

Date: 6 December 2023

Item: **Elizabeth Line: Service Frequency Increase for High Speed 2**

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## **This paper will be considered in public**

### **1 Summary**

- 1.1 The Elizabeth line is a key dependency for High Speed 2 (HS2) to realise Old Oak Common (OOC) as a super-hub and the best-connected station in the UK by providing new journey options. It is crucial to supporting HS2 passengers interchanging from the Midlands and the north of England, as well as Great Western Railway (GWR) passengers arriving into London.
- 1.2 The investment in higher frequency is needed to relieve wait times at the station, reduce on-train crowding and provide shorter journey times for more customers using OOC station. Introducing connections and higher frequency in 2030 will maximise benefits, in particular during the period of HS2 terminus operation, and a compelling case remains for maintaining the higher frequency once HS2 services continue through to Euston.
- 1.3 The purpose of this paper is to seek unbudgeted Financial Authority subject to the provision of funding being agreed by HM Government, Programme and Project Authority to set up the programme within our management structures and Procurement Authority to order additional trains under the existing contract with Alstom for class 345 trains for the Elizabeth line.
- 1.4 Supplementary information is included in Part 2 of the agenda for Members. This information is exempt and is therefore not for publication to the public or press by virtue of paragraph 3 of Schedule 12A of the Local Government Act 1972 in that it contains information relating to the business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 and other parties.

### **2 Recommendations**

- 2.1 **The Committee is asked to note the paper and the exempt supplementary paper on Part 2 of the agenda and, subject to HM Government agreeing to provide the capital funding for the acquisition of additional rolling stock for the Elizabeth line and related services and enabling works:**
  - (a) **approve unbudgeted Financial Authority, for the amount set out in the paper on Part 2 of the agenda;**
  - (b) **approve Programme and Project Authority, for the amount set out in the paper on Part 2 of the agenda for the activity described in this paper;**

- (c) **approve Procurement Authority, for the amount set out in the paper on Part 2 of the agenda to order additional trains under the existing contract; and**
- (d) **note that matters for which Authorities are sought above include commitments beyond the period of the 2023/24 Business Plan and provision will, therefore, need to be made for those commitments in future Business Plans (including that to be considered by the Board in December 2023).**

### **3 Background**

#### **HS2 programme aspirations for OOC**

- 3.1 OOC will become one of the country's most vital transport super-hubs and is set to be the best-connected and largest new railway station ever built in the UK. The station will have 14 platforms, a mix of six high-speed and eight conventional service platforms and is expected to be one of the busiest railway stations in the country (up to 250,000 passengers per day).
- 3.2 Connections are expected between high-speed rail services to the Midlands, north of England and Scotland, with access to central London and Heathrow via the Elizabeth line and travel to Wales and the south west on GWR services.
- 3.3 The construction and operation of the station will drive the regeneration of the area around it in west London to provide up to 26,000 homes and 56,000 new jobs.

#### **Elizabeth line is required to achieve outcomes**

- 3.4 An effective connection to the Elizabeth line is critical to:
  - (a) encouraging use of HS2 services over other existing services into London and release capacity on the West Coast Mainline;
  - (b) providing onwards journeys at OOC that are required during the expected period of about 10 years when OOC will be the terminus of HS2 services and to reduce demand at Euston once the HS2 station is opened;
  - (c) providing an interchange route with the main line services into and out of London; and
  - (d) providing system resilience and operational flexibility to manage during network disruptions.
- 3.5 The Elizabeth line will also be an important link into central London for the local area to support Old Oak and Park Royal to deliver new homes and jobs to the opportunity area.
- 3.6 It is crucial that planning for HS2 considers the outcomes for the existing railway and travel network to ensure journeys remain reliable for all customers.

## **4 Need for investment and benefits**

- 4.1 TfL modelled the impacts of using OOC as a terminus for HS2 services with a frequency of HS2 services of three trains per hour (tph) and six tph. This shows that with a 12 tph service on the Elizabeth line during the AM peak, levels of crowding on Elizabeth line trains will be comparable with Tube journeys in central London (greater than four passengers per square metre). This would be significantly at odds with our customers' expectations arriving from the new HS2 services.
- 4.2 The implications of this situation for customers would be significant and would continue to increase the longer Euston is delayed:
- (a) passengers trying to board the Elizabeth line at OOC across the peak period could face a wait time of over 10 minutes as multiple Elizabeth line trains may reach capacity before clearing the platform;
  - (b) crowd control measures at the station and additional platform staff may be required to maintain safe operations by holding customers at different parts of the station to avoid congestion on stairs, escalators and platforms; and
  - (c) overall, there will be a significantly degraded customer experience at OOC from station opening which will worsen over time, undermining the benefits of HS2. This is likely to lead to negative reputational impacts and a need to resolve the problem long after efficient and effective potential solutions have expired.
- 4.3 In addition, we would expect significant negative operational impacts to the reliability of the entire Elizabeth line that would also undermine the benefits of the joint London and Department for Transport (DfT) investment in Crossrail.
- 4.4 While there are currently limited opportunities to increase capacity to the west of OOC due to constraints on network capacity and availability of paths, the HS2 project unlocks the ability to turn Elizabeth line trains at OOC. This allows an increase in the peak service frequency from the current 12 tph to between 18 and 24 tph. This would be enabled by the purchase of five additional class 345 trains to supplement the existing fleet of 70 trains.
- 4.5 This solution would deliver multiple benefits for the travelling public and support wider regeneration and growth objectives. Increasing the frequency from 12 tph to between 18 and 24 tph would lead to:
- (a) a direct reduction in waiting times for HS2 and other passengers transferring onto the Elizabeth line, together with a significant reduction in on-train crowding levels described above, including much higher seating availability through the use of OOC as a starting station for a proportion of services;
  - (b) an end-to-end travel experience more commensurate with the expectations of the new HS2 service which would increase customer satisfaction, ridership and revenues for HS2; and
  - (c) realising the Government's ambitions for OOC to become a well-used super-hub and the best-connected station in the UK while supporting the delivery

of the regeneration and growth of the Old Oak and Park Royal Opportunity Area.

## 5 Options considered and preferred approach

5.1 The table below outlines the options considered to mitigate the impacts to the Elizabeth line of introducing OOC and realise the Government's desired outcomes for the HS2 project. Options considered include 'Do Nothing', 'Do Minimum' and 'Do Something' scenarios. The key considerations for each option are included.

|   | Option description   | Key considerations   |
|---|--|--|
| Do nothing                                    | Elizabeth line does not call at OOC                                    | <ul style="list-style-type: none"> <li>No network connection benefits</li> <li>Precludes ability to operate OOC as terminus</li> </ul>   |
| Do minimum                                    | Existing Elizabeth line services call at OOC                           | <ul style="list-style-type: none"> <li>Unacceptable customer and performance impacts to existing Elizabeth line services</li> <li>Undermines benefits of HS2</li> </ul>  |
|   | Elizabeth line calls at OOC and GWR does not call at OOC               | <ul style="list-style-type: none"> <li>No network connection benefits and interchange for GWR</li> </ul>   |
| Do Something: Investment in additional trains | Increase Elizabeth line services to 16 tph to OOC                      | <ul style="list-style-type: none"> <li>Some additional capacity but may not align with HS2 services</li> <li>Does not provide flexibility to increase services in future</li> </ul>  |
|   | Increase Elizabeth line services to 18 tph or above to OOC (Preferred) | <ul style="list-style-type: none"> <li>Relieves crowding on trains and wait times at station</li> <li>Higher frequency maximises use of station and benefits</li> <li>Regular service interval minimises performance risk</li> </ul> |
|   | Increase Elizabeth line services beyond OOC                            | <ul style="list-style-type: none"> <li>Capacity constraints on western route beyond OOC</li> <li>TfL assessing other investment options given wider pressures on network</li> </ul>  |

5.2 We presented the case for additional trains at the OOC Industry Forum on 17 April 2023 hosted by Network Rail and attended by DfT and other industry stakeholders. Collectively it was agreed we should progress the funding discussions with the DfT for the investment in additional rolling stock to uplift the Elizabeth line services to 18 tph or above in preparation for the opening of OOC station in 2030. This reflects:

- (a) the need for a reliable route into central London during the period of OOC being the HS2 terminus;
- (b) the unacceptable customer and performance impacts to the existing Elizabeth line services without a service upgrade; and
- (c) the desire to provide the full connectivity benefits from the opening of the station in 2030.

5.3 It was also recognised at the Industry Forum that timetable and performance analysis is required to confirm the service frequency that can reliably be operated between 18 tph and 24 tph given the constraints on network capacity, availability of paths and performance on the western route. We are currently working with Network Rail to define the scope and timeframe of analysis.

## **6 Programme components**

6.1 To enable higher Elizabeth line frequency, five class 345 trains added to the existing fleet of 70 will provide the flexibility to increase frequency to 18 tph and above, up to 24 tph (four in service and one maintenance spare).

6.2 A modification to Westbourne Park turnaround facility is required to enable stabling of the additional trains and additional operating costs are expected to account for train maintenance, station connection and additional distance travelled.

6.3 The programme will coordinate with our HS2 programme team who are managing our interfaces with the HS2 construction programme at OOC and our service planning teams who are leading with Network Rail the development of timetables to introduce and operate a reliable service to OOC.

## **7 Economic appraisal**

7.1 The economic analysis shows that there is a high value for money case to connect GWR and Elizabeth line services at OOC and invest in additional trains to increase frequency of Elizabeth line services to 18 tph and above with a benefit to costs ratio of at least 3.45 to 1. The additional services will relieve wait times at the station, reduce on-train crowding and provide shorter journey times for more customers using OOC station.

7.2 The analysis shows that benefits are maximised by introducing the connections and higher frequency in 2030 as the highest annual social benefits are during the period of time when OOC station is the HS2 terminus.

## **8 Funding**

8.1 Following the OOC Industry Forum on 17 April 2023, the DfT requested that TfL includes the case to fund the additional Elizabeth line trains required to support delivery of HS2 as part of our 2024/25 capital request. This reflects the collective agreement at the Industry Forum that we should progress the funding discussions with the DfT for the investment in additional rolling stock to uplift the Elizabeth line services to 18 tph or above in preparation for the opening of OOC station in 2030.

- 8.2 We have requested funding for the additional trains and enabling works as part of our current request to Government for capital funding in 2024/25; this request for Financial Authority, Programme and Project Authority and Procurement Authority is made subject to HM Government committing to meeting that funding request.

## **9 Commercial arrangements**

- 9.1 The existing fleet of 70 class 345 trains was manufactured by Bombardier (now Alstom) between 2015 and 2019. The class 345 fleet was purchased from TfL by, and is leased back to TfL by, 345 Rail Leasing Limited. TfL sub-leases the trains to the Elizabeth line concession operator, MTREL.
- 9.2 The class 345 fleet is maintained and prepared for daily passenger service by Alstom under a long-term service agreement with TfL. Train maintenance payments to Alstom, which includes amortised amounts for overhauls and refurbishments are wholly funded by TfL.
- 9.3 We have discussed with Alstom the opportunity for additional trains to the class 345 design and they have informed us that a production window exists at their Derby manufacturing facility, which is where the engineering and manufacture of the current class 345 fleet was undertaken. This would provide the most efficient and effective manufacturing solution for TfL, which may be impossible to achieve elsewhere.

## **10 Management of Programme**

- 10.1 We will build on the success of delivering the original order of 70 trains and will make use of the 'business as usual' Elizabeth line fleet management team to retain and extend key roles from the train delivery phase.
- 10.2 This means that the expertise and resource built up over time are retained and rolled from one project to another. This allows experience from the previous programme to be applied to manage risk, maximise value and minimise cost. This has proved a very effective way of managing risk and effective delivery.
- 10.3 We have a strong record of managing the delivery of rolling stock alongside other types of projects and all our projects and programmes follow 'Pathway', our project management and governance methodology.

## **11 Assurance**

- 11.1 The Independent Investment Programme Advisory Group and TfL Project Assurance undertook a full assurance review in October 2023. There are no critical issues, and four general recommendations are made.

**List of appendices to this report:**

Exempt supplementary information is included in a paper on Part 2 of the agenda.

**List of Background Papers:**

TfL Project Assurance Report and Management Response

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