trains per hour Heathrow Connect service, operating to Terminals 2/3 and Terminal 4.
- 5.10 For Stage 2 the Class 345 train will be upgraded by Bombardier to operate with European Train Control System (ETCS) signalling, as the tracks between Heathrow and Stockley (where trains join the current Great Western Main Line) are amongst the first in the UK to be fitted with this system. NR is making good progress fitting the equipment to the 'wayside' (track). This is provided by Alstom. Following laboratory testing this will be integrated and tested with the train in the second half of 2017.
- 5.11 Stage 2 also requires work to the tracks and stations. There are significant platform works to be undertaken, including adjustment of heights, to allow successful introduction of the new trains to the route. NR is shortly to finalise its integrated plan for the necessary works.
- 5.12 The main depot for the train fleet is at Old Oak Common, where the maintenance building is structurally complete and track laying and fit out of systems and equipment is underway. The first section of the depot is planned to be ready in the Autumn to receive the trains that will operate to and from Heathrow from May 2018.
- 5.13 Finally, with respect to Stage 2, suitable track access agreements need to be in place to operate on the Heathrow branch.
- 5.14 Further details of operational readiness and plans for service introduction for Stages 3, 4 and 5 will be included in future updates but in summary:
 - (a) In December 2018 (**Stage 3**) services commence in the Crossrail central tunnel, operating between Paddington (new underground platforms) and Abbey Wood, via the West End, City and Canary Wharf. From this date services will be referred to as the Elizabeth line. The first tranche of apprentices who will work on operations and maintenance of the central section the line started training in 2016. Specialised track maintenance trains are currently being assembled for delivery in the first half of 2018.
 - (b) In May 2019 (**Stage 4**) Shenfield to Liverpool Street services are connected into the central tunnel section to run as far as Paddington.
 - (c) Finally, in December 2019 services from the west are connected into the central tunnel and Crossrail trains are extended in the west to Maidenhead and Reading. This is the final phase (**Stage 5**) of Crossrail service introduction.

6 Crossrail Transition and Integration Programme

- 6.1 The Transition and Integration Programme has been established, managed by a Steering Group of senior TfL and CRL managers reporting to the Integration Board, which comprises the Chief Finance Officer, the Managing Director London Underground, the Director of Human Resources and the Chief Executive of CRL.

6.2 The aims of this programme are to:

- (a) ensure the project is supported, protected, closed and integrated successfully; and
- (b) transfer talent, knowledge and processes for the benefit of TfL and Crossrail 2.

6.3 The focus of the most recent activity has been:

- (a) completing the transfer of the Tunnelling and Underground Construction Academy at Ilford which will continue to offer construction training whilst also being used for the training of Elizabeth line maintenance and operational staff;
- (b) ensuring role charters and accountabilities for the individual workstreams are clear and identifying any items not covered by existing plans and budgets;
- (c) supporting secondments to Crossrail 2 to try and ensure that lessons from the current project are carried through into future works;
- (d) clarifying responsibilities for land and property agreements, which necessarily involve both the project and the long term asset owner; and
- (e) reviewing the remit of the Customer Service element of Transition to ensure that it is sufficiently comprehensive.

6.4 Separate from the Transition Programme, work is underway to produce an integrated communications strategy covering the period during which the Crossrail project becomes the Elizabeth line. This will aim to ensure that both customers and stakeholders are clear on what is being delivered at each part of the – potentially complex – staged opening.

7 Conclusion

7.1 Crossrail/Elizabeth line continues on course to open as planned, in stages between May 2017 and December 2019.

7.2 TfL and CRL continue with a structured programme to support and protect CRL project delivery and identify and mitigate the risks of transition into TfL.

List of appendices to this report:

Appendix 1: A Class 345 train at Liverpool Street station 13 February 2017

List of Background Papers:

None

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Appendix 1

A Class 345 train at Liverpool Street station 13 February 2017

