Transport for London

Old Oak Overground Stations: Strategic Outline Business Case

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OVERGROUND

EVERY JOURNEY MATTERS

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Overall document Summary

- This document is the Strategic Outline Business Case for two potential new London Overground stations at Old Oak Common Lane and Hythe Road in the Old Oak area of west London

Context:

- The Old Oak and Park Royal Opportunity Area, in which the two potential London Overground stations would be located, could provide a £7 billion boost to London's economy. The Old Oak and Park Royal Opportunity Area Planning Framework suggests the area could accommodate 25,500 new homes and 65,000 jobs which would deliver a major contribution to London's housing and employment needs

The issue:

- The planned HS2/Elizabeth line/National rail station in Old Oak, upon which much of the proposed growth in homes and jobs in the area is predicated will open in 2026 and will provide a step change in connectivity nationally and regionally to and from the area. However, by itself this will not provide such a step change in connectivity to all surrounding communities nor will it serve the whole of the area
- Improved connectivity to the planned HS2/Elizabeth line/National rail station and wider Opportunity Area would help Old Oak fulfil its potential as a satellite to central London and better integrate the new growth and development with surrounding areas and the rest of London

Scheme objectives:

- The transport objective – to improve transport connectivity to the site and through interchange with HS2, Elizabeth line, and National rail services at the Old Oak Common HS2/Elizabeth line/National rail station
- The regeneration objective – to enhance the regeneration benefits that HS2/Elizabeth line/National rail services will bring to Old Oak

Case for the two new stations:

- The assessment of the new London Overground stations at Old Oak has confirmed that there is a positive business case for their delivery
- Subject to funding, the two new stations could open prior to, or at the same time as the HS2/Elizabeth line/National rail station opens, which is planned for 2026
- If the two stations are delivered together, the scheme would achieve a 'High Value for Money' with a benefit cost ratio of 2.2 to 1 including the wider economic benefits
- Delivery of Old Oak Common Lane alone including wider economic benefits would result in a benefit cost ratio of 3.5 to 1 which is considered 'High Value for Money'
- Delivery of Hythe Road station alone including wider economic benefits would deliver a benefit cost ratio of 1.4 to 1 which is 'Low Value for Money'

- If the costs of the viaduct are excluded, Hythe Road would have a positive business case with a BCR of 2.6 to 1 including wider benefits and demonstrating 'High Value for Money'

Financial impact:

- When both capital and operating costs are considered none of the three scenarios tested offer a position where revenue balances costs to both TfL and DfT
- For TfL, under all scenarios, although the new stations would generate additional revenue on London Overground, this would be offset by revenue reductions on other TfL modes to the extent that there would be an overall reduction in revenue to TfL
- Each scenario would also generate additional revenue for DfT. When this is considered alongside TfL revenues and operating costs (but excluding capital costs), Old Oak Common station alone would deliver a net profit over the appraisal period. Hythe Road station alone, and to a lesser extent both stations together would deliver a net loss over the appraisal period

Executive Summary

Section 1 Summary: Approach of the Strategic Outline Business Case

This document is the Strategic Outline Business Case for the two potential new London Overground stations at Old Oak

E.1. This Strategic Outline Business Case (SOBC) sets out the case for the two potential new London Overground stations at Old Oak. Throughout the document the scheme is referred to as the Old Oak Overground Stations (OOOS). It builds upon previous iterations of the Business Case for the scheme and reflects updated station design, transport modelling assumptions, cost updates and delivery assumptions.

E.2. As the project develops, the business case for the OOOS will be further refined to give greater confidence in delivery by the time an investment decision to deliver the stations is taken at the Full Business Case (FBC) stage. Subject to funding, it is anticipated that a Transport and Works Act Order (TWAO) process would need to be followed to obtain powers for construction and operation of the OOOS. A broad indicative timetable for the process is shown in Table 1.

Table 1: Indicative timetable of the key stages of the process of developing the scheme through to opening

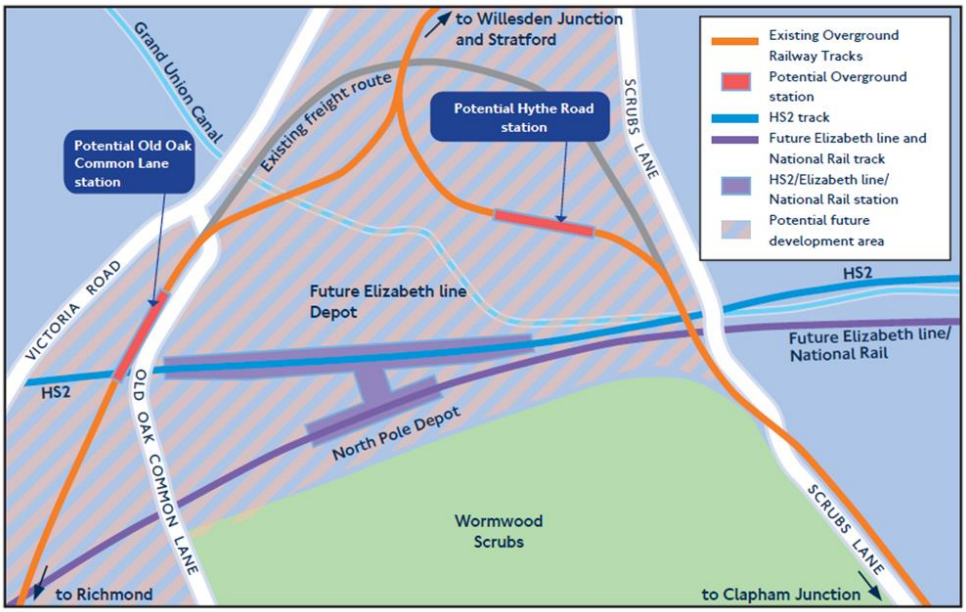
Activity	Date
Design	To 2020
Obtain TWAO	To 2022
Construction	To 2026
Opening	2026

The two new London Overground stations could open prior to, or at the same time as the HS2/Elizabeth line/National rail station opens, which is planned for 2026

E.3. A new Old Oak Common Lane station, on the North London Line (NLL), would be served by London Overground trains on the Stratford to Richmond route while a new Hythe Road station, on the West London Line (WLL), would be served by London Overground trains on the Stratford to Clapham Junction route.

E.4. Figure 1 shows the proposed locations of the two stations, and their proximity to the planned HS2/Elizabeth line/National rail station.

Figure 1: Proposed locations of the Old Oak Overground Stations



E.5. The OOOS aims to address the following objectives:

i. The transport objective – to improve transport connectivity to the site and through interchange with HS2, Elizabeth line, and National rail services at the Old Oak Common HS2/Elizabeth line/National rail station

ii. The regeneration objective – to enhance the regeneration benefits that HS2/Elizabeth line/National rail services will bring to Old Oak

E.6. The OOOS would provide high quality orbital public transport connections between the major commercial and residential development planned at Old Oak and areas of south west, west, and north London served by the existing London Overground routes, connecting areas that would otherwise be poorly served by the HS2 and Elizabeth line.

E.7. The OOOS assessed through this Strategic Outline Business Case reflects the scheme at the 'GRIP 3' level design as of November 2017 and is consistent with the information provided as part of the autumn 2017 public consultation which ran from 16 October 2017 to 17 November 2017.

E.8. To understand the full range of the Value for Money impacts, throughout the document three station combinations are assessed: both stations; Hythe Road station only and; Old Oak Common Lane station only.

E.9. The scope, costs and schedule for the delivery of the OOOS will be refined as the project moves forward and an Outline Business Case (OBC) is developed.

The DfT's five-case model for transport appraisal underpins the methodology of this document

E.10. The purpose of a business case is to provide evidence-based information in relation to investment programmes. Guidance for the preparation of Business Cases for Transport Schemes has been published by the Department for Transport (DfT)[1]. This is based on HM Treasury's advice on evidence-based decision making as set out in the Green Book[2] and uses the best practice five-case model approach.

E.11. This approach assesses whether schemes:

i. are supported by a robust case for change that fits with wider public policy objectives – the 'strategic case';
ii. demonstrate value for money – the 'economic case';
iii. are financially affordable – the 'financial case';
iv. are commercially viable – the 'commercial case'; and
v. are achievable – the 'management case'.

E.12. The evidence gathered as part of the business case preparation process has been prepared using the tools and guidance provided by the DfT notably WebTAG[3].

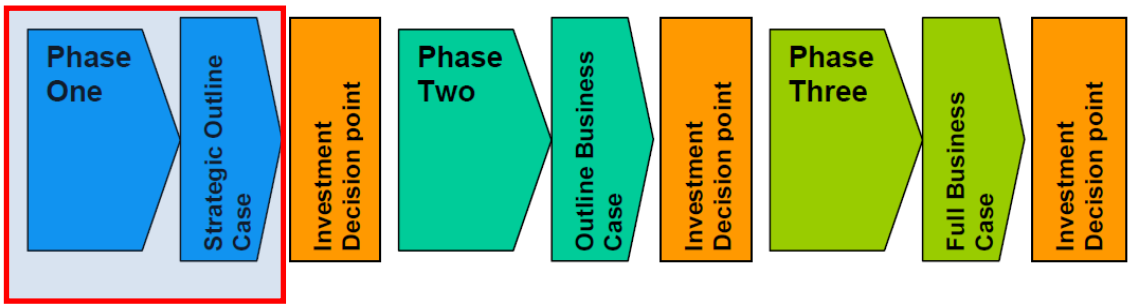
The decision making process is in three stages: Strategic Outline Business Case, Outline Business Case and Full Business Case

E.13. The decision making process, of which this Strategic Outline Business Case forms part, usually takes place in three phases. Each phase includes the preparation of a business case followed by an investment decision point.

E.14. Each business case builds upon that previously prepared. Evidence is reviewed to ensure that it remains up to date, accurate and relevant. The Strategic Outline Business Case is Phase One of this iterative process, with two further future stages of development to follow, as shown in Figure 2.

[1] DfT (2009)
[2] DfT (2009) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/85930/dft-transport-business-case.pdf
[3] DfT (2009) https://www.gov.uk/transport-analysis-guidance-webtag https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf

Figure 2: Decision making process



E.15. Phase One focusses on articulating the need for the intervention and summarising the range of options developed and considered.

E.16. This phase:

i. is used to set out the strategic fit of the project with achieving relevant national, London Mayoral and TfL policy objectives;
ii. confirms the strategic fit and the case for change;
iii. scopes out the initial investment/intervention proposal; and
iv. provides details of the project's overall balance of benefits and costs against objectives.

E.17. In the next stage, Phase Two, which, subject to the conclusions of this Strategic Outline Business Case and the confirmation of funding for further scheme development will follow over the course of 2018, TfL would reconfirm the conclusions from Phase One and will concentrate on a more detailed assessment, culminating in the preparation of an Outline Business Case, which would build on the Strategic Outline Business Case.

E.18. The final phase in the process, Phase Three, would result in the production of the Full Business Case – this will accompany a Transport and Works Act Order (TWAO) application which is required to gain consent for the scheme. Subject to funding for the scheme being confirmed and assuming the scheme continues to fit with the policy and operational requirements of TfL and other key stakeholders, a TWAO application could be submitted by 2020.

The Strategic Case element of this document is set out in five parts which is explained in sections 2 – 6 below

E.19. The Strategic Case sets out the need for the intervention, its aims and objectives and how these fit with the wider policy context. It provides suggested or preferred ways forward and presents the evidence for decisions taken at this stage. Alternatives to the proposed solution are also considered.

E.20. The strategic case element of this document is set out in five parts:

i. Strategic Case Part A: Evidencing the need for additional London Overground stations at Old Oak
ii. Strategic Case Part B: The Case for Change
iii. Strategic Case Part C: Determining the best option to meet the identified needs and so best deliver against the case for change
iv. Strategic Case Part D: Overview of the preferred option and sub-options
v. Strategic Case Part E: Strategic Policy Fit

Section 2 Summary: Strategic Case Part A - Evidencing the need for the new London Overground stations at Old Oak

London's growth and regeneration challenges

E.21. London is a global city and the UK's main engine of economic growth. London is currently at the top of a number of international city competitiveness rankings. This has resulted in strong employment growth, and a rapidly growing population. Since the mid-1990s there has been sustained growth in the capital's population and economy. Between 2005 and 2017 London's population grew from 7.5 million to 8.8 million. The number of private sector jobs within London has risen by 650,000 over the period 2005 to 2015 and the number of businesses has risen by 115,000 over the same period.

E.22. London's population is set to grow to around 10.5 million by 2041, a higher rate of growth than all other UK regions and the total number of jobs is forecast to increase by more than 1.2 million over the same period. Productivity is increasing, with London's economy, measured in Gross Value Added (GVA), forecast to grow by over 2.5 per cent a year. The rate of employment growth is strongest in inner London, with the majority of the forecast new jobs being created within the Central Activities Zones (CAZ). This will result in more commuting into the CAZ from Zones 2-6 and beyond.

E.23. If London is to continue succeeding as a World City it needs to provide a range of employment locations that between them allow it to respond effectively to emerging requirements in various growth sectors of the economy.

E.24. While employment in the high value service activities associated with its World City role is highly likely to remain heavily concentrated in the Central Activities Zone (CAZ), a small number of 'satellite centres' are also likely to be required, particularly for accommodating fast growing emerging sectors with large floorplate requirements. On the back on significant investment in transport and other infrastructure, such 'satellite centres' have already been developed at locations such as Canary Wharf and Stratford in east London, but not yet in west London.

E.25. The city's success and growth also pose continuing challenges for London and the transport system upon which it relies. The most significant of these is that over the past quarter of a century or so, a chronic undersupply of housing has emerged. A continued shortage of housing, where supply does not increase to meet growing demand would result in the affordability of housing continuing to worsen. If housing costs in London continue to rise, households would have less disposable income to spend on goods and services or would move out of the city and face long commutes from places outside London. Others might be discouraged from taking up new jobs in London. Building upon relatively high levels of investment in London's transport system in recent years, improving the connectivity of the system to unlock sustainable housing delivery in areas of strong development potential is a critically important means of addressing this.

E.26. The development of the Old Oak and Park Royal Opportunity Area could provide a £7 billion boost to London's economy. The Old Oak and Park Royal Opportunity Area Planning Framework suggests that the area could accommodate 25,500 new homes and 65,000 jobs which would deliver a major contribution to London's housing and employment needs.

E.27. The Old Oak and Park Royal Opportunity Area comprises a brownfield site covering 650 hectares of land, including over 135 hectares of developable land and straddles the boundaries of the three London boroughs of Brent, Ealing, and Hammersmith & Fulham.

E.28. The HS2/Elizabeth Line/ National rail station at Old Oak Common is to be delivered in 2026. Once open, it will provide direct services to Birmingham when Phase 1 opens in 2026; following the opening of Phase 2a in 2027 it will offer fast services to Crewe and the major cities of north west England and from 2033, when Phase 2b is due to open, it will offer direct high speed services to nine of the UK's ten largest urban areas, including the East Midlands, Sheffield and Leeds.

E.29. Much of the proposed growth in homes and jobs in the Old Oak area is predicated on this new station, which will provide a step change in connectivity nationally and regionally to and from the area. However, by itself this will not provide such a step change in connectivity to all the surrounding communities nor will it serve the whole of the area.

E.30. To capitalise on the delivery of the planned HS2/Elizabeth line/National rail station, a Mayoral Development Corporation, the Old Oak and Park Royal Development Corporation (OPDC) was established in 2015 to lead on the regeneration and transformation of the area.

E.31. To achieve the ambitious scale of development, high density new development and appropriate complementary transport provision in addition to the planned HS2/Elizabeth line/National rail station will be vital to allow residents, workers and visitors to travel to and from Old Oak in a sustainable manner.

E.32. In particular, planning for further transport provision will be needed in order to enhance the accessibility to public transport services from most areas within the Old Oak area.

The HS2/Elizabeth line/National rail station will provide a step change in connectivity nationally and regionally to and from Old Oak, but will not provide this step change to all the surrounding communities

E.33. The HS2/Elizabeth line/National rail station will provide direct services to Birmingham from 2026; north west England from 2033 and to nine of the UK's ten largest urban areas by 2033. Rail services on the Great Western Main Line (GWML) will also provide direct regional and long distance trains to a range of locations west of London such as Reading, Bristol, South Wales and the Southwest of England.

E.34. The west-east Elizabeth line (previously known as Crossrail) will provide direct connectivity between the Old Oak area and the West End, the City, Canary Wharf and Heathrow Airport. The vast majority of central London will be accessible directly or via a single interchange between the Elizabeth line and the London Underground network.

E.35. The HS2/Elizabeth line/National rail station will transform cross-London and longer distance connectivity but it has primarily been designed as an interchange to meet HS2 requirements rather than to address the full range of connectivity requirements associated with the sustainable development of the area surrounding the station.

E.36. In particular, two orbital railway lines pass through the area, carrying existing London Overground (LO) passenger services: the North London Line (NLL) carries services between Stratford and Richmond and the West London Line (WLL) joins this to provide services between Stratford and Clapham Junction. The nearest existing station to the planned HS2/Elizabeth line/National rail station that is served by LO services would be Willesden Junction (both WLL and NLL), which is located 1.5km away with no convenient rail links or means for passengers to interchange between the two.

E.37. It is these gaps in provision that this scheme aims to close, to enable new residents of Old Oak to better access services at key centres such as Shephard's Bush, Richmond and Clapham Junction and other parts of London and surrounding communities to better access the employment opportunities at Old Oak.

Section 3 Summary: Strategic Case Part B – The Case for Change

E.38. Overall, the case for change at Old Oak, is set out in two parts:

i. Part 1 – the role of the OOOS in addressing London's economic growth and regeneration challenges;
ii. Part 2 – the role of the OOOS as a driver of improved connectivity within west London, across all of Greater London and on to HS2.

Part 1: The role of the OOOS in addressing London's economic growth and regeneration challenges

E.39. Extending CAZ-like employment opportunities to Canary Wharf since the 1990s, and more recently to Stratford off the back of the London 2012 Games and investment in strong transport connectivity has shown that in certain circumstances, complementing the CAZ with satellite centres with access to space and human capital can and is helping London to continue its growth as a World City.

E.40. The area covered by the OPDC possesses a number of attributes which would enable it to function as a CAZ satellite centre in a similar way to Canary Wharf and Stratford subject to the provision of similar levels of investment and transport connectivity:

i. There is a sufficiently large area of brownfield land available for the development of a significant cluster of commercial development;
ii. The site is in close physical proximity to central London; and

iii. There is planned provision for long distance and radial cross-London transport at the HS2/Elizabeth line/National rail station, which will be served by the Elizabeth line services and Great Western as well as HS2 trains. This will provide improved connectivity with other employment centres including the CAZ, Canary Wharf, Stratford, and all the main regional cities, as well as a very fast link to Heathrow Airport.

E.41. However, local connectivity challenges remain to the immediately surrounding areas, particularly from the planned HS2/Elizabeth line/National rails station to north, south and south west London. The radial network enabled by the OOOS would help to address the local connectivity challenges at Old Oak and therefore help Old Oak to achieving the CAZ satellite status.

E.42. Old Oak has strong potential to be a sustainable residential development in the heart of west London but needs better connectivity and accessibility to attain its full potential. The area has the capacity to deliver significant housing growth but poor levels of public transport accessibility and connectivity across the area will need to be addressed if this potential is to be fully realised and if the growth is to be aligned with 'good growth' principles.

E.43. If connectivity at Old Oak with the Overground network could be maximised, this will also be of benefit to HS2/Elizabeth line/National rail passengers as journey times and the cost of travel to access these routes will be reduced from some parts of north, north west and south west London, by providing quicker, cheaper alternatives to travelling via central London.

E.44. Old Oak and Park Royal is the largest regeneration project in the UK since the regeneration of East London as part of the London 2012 Games. It is not just the size and potential of the opportunity area that makes it unique; it will also be the only place where HS2 will meet the Elizabeth line providing the area with unique opportunities to unlock further development and growth. This presents a once in a lifetime opportunity for physical and economic regeneration, transforming one of London's most inaccessible areas into a well-connected, world-class transport interchange, with high quality new housing and commercial development, surrounded by sustainable and thriving neighbourhoods and valued amenity space.

E.45. Improving local connectivity to Old Oak from all directions is critical to help maximise the opportunities for regeneration of the area. As part of the station proposals, new high quality pedestrian and cycle links will be provided across the Old Oak development area connecting to Victoria Road and the main HS2/Elizabeth line/National rail transport hub.

E.46. The HS2/Elizabeth line/National rail station at Old Oak Common will in itself be a major catalyst for the regeneration of the area; however, given the scale of the OPDC area, the OOOS will enhance the ability to achieve its full regeneration potential.

E.47. The OOOS have the ability to help facilitate the large scale regeneration planned at Old Oak. If the opportunity to connect Overground services to the area was to be missed the full scale of regeneration would not be fully realised. It is anticipated that this infrastructure investment will encourage further transformation and regeneration within the OPDC region.

E.48. The viability of many of the development sites would be enhanced by the OOOS and the supporting transport measures (e.g. enhanced bus service levels) and the community facilities delivered by the OPDC Masterplan.

E.49. The OOOS would support the delivery of new employment-generating floor space. The Development Capacity Study prepared by the OPDC proposes the provision of 56,700 square metres of retail/leisure floor space and 683,600 square metres of B1 (business use) floor space overall, which will enable the 65,000 jobs in the area.

E.50. The OOOS would generate an additional 1,500 Full Time Equivalent (FTE) jobs including direct, indirect and induced employment[4] from local to the national level. Of the 1,500 FTE employment, 830 are expected to be new direct jobs, either at the stations during construction or in the operation of the train service if both Hythe Road and Old Oak Common Lane stations were constructed. The remainder would be indirect and induced jobs including employment within the new non-residential floor space.

E.51. The OOOS would also generate additional residential units, which would translate into around 200 homes in the area. Further to the stations themselves, the viaduct at Hythe Road would also unlock developable land and enable a further number of homes to be developed. The additional residents living in the development area near Hythe Road enabled by the new station would then create demand for goods and services, which in turn will create jobs in the locality.

[4] Homes and Communities Agency (2014) HCA Additionality Guide, Fourth Edition
This estimate of operational employment was calculated using employment densities drawn from the HHC Employment Densities Guide. Assumptions relating to leakage, displacement and multipliers have been drawn from this document.
:https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/378177/additionality_guide_2014_full.pdf

E.52. An analysis of the potential land value uplift associated with the OOOS has identified a positive relationship between new stations and the land values. The analysis has identified that the two new Overground stations could potentially generate an increase in land values of between £168 million and £285 million.

E.53. Access to labour markets, access to customers and affordability all influence where businesses choose to locate. By supporting the delivery of new housing and commercial development, OOOS would assist with the creation of a new community, which will bolster and diversify the local labour market. Combined with better connectivity, the OOOS would therefore enhance the area's attractiveness to investment, supporting economic growth and regeneration within and beyond Old Oak.

Part 2: The role of OOOS as a driver of improved connectivity within west London, across all of Greater London and on to HS2

E.54. In order to fully realise the potential growth and regeneration of Old Oak, it is important to address shortcomings in orbital transport connectivity to maximise the areas full potential.

E.55. Linking the HS2/Elizabeth line/National rail station at Old Oak Common with the Overground network through two new stations at Hythe Road and Old Oak Common Lane has many benefits, both to the HS2 and Elizabeth line projects and to west London more broadly, by the creation of enhanced opportunities for strategic rail interchange between radial and orbital networks.

E.56. The OOOS would provide improved accessibility to Old Oak, particularly from south and south west London. Key beneficiaries of the scheme would be residents and firms based in London Borough (LB) of Richmond, with large swathes of the borough benefiting from journey time savings in excess of 20 minutes. Other beneficiaries of the project include residents and firms based in the boroughs of Kingston, Sutton, Croydon, Merton, Wandsworth, Hounslow, Harrow, Barnet, Brent and Camden.

E.57. In addition, the OOOS would allow HS2 and Elizabeth line passengers access to a wide range of fully accessible routes, with many stations on the London Overground network being step-free. Moreover, a London Overground connection at Old Oak could result in five airports (two more than without the OOOS) being within 45 minutes of Old Oak: Heathrow, Gatwick, Luton, London City and Birmingham.

E.58. In east London there will be excellent interchange opportunities with the Elizabeth line at locations such as Stratford, Canary Wharf and Whitechapel and including many of the newer orbital links provided by the DLR and London Overground that have benefitted from significant investment in the last 25 years.

E.59. In contrast, there are far fewer opportunities for interchange on the Elizabeth line in west London – the only orbital 'feeder' route into the Elizabeth line is the short national rail link between Greenford and West Ealing.

E.60. Local connections at Old Oak would reduce a certain degree of pressure on Euston. The effects of providing the OOOS will result in a marginal reduction in passengers at Euston in 2041. However, this overall reduction in passenger numbers represents a benefit in terms of reduced pressure on the crowded Underground and bus networks serving the station.

E.61. The OOOS would help to deliver regeneration, economic, housing and transport benefits to London, bringing better connectivity and better prospects not just to west London but to London as a whole

E.62. Sections 2 and 3 have demonstrated a clear case for change. Multiple benefits would be delivered by providing interchange at Old Oak between the already planned HS2 and Elizabeth line services, and the London Overground.

Section 4 Summary: Strategic Case Part C - Determining the best option to meet the identified needs and so best deliver against the case for change

Before considering a range of potential options for transport infrastructure, there is a need to identify the core objectives and outcomes

E.63. There are two overarching objectives set out in Table 2 alongside the benefits which indicate how the success of the project can be measured.

Table 2: Objectives and benefits criteria for the OOOS

Objective	Main benefits
Transport Objective: Improve transport connectivity to the site and through interchange with HS2, Elizabeth line, and National rail services at the Old Oak Common HS2/Elizabeth line/National rail station	The OOOS would create orbital links between north, west and south west London and the Old Oak area along with new interchange opportunities with services available at the HS2/Elizabeth line/National rail station. The OOOS could bring more people within an hour of Old Oak whilst also improving links to other Opportunity Areas (OAs).
Regeneration Objective: Enhance the regeneration benefits that HS2/Elizabeth line/National rail services will bring to Old Oak	Large scale development at Old Oak will only take place if excellent transport connections are provided to a range of destinations within and beyond the Old Oak area. The new HS2/Elizabeth line/National rail station at Old Oak Common and the proposed London Overground stations will act as an enabler of growth in the immediate OA. The new stations could help facilitate large scale regeneration at Old Oak with up to 65,000 additional jobs and 25,500 homes created in the area. These benefits could be maximised by providing additional London Overground stations in the vicinity of the OA, which could increase the connectivity between railway services; creating more convenient connectivity to a wider range of destinations; and providing access to a range of rail services for residents, occupiers and visitors within the regeneration area.

E.64. A feasibility study into potential orbital connections at Old Oak, linking to the planned HS2/Elizabeth line/National rail station was completed jointly by HS2 Ltd, TfL and Network Rail, during 2010. This considered options related to the NLL and WLL of the London Overground, the London Underground Central and Bakerloo lines, new modes of transport, links to existing stations such as Willesden Junction and combinations thereof. Following the feasibility study, it was concluded that a London Overground solution was the preferred option to provide orbital connections to the HS2/Elizabeth line/National rail station and the Old Oak area.

E.65. A further study at the Network Rail (NR) Guidelines for Railway Improvement Projects (GRIP) stage 2 was then undertaken on behalf of TfL and Network Rail in 2013. This work considered a long list of 27 distinct options developing a shortlist of five options.

E.66. Following the study, three options were identified to be taken forward to public consultation. The three options identified were:

i. **Option A**: a new viaduct running to the north of Wormwood Scrubs, allowing West London Line (WLL) trains to join the North London Line (NLL), just south of Acton Wells Junction, with a single new station on the NLL adjacent to Old Oak Common Lane;
ii. **Option B:** WLL trains use the existing South West Goods lines to access a single new station on the NLL adjacent to Old Oak Common Lane, where WLL trains would reverse to continue their journey; and
iii. **Option C**: two separate stations, one on the NLL adjacent to Old Oak Common Lane and another on the WLL adjacent to Hythe Road, with pedestrian links to the HS2/Elizabeth line/National rail station.

E.67. Public consultation was undertaken in late 2014 to gauge support for both Overground connectivity at Old Oak in general and to gain an understanding of public support for the three options identified. Of the 1,200 responses, 95 per cent either supported or strongly supported the general proposition.

E.68. Option C was the most popular with respondents, with 59 per cent of respondents supporting or strongly supporting this. In addition, Option C had the lowest levels of opposition (18 per cent of responses either opposing or strongly opposing it).

E.69. Since Option C was selected in March 2015, further design development was undertaken during 2016 and 2017 to consider different design options for each of the stations within option C.

E.70. The options considered for Old Oak Common Lane station are as set out below:
i. **Option 2A** – Old Oak Common Lane station with a sub-surface concourse. A grade level station with a low level concourse and its associated pedestrian links. The concourse will straddle the alignment of a HS2 subway.
ii. **Option 2B** – Old Oak Common Lane station with a high level concourse. A grade level station with a high level concourse and pedestrian links.

E.71. The options considered for Hythe Road station are as set out below:
i. **Option 1A** – Hythe Road station on existing embankment with connections (underpasses). Railway retained on its existing alignment with the station constructed on widened earthworks. Permeability of the embankment increased to development traffic by the provision of a minimum of three box culvert bridges as part of the proposal.
ii. **Option 1B** – Hythe Road station on a viaduct northern variant. Railway re-aligned onto a viaduct north of the existing embankment and designed as an elevated station.

iii. **Option 1C** – Hythe Road station on a viaduct southern variant. Railway re-aligned onto a viaduct south of the existing embankment and designed as an elevated station.

E.72. Each of the station design options was then assessed to determine the preferred option at each location. The Business Case assessment showed that all sub options for Hythe Road station (1A to 1C) had a similar Value for Money (VfM) rating while option 2B for Old Oak Common Lane station had a significantly better VfM case than option 2A. In operations terms, there was a marginal technical and operational preference for Option 1C the southern viaduct at Hythe Road station.

E.73. At Hythe Road station, given the wider objectives for the Old Oak area, which were reflected by stakeholders including the OPDC and London & Regional about Option 1C the southern viaduct (and TfL's aim to ensure sustainable transport options across the area to complement rail access), it was determined that Option 1B, the northern viaduct option, was preferred.

E.74. At Old Oak Common Lane station, due to the high costs, lower VfM and anticipated construction impact of building Option 2A the underpass on the existing operational railway; Option 2B the overbridge was preferred.

E.75. The designs of the preferred options have subsequently been further developed and refined. The options assessed in this business case are based on the GRIP 3B design of Option 1B for Hythe Road and Option 2B for Old Oak Common Lane.

E.76. A public consultation was held in late autumn 2017. This presented the preferred options of 1B for Hythe Road station and 2B for Old Oak Common Lane station alongside supporting information setting out the pros and cons of all design options considered. Of the 911 responses to the public consultation:

i. 94 per cent of respondents supported or strongly supported the provision of both stations
ii. 92 per cent of respondents supported or strongly supported the provision of Old Oak Common Lane station
iii. 86 per cent of respondents supported or strongly supported the provision of Hythe Road station
iv. 88 per cent of respondents supported or strongly supported the provision of a link between Old Oak Common Lane station and Victoria Road

Section 5 Summary: Strategic Case Part D - Summary of the preferred option C and sub-options 1B and 2B

The assessed scheme involves the construction of a new station at Old Oak on each of two orbital railway lines that pass through the area, carrying existing London Overground (LO) passenger services

E.77. Old Oak Common Lane Station, on the North London Line (NLL), would be served by LO trains on the Stratford to Richmond route while Hythe Road Station, on the West London Line (WLL), would be served by LO trains on the Stratford to Clapham Junction route. Figure 1 shows the proposed locations of the two stations.

E.78. The OOOS would provide high quality orbital public transport connections between the major commercial and residential development planned at Old Oak and areas of south west, west, and north London served by the existing LO routes.

E.79. These areas would not be as easily accessed through rail services available at the planned Old Oak Common HS2/Elizabeth line/National rail station. The OOOS would also offer these wider areas of London improved connections to other locations by providing opportunities for interchange with the radial cross-London and long distance services available at the HS2 station.

E.80. Further orbital connectivity could also be provided through the OOOS in the future if potential new Overground routes between Old Oak and areas such as Brent Cross and Hounslow are developed.

Section 6 Summary: Strategic Case Part E - Strategic Policy Fit

E.81. The preferred option C and sub-options 1B and 2B deliver against European, national, London-wide, ODPC and local policy objectives including the Trans European Transport Network – Connecting Europe Core Network, the National Planning Policy Framework, London Plan, Mayors Transport Strategy and Old Oak and Park Royal Opportunity area Planning Framework.

Section 7 Summary: Economic Case

E.82. Although both stations deliver benefits, it is apparent that each serves somewhat different and distinct purposes. Old Oak Common Lane meets a need of providing interchange with HS2 at Old Oak Common, with more than half of the station demand coming from the HS2/Elizabeth line/National rail station complex.

E.83. In contrast, Hythe Road has nearly 40 per cent of its demand coming from the Old Oak development.

E.84. The economic appraisal results for each option are summarised in Table 3.

Table 3: Economic Appraisal Summary (£m, PV, 2010 prices)

	DS1: Old Oak Common Lane and Hythe Road		DS2: Hythe Road Only		DS3: Old Oak Common Lane Only	
Present Value of Costs (PVC)	300		194		105	
	TfL VoT	DfT VoT	TfL VoT	DfT VoT	TfL VoT	DfT VoT
Initial Present Value of Benefits (PVB)	496	444	201	180	304	271
Initial Net Present Value (NPV)	196	144	7	-14	199	166
Initial Benefit Cost Ratio (BCR)	1.7 to 1	1.5 to 1	1.1 to 1	0.9 to 1	3 to 1	2.7 to 1
Wider Economic Impacts	152	152	76	76	66	66
Adjusted Present Value of Benefits (PVB)	648	596	277	256	370	337
Adjusted Net Present Value (NPV)	348	296	83	62	265	232
Adjusted Benefit Cost Ratio (BCR)	2.2 to 1	2.0 to 1	1.4 to 1	1.3 to 1	3.5 to 1	3.2 to 1
Move to More Productive Jobs	-237 to 197		-65 to 124		-172 to 73	
Dependent Development	-9 to 52		-5 to 31		-4 to 20	

Delivering both Old Oak Common Lane and Hythe Road stations alongside the HS2/Elizabeth line/National rail station complex provides High Value for Money

E.85. When the two stations are delivered together, the scheme would achieve a 'High Value for Money' with a benefit cost ratio of 2.2 to 1 including wider economic benefits and using London values of time. There is only a relatively small increase in the total service operating costs of £2.1 million.

E.86. Additional station operating costs borne from the OOOS are estimated based on experience of costs from the existing London Overground concession for equivalent stations. These costs total £0.7 million, which combined with the service costs gives a total operating cost of £2.5 million per annum in 2016 prices.

E.87. This additional demand is forecast to generate £12 million (PV, 2010 prices) in revenue over the appraisal period with £5 million from Hythe Road and £8 million from Old Oak Common Lane.

Delivering Old Oak Common Lane station only alongside the HS2/Elizabeth line/National rail station provides High Value for Money

E.88. The capital cost for Old Oak Common Lane is £130.6m in 2016 prices including risk and property compensation. The outturn cost, which includes inflation between 2016 and the year of construction (2025), is £182.5m.

E.89. The economic case for Old Oak Common Lane is heavily influenced by HS2 demand.

E.90. The full scale of development of the Old Oak area and the wider economic benefits would result in a benefit cost ratio of 3.5 to 1 which is considered 'High Value for Money' using London values of time and if wider economic benefits are taken into account. This is greater than if the station were delivered alongside Hythe Road station.

Delivering Hythe Road station only alongside the HS2/Elizabeth line/National rail station would only provide High Value for Money if the costs of the viaduct element of the scheme are excluded

E.91. The capital cost for Hythe Road station is £185.7m in 2016 prices including risk and property compensation. The outturn cost, which includes inflation between 2016 and the year of construction (2022), is £227.6m.

E.92. The economic case for Hythe Road station is strongly influenced by the development demand. With the full scale of development as set out in the OPDC's Opportunity Area Planning Framework (OAPF) and wider economic benefits this would deliver a benefit cost ratio of 1.4 to 1 which is 'Low Value for Money' using London values of time.

E.93. If the costs of the viaduct are excluded, Hythe Road would however have a positive business case with a BCR of 2.6 to 1 including wider benefits and demonstrating 'High Value for Money'.

Delivering both Old Oak Common Lane and Hythe Road stations without the HS2/Elizabeth line/National rail station being in place is unviable

E.94. This assessment of the OOOS has confirmed that there is no case for either station without HS2 or the development of the Old Oak area taking place.

Section 8 Summary: Financial Case

E.95. The Financial Case sets out the project and ongoing operating costs, and financing and funding arrangements to deliver the scheme.

E.96. The capital cost including the land compensation for Hythe Road is £185.7m in 2016 prices. The outturn cost, which includes inflation between 2016 and the assumed year of construction (2022), is £227.6m. The capital cost including the land compensation for Old Oak Common Lane is £130.6m in 2016 prices. The outturn cost, which includes inflation between 2016 and the assumed year of construction (2025), is £182.5m. For both stations inflation is estimated at 4 per cent per year. (Note that a level of optimism bias of 64 per cent has been assumed for the purposes of the business case. The level of optimism bias will be reduced as the project advances).

E.97. There is a only a small overall increase in the number of train miles operated per annum as a result of extending some Southern services from Shepherds Bush to Hythe Road, and therefore there is only a relatively small increase in the total service operating costs of £1.74 million (2016 prices). The number of unit miles per annum increases by approximately 16,000 overall.

E.98. Additional station operating costs borne from the OOOS are estimated based on experience of costs from the existing London Overground concession for equivalent stations. These costs total £0.7 million, which combined with the service costs gives a total operating cost of £2.5 million per annum in 2016 prices.

E.99. The two new stations improve the accessibility at Old Oak and also provide easy access to HS2 and the Elizabeth line services. This change in network connectivity will generate additional demand on the network due to passengers switching from cars. This additional demand is forecast to generate £12 million (PV, 2010 prices) in revenue over the appraisal period with £5 million from Hythe Road and £8 million from Old Oak Common Lane.

E.100. A financial assessment has been undertaken over a 15 year time horizon from the start of revenues being received and operating costs being incurred in 2025. This length of time has been used as it reflects the period over which revenue forecasts have been modelled and is also before significant renewal costs are incurred at each of the stations.

E.101. The financial assessment is heavily dependent on non-controllable economic factors such as Retail Price Index (RPI) growth and also variables such as fares policy over which there is some certainty.

E.102. This should be borne in mind when considering the potential variability of forecasts over time and that there is a degree of uncertainty as to the future. The financial assessment has used TfL Business Planning RPI assumptions to convert into actual prices over time. No fares growth has been assumed and revenues are assumed to rise in line with RPI.

E.103. The details of the financial assessment for the three scenarios are summarised below.

E.104. If Old Oak Common Lane station alone is delivered:

i. The station would generate additional London Overground revenues of +£55.4m over 15 years.
ii. The increase in Overground revenues would be offset by a reduction in revenues on other TfL modes resulting in a net reduction in TfL revenue of -£5.8m over 15 years. The reduction in revenues overall is explained by people being able to make more direct journeys and not having to route via Zone 1 with its higher fares.
iii. TfL would incur capital and operating costs of £141m over the 15 year assessment period.
iv. The net TfL position in terms of costs versus revenues would be a funding gap over 15 years of -£147m.
v. The DfT would not incur any additional costs but stands to gain a small amount of additional revenue of +£31m over 15 years.
vi. The net position to both TfL and DfT in combination would be a funding gap of -£116m over 15 years, assuming the additional DfT revenues could be used in the net position against costs.
vii. Excluding capital costs, the net position to both TfL and DfT would be a funding surplus of +£16m over 15 years.

E.105. If Hythe Road station alone is delivered:

i. The station would generate additional Overground revenues of +£32.2m over 15 years.
ii. The increase in London Overground revenues would be offset by a reduction in revenues on other TfL modes resulting in a net reduction in TfL revenue of -£27.6m over 15 years. The impact of a loss of Zone 1 related revenue due to rerouting is greater than in the case of Old Oak Common Lane.
iii. TfL would incur capital and operating costs of £205m over the 15 year assessment period.
iv. The net TfL position in terms of costs versus revenues is a funding gap over 15 years of -£232m.

v. The DfT would incur additional costs of -£30.8m over 15 years due to the extension of Southern services to Hythe Road. The DfT will gain +£41m in additional revenue over 15 years, giving a positive net position of revenue/costs of +£10.2m.
vi. The net position to both TfL and DfT in combination would be a funding gap of -£222.6m over 15 years assuming that the additional DfT revenues could be used in the net position against costs.
vii. Excluding capital costs, the net position to both TfL and DfT would be a funding gap of -£23m over 15 years.

E.106. If both Old Oak Common Lane station and Hythe Road station together are delivered:

i. The stations would generate additional London Overground revenues of +£86.7m over 15 years.
ii. The increase in London Overground revenues would be offset by a reduction in revenues on other TfL modes resulting in a net reduction in revenue of -£32.2m over 15 years.
iii. TfL would thus incur capital and operating costs of £346m over the 15 year assessment period.
iv. The net TfL position in terms of costs versus revenues would be a funding gap over 15 years of -£378m.
v. The DfT would incur additional costs of -£30.8m over 15 years due to the extension of Southern services to Hythe Road, but would gain +£72m in additional revenue over 15 years, giving a positive net position of +£41.3m.
vi. The net position to both TfL and DfT in combination would be a funding gap of -£337m over 15 years assuming that the additional DfT revenues could be used in the net position against costs.
vii. Excluding capital costs, the net position to both TfL and DfT would be a funding gap of -£5m over 15 years.

E.107. The financial assessment has demonstrated that Old Oak Common Lane delivered in isolation offers the best position to both DfT and TfL in terms of the smallest net revenue and cost gap when both capital and operating costs are considered and a funding surplus if capital costs are excluded. Consideration should be given to other funding sources such as a developer contribution in the case of Hythe Road and an attempt to capture the DfT revenue benefits in the form of a contribution towards costs. Old Oak Common Lane potentially offers the worst position in terms of developer contribution as a significant proportion of passengers are HS2 transfers as opposed to demand from the OPDC development.

E.108. If the scheme is to progress, a full funding package will need to be identified in advance of TfL submitting a TWAO application, potentially by 2020.

E.109. TfL will be working closely with the OPDC as part of the OPDC's wider development of the costs and funding sources for transport and other infrastructure across the site, to gain a better understanding of the funding opportunities for the new stations.

E.110. The potential funding sources which could make up a funding package are summarised in Table 4.

Table 4: Summary of potential funding source

Likelihood of funding	Potential funding source
	Developer contributions via S106 agreement
	OPDC CIL
	TfL Business Plan funding
	Central Government grant funding

	Funding source from which a contribution is most likely given effect of infrastructure on land and property values
	Funding source from which a contribution could be sought but would be subject to prioritisation and/or lobbying

Section 9 Summary: Commercial Case

E.111. The OOOS is currently being developed by TfL supported by the OPDC and Network Rail, and involving close working with other stakeholders including the relevant local authorities (the London Boroughs of Brent, Ealing and Hammersmith & Fulham), statutory authorities (such as affected utilities) and impacted land owners. The infrastructure owner, Network Rail, is fully engaged with the project.

E.112. The development of the stations has been undertaken in accordance with Network Rail's GRIP process and they have provided 'Approval in Principle' (AiP) to the GRIP3 scheme design across all disciplines.

E.113. At this stage in the project's development it is too early to identify the commercial structure and therefore the likely accounting treatment. It is therefore also not clear whether any liabilities would score against TfL borrowing. This area of uncertainty will become clearer as the project is developed further.

Section 10 Summary: Management Case

E.114. The OOOS is a complex rail infrastructure scheme, promoted and supported by experienced professional bodies responsible for transport in London and the impacted local areas. However, subject to funding being identified and the completion of the OPDC masterplan by summer 2018, an indicative programme identifies that the earliest possible date for a TWAO submission is 2020.

E.115. The detailed programme beyond this date has not been confirmed due to uncertainties over funding and the completion of the OPDC masterplan.

E.116. If it was decided to progress Hythe Road station for delivery by 2023, then following TWAO approval a contractor could be appointed in 2021 with construction complete by 2023. The likely date for delivery of Old Oak Common Lane station is 2026, to align with the delivery of the HS2 and Elizabeth line station at Old Oak Common.

Section 11 Summary: Conclusions

E.117. Delivering the OOOS, with two new London Overground stations at Old Oak with the HS2/Elizabeth line/National rail station in place, would deliver regeneration, economic, housing and transport benefits to London, bringing better connectivity and better prospects not just to west London but London as a whole. This is illustrated in Table 5.

Table 5: Summary of how each option aligns with the scheme objectives

Objectives	DS1: Old Oak Common Lane and Hythe Road	DS2: Hythe Road Only	DS3: Old Oak Common Lane Only
Transport Objective: Improve transport connectivity to the site and through interchange with HS2, Elizabeth line, and National rail services at the Old Oak Common HS2/Elizabeth line/National rail station	OOOS would create orbital links between N / W / SW London and the site along with new interchange opportunities with services available at the HS2/Elizabeth line/National rail station. OOOS could bring more people within an hour of Old Oak whilst also including links to other Opportunity Areas (OAs) and generating a transport user benefits of £500 million over the appraisal period.	Hythe Road would create orbital links between N / W / SW London and serve the demand for the planned developments at Old Oak. Of the three options, Hythe Road would generate the lowest transport user benefits of £200 million over the appraisal period.	Old Oak Common Lane would create orbital links between N / W / SW London and the site along with new interchange opportunities with services available at the HS2/Elizabeth line/National rail station. Old Oak Common Lane would generate a transport user benefit of £300 million over the appraisal period, making it the second best option amongst the three options.

Objectives	DS1: Old Oak Common Lane and Hythe Road	DS2: Hythe Road Only	DS3: Old Oak Common Lane Only
Regeneration Objective: Enhance the regeneration benefits that HS2/Elizabeth line/National rail services will bring to Old Oak	The new HS2/Elizabeth line/National rail station at Old Oak Common and the proposed London Overground stations will act as an enabler of growth in the immediate OA. The new stations could help facilitate large scale regeneration at Old Oak with up to 65,000 additional jobs and 25,500 homes created in the area. These benefits could be maximised by providing additional London Overground stations in the vicinity of the OA, which could increase the connectivity between railway services and creating more convenient connectivity to a wider range of destinations and providing access to a range of rail services for residents, occupiers and visitors within the regeneration area. The two stations would bring 200 additional housing units to the vicinity of the stations and would also generate 1510 Full Time Equivalent employment.	The new HS2/Elizabeth line/National rail station at Old Oak Common and the proposed Hythe Road station will act as an enabler of growth in the immediate OA. Hythe Road station would bring 120 additional housing units to the vicinity of the station and would also generate 710 Full Time Equivalent employment. The station and the viaduct of the station in particular, would enable the opportunity for more housing developments.	The new HS2/Elizabeth line/National rail station at Old Oak Common and the proposed Old Oak Common Lane will act as an enabler of growth in the immediate OA. Old Oak Common Lane would bring 80 additional housing units to the vicinity of the station and would also generate slightly more (800) Full Time Equivalent employment compared to Hythe Road station.

E.118. Financially, none of the three scenarios tested offer a position where revenue balances all costs to both DfT and TfL, however Old Oak Common station alone would deliver a funding surplus if capital costs are excluded.

E.119. The detailed programme beyond 2017 has not been confirmed due to uncertainties over funding and the completion of the OPDC masterplan. However, subject to funding being identified and the completion of the OPDC masterplan by summer 2018, an indicative programme to 2026 was provided.

E.120. The programme identifies that the earliest possible date for a Transport & Works Act Order (TWAO) submission would be 2020.

E.121. The infrastructure owner, Network Rail, is fully engaged with the project and the development of the stations has been undertaken in accordance with Network Rail' s GRIP process and they have provided 'Approval in Principle' (AiP) to the GRIP3 scheme design across all disciplines.

E.122. The procurement route for the next stage of project, through the development and submission of a TWAO and then on to the construction stage is yet to be confirmed, with a number of options under consideration.

E.123. If it was decided to progress Hythe Road station for delivery by 2023, then following TWAO approval a contractor could be appointed in 2021 with construction complete by 2023. The earliest likely date for delivery of Old Oak Common Lane station is 2026.

Section 1: Approach of the Strategic Outline Business Case

Section Summary:

- **This document is the Strategic Outline Business Case for the proposal of two additional stations at Old Oak in west London**
- **TfL aims to open the two new Overground stations at the same time as the HS2 and Elizabeth line station at Old Oak Common opens, which is planned for 2026**
- **This business case shows how the proposal:**

i. ***is supported by a robust case for change that fits with wider public policy objectives – the 'strategic case';***

ii. ***demonstrate value for money – the 'economic case';***

iii. ***are commercially viable – the 'commercial case';***

iv. ***are financially affordable – the 'financial case';*** **and**

v. ***are achievable – the 'management case'.***

- **The DfT's five-case model for transport appraisal underpins the methodology of this document**
- **The decision making process is in three stages: Strategic Outline Business Case, Outline Business Case and Full Business Case**

This document is the Strategic Outline Business Case for two potential new London Overground stations in the Old Oak area of west London

1.1. This Strategic Outline Business Case (SOBC) sets out the case for the two potential new London Overground stations at Old Oak. Throughout the document the scheme is referred to as the Old Oak Overground Stations (OOOS).

1.2. This SOBC builds upon previous iterations of the Business Case for the scheme and reflects updated station design, transport modelling assumptions, cost updates and delivery assumptions.

1.3. As the project develops, the business case for the OOOS will be further refined to give greater confidence in delivery by the time an investment decision to deliver the stations is taken at the Full Business Case (FBC) stage.

1.4. Subject to funding, it is anticipated that a Transport and Works Act Order (TWAO) process would need to be followed to obtain powers for construction and operation of the OOOS. A broad indicative timetable for the process is shown in Table 6.

Table 6: Indicative timetable of the key stages of the process of developing the scheme through to opening

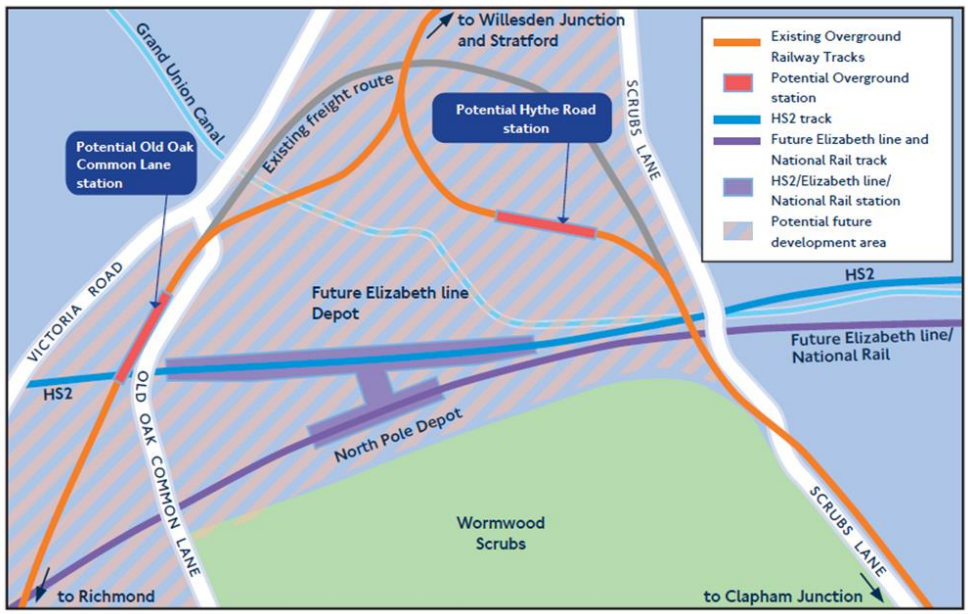
Activity	Date
Design	To 2020
Obtain TWAO	To 2022
Construction	To 2026
Opening	2026

TfL aims to open the two new Overground stations at the same time as the HS2 and Elizabeth line station at Old Oak Common opens, which is planned for 2026

1.5. A new Old Oak Common Lane station, on the North London Line (NLL), would be served by London Overground trains on the Stratford to Richmond route while a new Hythe Road station, on the West London Line (WLL), would be served by London Overground trains on the Stratford to Clapham Junction route.

1.6. Figure 3 shows the proposed locations of the two stations, and their proximity to the planned HS2/Elizabeth line/National rail station.

Figure 3: Proposed locations of the Old Oak Overground Stations



1.7. The scope, costs and schedule for the delivery of the OOOS will be refined as the project moves forward and an Outline Business Case (OBC) is developed.

The DfT's five-case model for transport appraisal underpins the methodology of this document

1.8. The purpose of a business case is to provide evidence-based information in relation to investment programmes. Guidance for the preparation of Business Cases for Transport Schemes has been published by the Department for Transport (DfT)[5]. This is based on HM Treasury's advice on evidence-based decision making as set out in the Green Book[6] and uses the best practice five-case model approach.

1.9. This approach assesses whether schemes:

i. are supported by a robust case for change that fits with wider public policy objectives – the 'strategic case';
ii. demonstrate value for money – the 'economic case';
iii. are financially affordable – the 'financial case';
iv. are commercially viable – the 'commercial case'; and
v. are achievable – the 'management case'.

1.10. The evidence gathered as part of the business case preparation process has been prepared using the tools and guidance provided by the DfT notably WebTAG[7].

The decision making process is in three stages: Strategic Outline Business Case, Outline Business Case and Full Business Case

1.11. The decision making process, of which this Strategic Outline Business Case forms part, usually takes place in three phases. Each phase includes the preparation of a business case followed by an investment decision point.

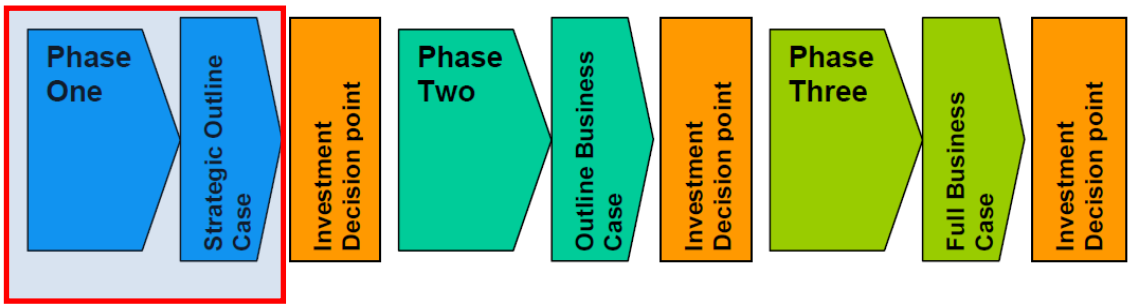
1.12. Each business case builds upon that previously prepared. Evidence is reviewed to ensure that it remains up to date, accurate and relevant. The Strategic Outline Business Case is Phase One of this iterative process, with two further future stages of development to follow, as shown in Figure 2.

[5] DfT (2009)

[6] DfT (2009) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/85930/dft-transport-business-case.pdf

[7] DfT (2009) https://www.gov.uk/transport-analysis-guidance-webtag https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf

Figure 4: Decision making process



1.13. Phase One focusses on articulating the need for the intervention and summarising the range of options developed and considered.

1.14. This phase:

i. is used to set out the strategic fit of the project with achieving relevant national, London Mayoral and TfL policy objectives;
ii. confirms the strategic fit and the case for change;
iii. scopes out the initial investment/intervention proposal; and
iv. provides details of the project's overall balance of benefits and costs against objectives.

1.15. In the next stage, Phase Two, which, subject to the conclusions of this Strategic Outline Business Case and the confirmation of funding for further scheme development will follow over the course of 2018, TfL would reconfirm the conclusions from Phase One and will concentrate on a more detailed assessment, culminating in the preparation of an Outline Business Case, which would build on the Strategic Outline Business Case.

1.16. The final phase in the process, Phase Three, would result in the production of the Full Business Case – this will accompany a Transport and Works Act Order (TWAO) application which is required to gain consent for the scheme. Subject to funding for the scheme being confirmed and assuming the scheme continues to fit with the policy and operational requirements of TfL and other key stakeholders, a TWAO application could be submitted by 2020.

The Strategic Case element of this document is set out in five parts which is explained in sections 2 – 6

1.17. The Strategic Case sets out the need for the intervention, its aims and objectives and how these fit with the wider policy context. It provides suggested or preferred ways forward and presents the evidence for decisions taken at this stage. Alternatives to the proposed solution are also considered.

1.18. The Strategic Case is the first of the five cases forming the Transport Business Case. Its purpose is to set out the need for investment in the transport system, describe the rationale for making the investment, and how the investment furthers the aims and objectives of the sponsoring organisation.

1.19. The Strategic Case sets out the need for the intervention, its aims and objectives and how these fit with the wider policy context. It provides suggested or preferred ways forward and presents the evidence for decisions taken at this stage. Alternatives to the proposed solution are also considered.

1.20. The strategic case element of this document is set out in five parts:

i. Strategic Case Part A: Evidencing the need for additional London Overground stations at Old Oak
ii. Strategic Case Part B: The Case for Change
iii. Strategic Case Part C: Determining the best option to meet the identified needs and so best deliver against the case for change
iv. Strategic Case Part D: Overview of the preferred option and sub-options
v. Strategic Case Part E: Strategic Policy Fit

Section 2: Strategic Case Part A - Evidencing the need for the new London Overground stations at Old Oak

Section summary:

- London continues to have substantial growth and regeneration challenges which the transport system needs to play its role in addressing
- There is a need to drive regeneration in the Old Oak and in west London more widely
- The Old Oak and Park Royal Opportunity Area is estimated to account for up to 20 per cent of London's growth over the next 20 years and could provide a £15 billion boost to London's economy. The current Opportunity Area Planning Framework (OAPF) suggests the area could accommodate 25,500 new homes and 65,000 jobs which would deliver a major contribution to London's housing and employment needs
- A new HS2/Elizabeth line/National rail station is to open in the Old Oak area in 2026 to provide interchange opportunities for HS2 passengers wishing to connect with trains on the Great Western Main Line and the Elizabeth line, both of which will be provided for at the new station
- Subject to remediation of a number of legacy issues, the Old Oak area has the potential to accommodate a large quantity of new housing and office development, and establish itself as an exemplar sustainable new neighbourhood and destination
- A Mayoral Development Corporation, the Old Oak and Park Royal Development Corporation (OPDC) was established in 2015 to lead on the regeneration and transformation of the area
- The HS2/Elizabeth line/National rail station will transform cross-London and longer distance connectivity but it has primarily been designed as an interchange to meet HS2 requirements rather than to address the full range of connectivity requirements associated with the sustainable development of the area surrounding the station
- Three separate but related studies commissioned by TfL demonstrate that the transport connectivity and capacity issues at Old Oak are likely to hinder the viability and quality of life to existing residents, workers and to the planned housing and office developments in the future
- The collective results of the Old Oak Common, Willesden Junction and North Action studies clearly demonstrate the need for additional rail stations within the heart of Old Oak

London continues to have substantial growth and regeneration challenges which the transport system needs to play its role in addressing

2.1. London is a global city and the UK's main engine of economic growth. London is currently at the top of a number of international city competitiveness rankings[8]. This has resulted in strong employment growth, and a rapidly growing population. Since the mid-1990s there has been sustained growth in the capital's population and economy. Between 2005 and 2017 London's population grew from 7.5 million to 8.8 million. The number of private sector jobs within London has risen by 650,000 over the period 2005 to 2015 and the number of businesses has risen by 115,000 over the same period.

2.2. London's population is set to grow to around 10.5 million by 2041, a higher rate of growth than all other UK regions and the total number of jobs is forecast to increase by more than 1.2 million over the same period. Productivity is increasing, with London's economy, measured in Gross Value Added (GVA), forecast to grow by over 2.5 per cent a year. The rate of employment growth is strongest in inner London, with the majority of the forecast new jobs being created within the Central Activities Zones (CAZ). This will result in more commuting into the CAZ from Zones 2-6 and beyond.

2.3. If London is to continue succeeding as a World City it needs to provide a range of employment locations that between them allow it to respond effectively to emerging requirements in various growth sectors of the economy.

2.4. While employment in the high value service activities associated with its World City role is highly likely to remain heavily concentrated in the Central Activities Zone (CAZ), a small number of 'satellite centres' are also likely to be required, particularly for accommodating fast growing emerging sectors with large floorplate requirements. On the back on significant investment in transport and other infrastructure, such 'satellite centres' have already been developed at locations such as Canary Wharf and Stratford in east London, but not yet in west London.

2.5. The city's success and growth also pose continuing challenges for London and the transport system upon which it relies. The most significant of these is that over the past quarter of a century or so, a chronic undersupply of housing has emerged.

[8] For example: PWC (2016) Cities of Opportunity ranking of 30 major cities http://www.pwc.co.uk/industries/government-public-sector/insights/cities-of-opportunity-7.html

2.6. A continued shortage of housing, where supply does not increase to meet growing demand would result in the affordability of housing continuing to worsen. If housing costs in London continue to rise, households would have less disposable income to spend on goods and services or would move out of the city and face long commutes from places outside London. Others might be discouraged from taking up new jobs in London. Building upon relatively high levels of investment in London's transport system in recent years, improving the connectivity of the system to unlock sustainable housing delivery in areas of strong development potential is a critically important means of addressing this.

2.7. The development of the Old Oak and Park Royal Opportunity Area could provide a £7 billion boost to London's economy. The Old Oak and Park Royal Opportunity Area Planning Framework suggests the area could accommodate 25,500 new homes and 65,000 jobs which would deliver a major contribution to London's housing and employment needs.

2.8. The Old Oak and Park Royal Opportunity Area comprises a brownfield site covering 650 hectares of land, including over 135 hectares of developable land and straddles the boundaries of the three London boroughs of Brent, Ealing, and Hammersmith & Fulham.

2.9. The HS2/Elizabeth line/ National rail station at Old Oak Common is to be delivered in 2026. Once open, it will provide direct services to Birmingham when Phase 1 opens in 2026; following the opening of Phase 2a in 2027 it will offer fast services to Crewe and the major cities of north west England and from 2033, when Phase 2b is due to open, it will offer direct high speed services to nine of the UK's ten largest urban areas, including the East Midlands, Sheffield and Leeds.

2.10. Much of the proposed growth in homes and jobs in the Old Oak area is predicated on this new station, which will provide a step change in connectivity nationally and regionally to and from the area. However, by itself this will not provide such a step change in connectivity to all the surrounding communities nor will it serve the whole of the area.

2.11. To capitalise on the delivery of the planned HS2/Elizabeth line/National rail station, a Mayoral Development Corporation, the Old Oak and Park Royal Development Corporation (OPDC) was established in 2015 to lead on the regeneration and transformation of the area.

2.12. To achieve the ambitious scale of development, high density new development and appropriate complementary transport provision in addition to the planned HS2/Elizabeth line/National rail station will be vital to allow residents, workers and visitors to travel to and from Old Oak in a sustainable manner.

2.13. In particular, planning for further transport provision will be needed in order to enhance the accessibility to public transport services from most areas within the Old Oak area.

2.14. A continued shortage of housing, where supply does not increase to meet growing demand would result in the affordability of housing continuing to worsen. If housing costs in London continue to rise, households would have less disposable income to spend on goods and services or would move out of the city and face long commutes from places outside London. Others might be discouraged from taking up new jobs in London.

2.15. This would result in higher recruitment costs to firms, firms that are trying to expand facing difficulties finding the staff they need.

2.16. According to research by London First[9], three-quarters of London businesses believe that the lack of new homes and rising housing costs are a significant risk to the capital's economic growth. The Confederation of British Industry (CBI) report 'Housing Britain'[10], summarised results from a CBI/KPMG London Business Survey.

2.17. In this survey, housing costs came out as the second biggest threat to competitiveness in the capital and a quarter of the firms surveyed listed it as a risk to London's ongoing competitiveness.

2.18. Research by Centre for Economics and Business Research (CEBR)[11] shows that there is a £5 billion wage premium – £1,720 per employee per year – faced by London businesses due to high housing costs

There is a need to drive regeneration in the Old Oak and in west London more widely

2.19. Old Oak and Park Royal is the largest regeneration project in the UK since the regeneration of east London as part of the London 2012 Games.

[9] London First (2015) Carrots and Sticks http://londonfirst.co.uk/wp-content/uploads/2015/05/Carrots-and-Sticks-Report_Web.pdf

[10] CBI (2014) Housing Britain – Building new homes for growth http://news.cbi.org.uk/news/homes-for-growth/

[11] CEBR (2015) London Housing: A Crisis for Businesses Too - http://londonfirst.co.uk/wp-content/uploads/2016/04/CEBR-report-Londons-housing-crisis.pdf

2.20. It is not just the size and potential of the opportunity area that makes it unique; it will also be the only place where HS2 will meet the Elizabeth line providing the area with unique opportunities to unlock further development and growth.

2.21. This presents a once in a lifetime opportunity for physical and economic regeneration, transforming one of London's most inaccessible areas into a well-connected, world-class transport interchange, with high quality new housing and commercial development, surrounded by sustainable and thriving neighbourhoods and valued amenity space.

2.22. Improving local connectivity to Old Oak from all directions is critical to help maximise the opportunities for regeneration of the area. As part of the station proposals, new high quality pedestrian and cycle links will be provided across the Old Oak development area connecting to Victoria Road and the HS2/Elizabeth line/National rail transport hub.

2.23. The HS2/Elizabeth line/National rail station at Old Oak Common will in itself be a major catalyst for the regeneration of the area; however, given the scale of the regeneration in OPDC area, the new London Overground stations will enhance the ability to achieve its full regeneration potential.

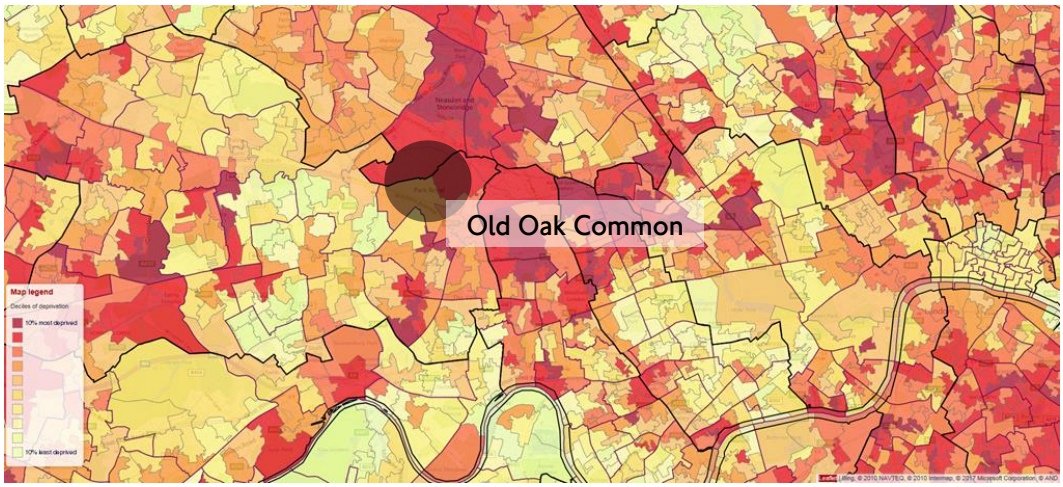
2.24. It is anticipated that this infrastructure investment will encourage further transformation and regeneration within the OPDC region.

2.25. The Old Oak area has a relatively high level of deprivation. Analysis of the 2015 Index of Multiple Deprivation[12] shows that on average, levels of deprivation in the Old Oak area are equivalent to the 30 per cent most deprived areas in the country. The deprivation in terms of income, crime, barriers to housing and services and living environment are major factors for deprivation in the area.

2.26. Figure 5 shows the Index of Multiple Deprivation map of the Old Oak area.

[12] DCLG (2015) Index of Multiple Deprivation

Figure 5: Index of Multiple Deprivation map around the Old Oak area



Source: DCLG IMD Explore

2.27. The Old Oak area exhibits the following socio demographic characteristics:

i. Projected and historical rates of population growth, not taking into account the Old Oak and Park Royal development, are higher than across the surrounding boroughs.

ii. The area's population is marginally younger than across the surrounding local authorities and London. A larger proportion of the population is of Black/African/Caribbean/Black British ethnicities.

iii. Available data indicate that rates of unemployment are higher within the station catchment area than in local, regional and national benchmarks.

iv. There is a greater concentration within the station catchment area of typically lower productivity sectors, such as 'Distribution, hotels and restaurants' and 'Transport and communication'.

v. There is some evidence that local residents are not accessing employment in more productive sectors or occupations, possibly due to lower levels of educational attainment compared to local and regional benchmarks (though they are strong compared to national levels). Accordingly, mean and median household incomes are lower in the station catchment area than across the surrounding local authorities and London.

vi. There is significant deprivation within the station catchment area, with 69 per cent of the population amongst the 30 per cent most deprived in England. Domains of deprivation with particular challenges in relation to incomes, crime, barriers to housing and services and the living environment. This provides evidence that there is a need for both physical and socio-economic regeneration.

vii. There are high levels of commuting in and out of the area, with only 19 per cent of residents working within the station catchment area. There is a net inflow of commuters to the station catchment area.
viii. Available data imply a high level of churn and low levels of business survival within the station catchment area, with very high levels of new businesses and a lack of long-established businesses.

2.28. One of the drivers of this is likely to be poor accessibility and connectivity to employment opportunities, given the poor transport connectivity of the area. Several academic studies, summarised in a 2014 University College London (UCL) paper[13] cite a clear link between transport connectivity to employment opportunities and deprivation.

2.29. If connectivity at Old Oak with the Overground network could be maximised, this will also be of benefit to HS2 and Elizabeth line passengers as journey times and the cost of travel to access these routes will be reduced from some parts of north, north west and south west London, by providing quicker, cheaper alternatives to travelling via central London. The lack of effective, convenient Overground connectivity at Old Oak will therefore be a constraint on accessibility of HS2 and Elizabeth line from these parts of London and therefore would act as a constraint on London's growth.

2.30. The OOOS scheme has the ability to facilitate the large scale regeneration planned at Old Oak. If the opportunity to connect Overground services to the area was to be missed the full scale of regeneration would not be fully realised.

The Old Oak and Park Royal Opportunity Area is estimated to account for up to 20 per cent of London's growth over the next 20 years and could provide a £15 billion boost to London's economy. The current Opportunity Area Planning Framework (OAPF) suggests the area could accommodate 25,500 new homes and 65,000 jobs which would deliver a major contribution to London's housing and employment needs

2.31. The Old Oak and Park Royal Opportunity Area comprises a brownfield site covering 650 hectares of land, including over 135 hectares of developable land and straddles the boundaries of the three London Boroughs of Brent, Ealing, and Hammersmith & Fulham.

[13] UCL (2014) Transport and Poverty, A review of the evidence

2.32. The HS2/Elizabeth line/National rail station will provide direct services to Birmingham when Phase 1 opens in 2026. After the opening of Phase 2a in 2027, it will offer fast services to Crewe and the major cities of north west England.

2.33. Finally, from 2033, when Phase 2b is due to open, there will be direct high speed services to nine of the UK's ten largest urban areas, including the East Midlands, Sheffield, and Leeds.

2.34. The planned HS2/Elizabeth line/National rail station in Old Oak, upon which much of the proposed growth in homes and jobs in the area is predicated will open in 2026 and will provide a step change in connectivity nationally and regionally to and from the area. However it will not provide this step change to the immediately surrounding communities nor will it serve the whole of the area.

2.35. To capitalise on the delivery of the planned HS2/Elizabeth line/National rail station, a Mayoral Development Corporation, the Old Oak and Park Royal Development Corporation (OPDC) was established in 2015 to lead on the regeneration and transformation of the area.

2.36. Subject to remediation of a number of legacy issues, the Old Oak area has the potential to accommodate a large quantity of new housing and office development, and establish itself as an exemplar sustainable new neighbourhood and destination.

2.37. The land surrounding Old Oak is in need of regeneration but by transforming its connectivity, the station will facilitate its development as a new high value commercial and residential location for London. The key indicative development sites are shown on Figure 6.

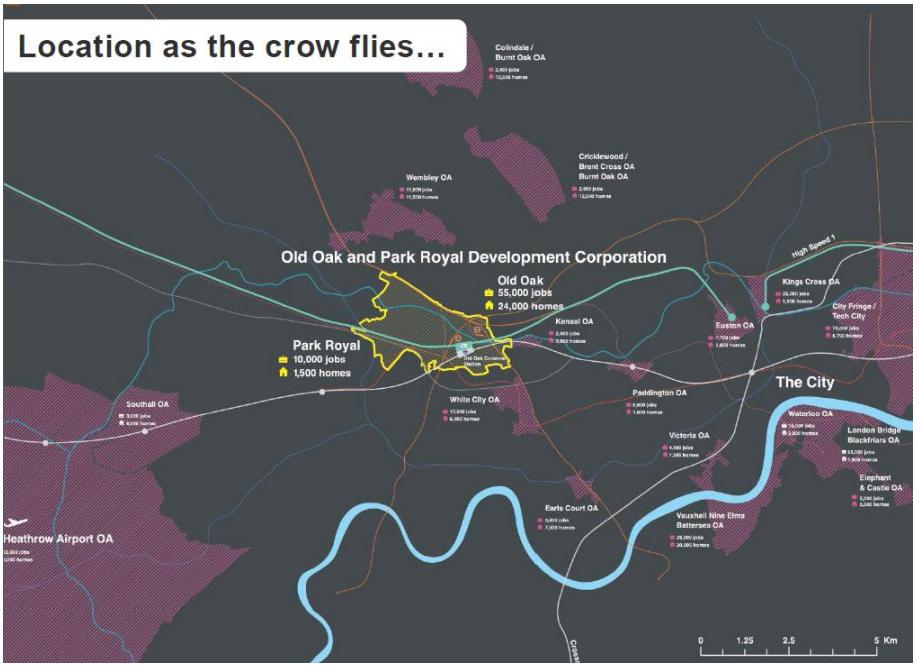
Figure 6: Indicative Development Sites at Old Oak Common area

Source: OPDC

2.38. To achieve the ambitious scale of development as illustrated on Figure 7 below, high density new development and appropriate transport provision in addition to the planned HS2/Elizabeth line/National rail station will be vital to allow residents, workers and visitors to travel to and from Old Oak in a sustainable manner.

2.39. This echoes the emphasis set out in the Mayor's Draft Transport Strategy on the fundamental role of transport in supporting the good growth of London's economy. The draft local plan was consulted in October 2017, and is expected to be adopted by early 2018.

Figure 7: Locations and development capacities of the Opportunity Areas at Old Oak and Park Royal identified by the OPDC



Source: OPDC

2.40. In particular, planning for further transport provision will be needed since accessibility to public transport services from most areas within the Old Oak area is relatively poor.

The HS2/Elizabeth line/National rail station will transform cross-London and longer distance connectivity but it has primarily been designed as an interchange to meet HS2 requirements rather than to address the full range of connectivity requirements associated with the sustainable development of the area surrounding the station

2.41. The HS2 station will provide direct services to Birmingham when Phase 1 opens in 2026; following the opening of Phase 2a in 2027 it will offer fast services to Crewe and the major cities of north west England and from 2033, when Phase 2b is due to open, it will offer direct high speed services to nine of the UK's ten largest urban areas, including the East Midlands, Sheffield and Leeds. Rail services on the Great Western Main Line (GWML) will also provide direct regional and long distance trains to a range of locations west of London such as Reading, Bristol, South Wales and the Southwest of England

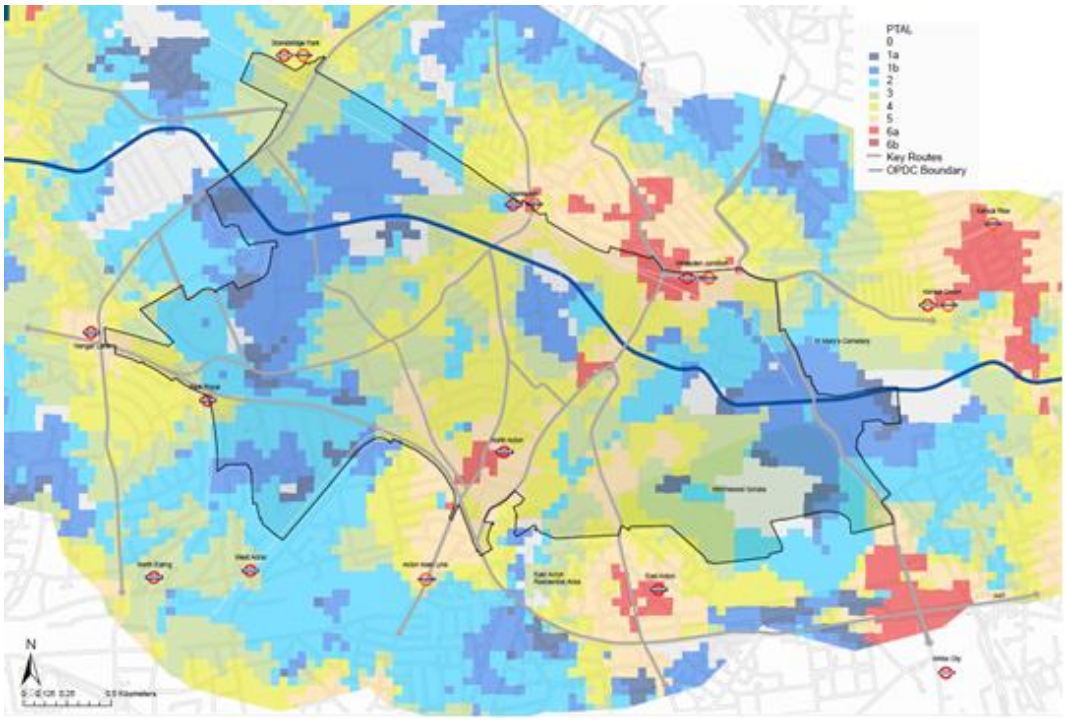
2.42. Rail services on the Great Western Main Line will also provide direct regional and long distance trains to a range of locations west of London such as Reading, Bristol, South Wales and the Southwest of England.

2.43. The west-east Elizabeth line route will provide direct connectivity between the Old Oak area and the West End, the City, Canary Wharf and Heathrow Airport. The vast majority of central London will be accessible directly or via a single interchange between Elizabeth line and the London Underground network.

2.44. Two orbital railway lines pass through Old Oak, carrying existing London Overground passenger services: the North London Line (NLL) carries services between Stratford and Richmond and the West London Line (WLL) joins this to provide services between Stratford and Clapham Junction. The nearest existing station to the planned HS2/Elizabeth line/National rail station that is served by LO services would be Willesden Junction (both WLL and NLL), which is located 1.5km away with no convenient links between the two.

2.45. For example, pedestrian links between Willesden Junction and Old Oak are poor and even if improved Willesden Junction is too remote from large areas of the Old Oak area to be a viable station for many users. Furthermore, Willesden Junction is some 1.5km away from the planned new HS2/Elizabeth line/National rail station, so does not offer a convenient means for passengers to interchange with London Overground services. Planning for further transport provision will in fact be needed since accessibility to public transport services from most areas within the Old Oak area is relatively poor, as shown in Figure 8.

Figure 8: Current Public Transport Accessibility Levels (PTAL) in the Old Oak Area



Source: OPDC Local Plan Revised Draft for Regulation 19 Consultation, 2017

2.46. In addition, there are very few pedestrian or cycle crossings to traverse these barriers and those that exist are of poor quality. The overall lack of accessibility is reflected in low PTAL scores of 1 and 2 for a large part of the Old Oak area. Rail stations, such as Willesden Junction and North Acton, and bus stops are located on the periphery of the site and pedestrian access to them from within the Old Oak area is extremely constrained by severance caused by rail lines, the Grand Union canal and the large industrial and commercial premises in the area.

2.47. The pedestrian and cycle access to the development sites and to the HS2/Elizabeth line/National rail station is also very poor based on the current plans. Other than the route along the towpath of the Grand Union Canal, the coherence and legibility of routes are poor, and does not constitute a network.

2.48. It is this gap in provision for the local communities north and south of Old Oak that this scheme aims to close, to enable new residents of Old Oak to access services at key centres such as Shephard's Bush, Richmond and Clapham Junction and other parts of London and surrounding communities to access the employment opportunities at Old Oak.

Three separate but related studies commissioned by TfL demonstrate that the transport connectivity and capacity issues at Old Oak are likely to hinder the viability and quality of life to existing residents, workers and to the planned housing and office developments in the future

2.49. Parallel to the development of the OPDC Masterplan, TfL has undertaken studies assessing the current and future pressures on the local transport networks in the vicinity of Old Oak, namely at Old Oak Common, Willesden Junction and North Acton. Collectively these studies demonstrate that the potential for success of the OPDC Masterplan will be inhibited by transport networks facing increasing pressure.

Strategic issues at Old Oak Common

2.50. As part of the Old Oak Common Strategic Transport Study[14], which looked at the transport needs of the future, a medium development scenario for the year 2031 of 24,000 homes and 55,000 jobs was modelled in accordance with the draft Further Alterations to the London Plan published in March 2016. This was compared with the reference case.

2.51. The study advised that spare capacity on the public transport network in conjunction with increased delays on an already congested highway network indicates that the solution lies in greater use of public transport, and in mode shift to cycling and walking - minimising additional car trips. In addition, improved access to the development sites and improved connectivity with the wider area, particularly for walking, cycling and public transport trips are needed to address problems of localised congestion.

2.52. Together with the general and significant background growth and the increase in travel demand resulting from the new HS2/Elizabeth line /National rail station, the additional homes and jobs at Old Oak will add to the existing pressure, both at the strategic and local level.

2.53. The study recommended that to accommodate the scale of development proposed at Old Oak, in addition to new Overground stations, major improvements will also be required at an early stage to existing rail stations including North Acton and Willesden Junction.

[14] Transport for London (2015) Old Oak Common Strategic Transport Study
https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/OOC%20Transport%20Study.pdf

Capacity at Willesden Junction station

2.54. In March 2017, dynamic modelling was carried out for Willesden Junction station, which lies north of Old Oak, reflecting the planned development demand. The key issues include:

i. the station is currently congested at peak times, with high platform occupancy,
ii. long dwell and clearance times (on stairs especially)
iii. narrow passageways, and
iv. confusing wayfinding and high interchange times.

2.55. As the demand increases over time towards 2026, the congestion conditions will worsen and the station control measures will be likely taken place in a regular basis at peak times.

2.56. The study[15] concluded that 'doing nothing is not a reasonable option, as the existing station cannot function with the expected future demand as indicated by the microsimulations'.

Capacity at North Acton station

2.57. North Action station already suffers from congestion during both the morning and evening peaks. With the intensive demand expected over the coming years, this will significantly exceed the capacity of the existing infrastructure.

2.58. The study[16] recommended that to accommodate the future demand increase, works at North Acton is likely to require improved entrances and ticket hall, a new footbridge, new stairs and lift access, in addition to the improved access arrangements.

Additional development at Old Oak will also impact other stations in the vicinity of Old Oak

2.59. Once delivery of development at Old Oak is well advanced, Kensal Green station, to the north east of Old Oak, is expected to experience similar issues of congestion as forecast at Willesden Junction, albeit without the interchanging passengers from orbital services. The demand at Kensal Green station is forecast to increase at a similar speed as at Willesden Junction Station in 2041.

[15] Transport for London / OPDC (2017) Willesden Junction Station and Interchange Feasibility Study (GRIP 2)
[16] Transport for London / OPDC (2015) North Acton Interchange Final Report

2.60. To date, no station congestion modelling has been undertaken for Kensal Green, which is served by Bakerloo Line and radial Euston-Watford Junction Overground services. Additionally, the impact of development and growth across the area will also put added pressure on the other nearby stations such as Harlesden, Park Royal, Stonebridge Park and Hanger Lane.

The HS2/Elizabeth line/National rail station will provide a step change in connectivity nationally and regionally to and from Old Oak, but will not provide this step change to all the surrounding communities

2.61. The HS2/Elizabeth line/National rail station will provide direct services to Birmingham from 2026; north west England from 2033 and to nine of the UK's ten largest urban areas by 2033. Rail services on the Great Western Main Line (GWML) will also provide direct regional and long distance trains to a range of locations west of London such as Reading, Bristol, South Wales and the South west of England.

2.62. The west-east Elizabeth line (previously known as Crossrail) will provide direct connectivity between the Old Oak area and the West End, the City, Canary Wharf and Heathrow Airport. The vast majority of central London will be accessible directly or via a single interchange between the Elizabeth line and the London Underground network.

2.63. The HS2/Elizabeth line/National rail station will transform cross-London and longer distance connectivity but it has primarily been designed as an interchange to meet HS2 requirements rather than to address the full range of connectivity requirements associated with the sustainable development of the area surrounding the station.

2.64. In particular, two orbital railway lines pass through the area, carrying existing London Overground (LO) passenger services: the North London Line (NLL) carries services between Stratford and Richmond and the West London Line (WLL) joins this to provide services between Stratford and Clapham Junction. The nearest existing station to the planned HS2/Elizabeth line/National rail station that is served by LO services would be Willesden Junction (both WLL and NLL), which is located 1.5km away with no convenient rail links or means for passengers to interchange between the two.

A new HS2/Elizabeth line/National rail station is to open in the Old Oak area in 2026 to provide interchange opportunities for HS2 passengers wishing to connect with trains on the Great Western Main Line and the Elizabeth line, both of which will be provided for at the new station

2.65. It is these gaps in provision that this scheme aims to close, to enable new residents of Old Oak to better access services at key centres such as Shephard's Bush, Richmond and Clapham Junction and other parts of London and surrounding communities to better access the employment opportunities at Old Oak.

Section 3: Strategic Case Part B – The Case for Change

Section summary:

Part 1: The role of the OOOS in addressing London's economic growth and regeneration challenges

Part 2: The role of OOOS as a driver of improved connectivity within west London, across all of Greater London and on to HS2

OOOS will improve transport connectivity across west London and beyond

The case for change is clear: OOOS would deliver regeneration, economic, housing and transport benefits to London, bringing better connectivity and better prospects not just to west London but London as a whole

3.1. Overall, the case for change at Old Oak, is set out in two parts:

i. Part 1 – the role of the OOOS in addressing London's economic growth and regeneration challenges;
ii. Part 2 – the role of the OOOS as a driver of improved connectivity within west London, across all of Greater London and on to HS2.

Part 1: The role of the OOOS in addressing London's economic growth and regeneration challenges

3.2. London is a global city and the UK's main engine of economic growth. London is currently at the top of a number of international city competitiveness rankings[17]. This is resulting in strong employment growth, and a rapidly growing population. Since the mid-1990s there has been sustained growth in the capital's population and economy. Between 2005 and 2017 London's population grew from 7.5 million to 8.8 million. The number of private sector jobs within London has risen by 650,000 over the period 2005 to 2015 and the number of businesses has risen by 115,000 over the same period.

3.3. London's population is set to grow to around 10.5 million by 2041, a higher rate of growth than all other UK regions and the total number of jobs is forecast to increase by more than 1.2 million over the same period. Productivity is increasing, with London's economy, measured in Gross Value Added (GVA), forecast to grow by over 2.5 per cent a year.

[17] For example: PWC (2016) Cities of Opportunity ranking of 30 major cities http://www.pwc.co.uk/industries/government-public-sector/insights/cities-of-opportunity-7.html

3.4. The rate of employment growth is strongest in inner London, with the majority of the forecast new jobs being created within the Central Activities Zones (CAZ). This will result in more commuting into the CAZ from Zones 2-6 and beyond. In the decade from 2005 to 2015, when London's population grew by more than a million, its housing stock grew by less than 300,000. The average home now costs more than 12 times the average earnings per full time worker across London as a whole.

3.5. In London Borough of Hammersmith & Fulham, one of the most unaffordable boroughs in London, the average house costs more than 21 times average earnings per full time worker[18] only behind London Borough of Kensington and Chelsea and Westminster. Homes in Brent and Ealing are both around 15 times the average earnings in the respective borough. This shortage of supply has resulted in a number of issues that are associated with deteriorating housing affordability.

3.6. If London is to continue succeeding as a World City it needs to provide a range of employment locations that between them allow it to respond effectively to emerging requirements in various growth sectors of the economy. While employment in the high value service activities associated with its World City role is highly likely to remain heavily concentrated in the Central Activities Zone (CAZ), a small number of 'satellite centres' are also likely to be required, particularly for accommodating fast growing emerging sectors with large floorplate requirements.

3.7. To the east, Canary Wharf and Stratford have emerged as commercial locations that can play such a role. These locations offered large areas of brownfield land (redundant docks, railway land etc) and were in relatively close proximity to central London. A vital precondition for their success however has been investment in high quality connections to the transport system serving central London which has allowed them to share largely the same employment catchment area as the CAZ.

3.8. Extending CAZ-like employment opportunities to Canary Wharf since the 1990s, and more recently to Stratford off the back of the London 2012 Games and investment in strong transport connectivity has shown that in certain circumstances, complementing the CAZ with satellite centres with access to space and human capital can and is helping London to continue its growth as a World City.

3.9. The area covered by the OPDC possesses a number of attributes which would enable it to function as a CAZ satellite centre in a similar way to Canary Wharf and Stratford subject to the provision of similar levels of investment and transport connectivity:

[18] DCLG (2016) data on average house prices to median earnings ratio - http://data.london.gov.uk/dataset/ratio-house-prices-earnings-borough

i. There is a sufficiently large area of brownfield land available for the development of a significant cluster of commercial development;
ii. The site is in close physical proximity to central London; and
iii. There is planned provision for long distance and radial cross-London transport at the HS2/Elizabeth line/National rail station, which will be served by the Elizabeth line services and Great Western as well as HS2 trains. This will provide improved connectivity with other employment centres including the CAZ, Canary Wharf, Stratford, and all the main regional cities, as well as a very fast link to Heathrow Airport.

3.10. However, local connectivity challenges remain to the immediately surrounding areas, particularly from the planned HS2/Elizabeth line/National rail station to north, south and south west London. The radial network enabled by the OOOS would help to address the local connectivity challenges at Old Oak and therefore help Old Oak to achieving the CAZ satellite status.

3.11. Old Oak has strong potential to be a sustainable residential development in the heart of west London but needs better connectivity and accessibility to attain its full potential. The area has the capacity to deliver significant housing growth but poor levels of public transport accessibility and connectivity across the area will need to be addressed if this potential is to be fully realised and if the growth is to be aligned with 'good growth' principles.

3.12. If connectivity at Old Oak with the Overground network could be maximised, this will also be of benefit to HS2/Elizabeth line/National rail passengers as journey times and the cost of travel to access these routes will be reduced from some parts of north, north west and south west London, by providing quicker, cheaper alternatives to travelling via central London.

3.13. Old Oak and Park Royal is the largest regeneration project in the UK since the regeneration of East London as part of the London 2012 Games. It is not just the size and potential of the opportunity area that makes it unique; it will also be the only place where HS2 will meet the Elizabeth line providing the area with unique opportunities to unlock further development and growth.

3.14. This presents a once in a lifetime opportunity for physical and economic regeneration, transforming one of London's most inaccessible areas into a well-connected, world-class transport interchange, with high quality new housing and commercial development, surrounded by sustainable and thriving neighbourhoods and valued amenity space.

3.15. Improving local connectivity to Old Oak from all directions is critical to help maximise the opportunities for regeneration of the area. As part of the station proposals, new high quality pedestrian and cycle links will be provided across the Old Oak development area connecting to Victoria Road and the main HS2/Elizabeth line/National rail transport hub.

3.16. The HS2/Elizabeth line/National rail station at Old Oak Common will in itself be a major catalyst for the regeneration of the area; however, given the scale of the OPDC area, the OOOS will enhance the ability to achieve its full regeneration potential.

3.17. The OOOS have the ability to help facilitate the large scale regeneration planned at Old Oak. If the opportunity to connect Overground services to the area was to be missed the full scale of regeneration would not be fully realised. It is anticipated that this infrastructure investment will encourage further transformation and regeneration within the OPDC region.

3.18. The viability of many of the development sites would be enhanced by the OOOS and the supporting transport measures (e.g. enhanced bus service levels) and the community facilities delivered by the OPDC Masterplan.

3.19. The OOOS would support the delivery of new employment-generating floor space. The Development Capacity Study prepared by the OPDC proposes the provision of 56,700 square metres of retail/leisure floor space and 683,600 square metres of B1 (business use) floor space overall, which will enable the 65,000 jobs in the area.

3.20. The OOOS would generate an additional 1,500 Full Time Equivalent (FTE) jobs including direct, indirect and induced employment[19] from local to the national level. Of the 1,500 FTE employment, 830 are expected to be new direct jobs, either at the stations during construction or in the operation of the train service if both Hythe Road and Old Oak Common Lane stations were constructed. The remainder would be indirect and induced jobs including employment within the new non-residential floor space.

3.21. The OOOS would also generate additional residential units, which would translate into around 200 homes in the area. Further to the stations themselves, the viaduct at Hythe Road would also unlock developable land and enable a further number of homes to be developed.

[19] Homes and Communities Agency (2014) HCA Additionality Guide, Fourth Edition
This estimate of operational employment was calculated using employment densities drawn from the HHC Employment Densities Guide. Assumptions relating to leakage, displacement and multipliers have been drawn from this document.
:https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/378177/additionality_guide_2014_full.pdf

3.22. The additional residents living in the development area near Hythe Road enabled by the new station would then create demand for goods and services, which in turn will create jobs in the locality.

3.23. An analysis of the potential land value uplift associated with the OOOS has identified a positive relationship between new stations and the land values. The analysis has identified that the two new Overground stations could potentially generate an increase in land values of between £168 million and £285 million.

3.24. Access to labour markets, access to customers and affordability all influence where businesses choose to locate. By supporting the delivery of new housing and commercial development, OOOS would assist with the creation of a new community, which will bolster and diversify the local labour market. Combined with better connectivity, the OOOS would therefore enhance the area's attractiveness to investment, supporting economic growth and regeneration within and beyond Old Oak.

Part 2: The role of OOOS as a driver of improved connectivity within west London, across all of Greater London and on to HS2

3.25. In order to fully realise the potential growth and regeneration of Old Oak, it is important to address shortcomings in orbital transport connectivity to maximise the areas full potential.

3.26. Old Oak is planned to accommodate 25,500 new homes, making a vital contribution to London's supply of new housing and therefore helping ensure the city can continue to grow. Housing supply is widely recognised as being a hindrance on London's growth.

3.27. The quality of public transport available to the future residents is also important in a number of respects.

3.28. Old Oak is situated close to several well established areas of west London including White City / Shepherd's Bush, Kensington / Earls Court, and Ealing. High quality access to the facilities these locations offer could help make it into an attractive residential location eg Westfield at Shepherd's Bush, retail and cultural facilities in Kensington etc. While the rail services available at the planned HS2/Elizabeth line/National rail station will provide excellent connections to major employment locations, including the CAZ, Canary Wharf, Stratford and Heathrow, they do not provide comprehensive public transport connections to these areas, with the exception of Ealing.

3.29. It is also unlikely that high quality road access could be provided to these locations as the surrounding highway network is severely constrained and suffers from chronic congestion. In any case such an approach would not be consistent with the principles of 'good growth' that forms a cornerstone of the draft MTS. This requires new housing to be provided in dense developments that have high quality provision for both active and public transport modes that mean people can access the full range of travel needs without the need to own a car.

3.30. Accessing healthcare, education, social connections, leisure opportunities as well as work related travel without a car is key to building a successful and sustainable community. It is clear however that without '360 degree public transport' provision it will be very difficult to encourage development that supports sustainable lifestyles in this way at Old Oak. Since one of the principles of good growth, a key tenet of the Mayor's draft Transport Strategy, is to encourage higher densities of development around public transport hubs, OOOS should allow the volume of sustainable housing the overall Old Oak area can accommodate to increase.

3.31. Linking the HS2/Elizabeth line/National rail station at Old Oak Common with the Overground network through two new stations at Hythe Road and Old Oak Common Lane has many benefits, both to the HS2 and Elizabeth line projects and to west London more broadly, by the creation of enhanced opportunities for strategic rail interchange between radial and orbital networks:

i. improved public transport links with those neighbouring areas that are not well served by the planned HS2/Elizabeth line/National rail station's radial east – west links, to enable access to the local employment markets, upon which any such major employment centre will rely;
ii. Improved links to other parts of London that are not well served by the HS2/Elizabeth line/National rail station's radial east – west links. These include areas in north, west, and south west London; and
iii. improved links to the city's wider employment catchment area in south east England that are not well served by the HS2/Elizabeth line/National rail station's radial east – west links and in particular the south west rail corridor served by services to London Waterloo, which is the largest and most affluent commuter corridor, accounting for 20 per cent of total central London commuters.

3.32. The OOOS would provide improved accessibility to Old Oak, particularly from south and south west London. Key beneficiaries of the scheme would be residents and firms based in London Borough (LB) of Richmond, with large swathes of the borough benefiting from journey time savings in excess of 20 minutes. Other beneficiaries of the project include residents and firms based in the boroughs of Kingston, Sutton, Croydon, Merton, Wandsworth, Hounslow, Harrow, Barnet, Brent and Camden.

3.33. In addition, the OOOS would allow HS2 and Elizabeth line passengers access to a wide range of fully accessible routes, with many stations on the London Overground network being step-free. Moreover, a London Overground connection at Old Oak could result in five airports (two more than without the OOOS) being within 45 minutes of Old Oak: Heathrow, Gatwick, Luton, London City and Birmingham.

3.34. In east London there will be excellent interchange opportunities with the Elizabeth line at locations such as Stratford, Canary Wharf and Whitechapel and including many of the newer orbital links provided by the DLR and London Overground that have benefitted from significant investment in the last 25 years. In contrast, there are far fewer opportunities for interchange on the Elizabeth line in west London – the only orbital 'feeder' route into the Elizabeth line is the short national rail link between Greenford and West Ealing.

3.35. Local connections at Old Oak would reduce a certain degree of pressure on Euston. The effects of providing the OOOS will result in a marginal reduction in passengers at Euston in 2041. However, this overall reduction in passenger numbers represents a benefit in terms of reduced pressure on the crowded Underground and bus networks serving the station.

3.36. Large scale residential development at Old Oak also represents a regeneration opportunity for surrounding deprived communities in west London provided Old Oak is properly integrated with such areas. On this basis Old Oak residents could help revitalise such areas through becoming involved in community activities and also by increasing demand for goods and services in the surrounding local town centres including Ealing and Shepherds Bush, but this requires high quality access.

OOOS will improve transport connectivity across west London and beyond

3.37. In order to fully realise the potential growth and regeneration of Old Oak, shortcomings in Old Oak's orbital transport connectivity need to be addressed.

3.38. Therefore linking the HS2/Elizabeth line /National rail station with the Overground network through two new stations at Hythe Road and Old Oak Common Lane has many benefits, both to the HS2 and Elizabeth line projects and to west London more broadly, by the creation of enhanced opportunities for strategic rail interchange between radial and orbital networks.

The OOOS would substantially shorten journey times to neighbouring areas, and more widely within west London and beyond

3.39. Table 7 presents some example journey times with and without the scheme to demonstrate the improved connectivity.

Table 7: Journey times with and without new Overground stations at Old Oak

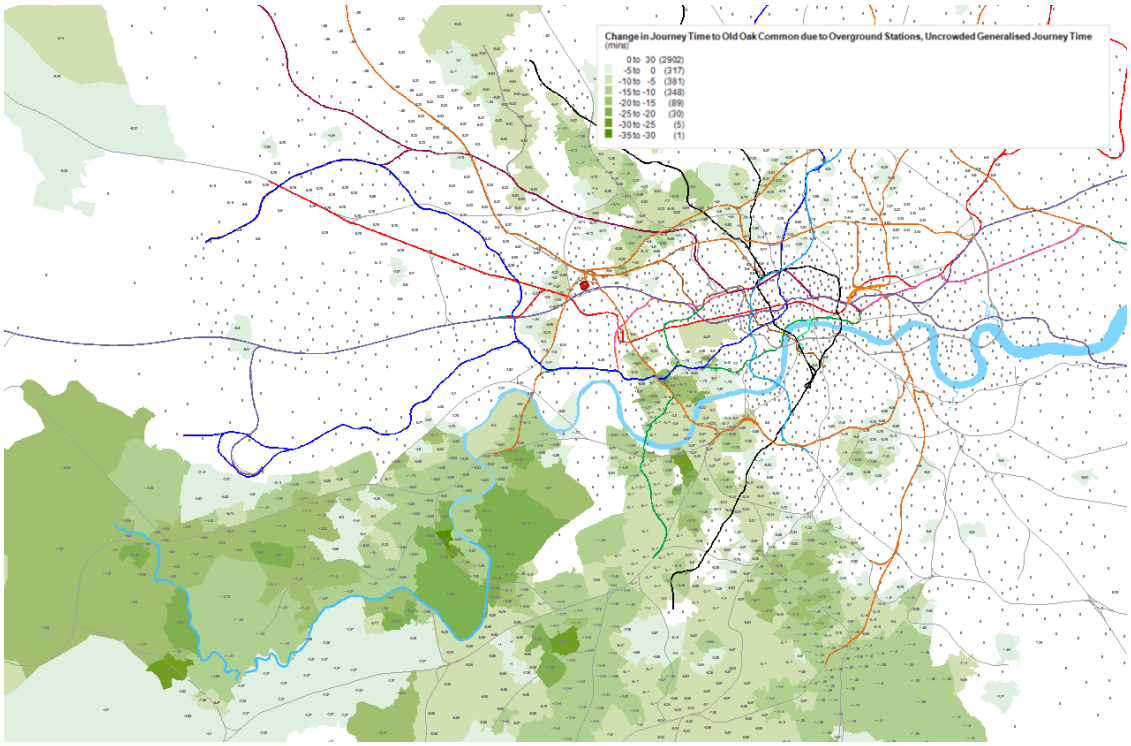
Route	Without scheme	With scheme
Richmond to Paddington	30-35 mins 1 change	20-25 mins 1 change
Clapham Junction to Heathrow	50-60 mins 2 changes	30-35 mins 1 change
Acton Central to Bond Street	35-40 mins 2 changes	20-25 mins 1 change
Willesden Junction to Liverpool Street	35-40 mins 1 change	25-30 mins 1 change

3.40. Journey time benefits and crowding effects are considered as part of the generalised journey time in the Railplan model (described in more detail as part of the economic case in section 7 of this document). Outputs from Railplan can be used to demonstrate the effect of the scheme on journey times.

3.41. The new stations provide improved accessibility to Old Oak, particularly from south and south west London. The key beneficiary of the scheme would be residents and firms based in LB Richmond, with large swathes of the borough benefiting from journey time savings in excess of 20 minutes. Other beneficiaries of the project include residents and firms based in the boroughs of Kingston, Sutton, Croydon, Merton, Wandsworth, Hounslow, Harrow, Barnet, Brent and Camden.

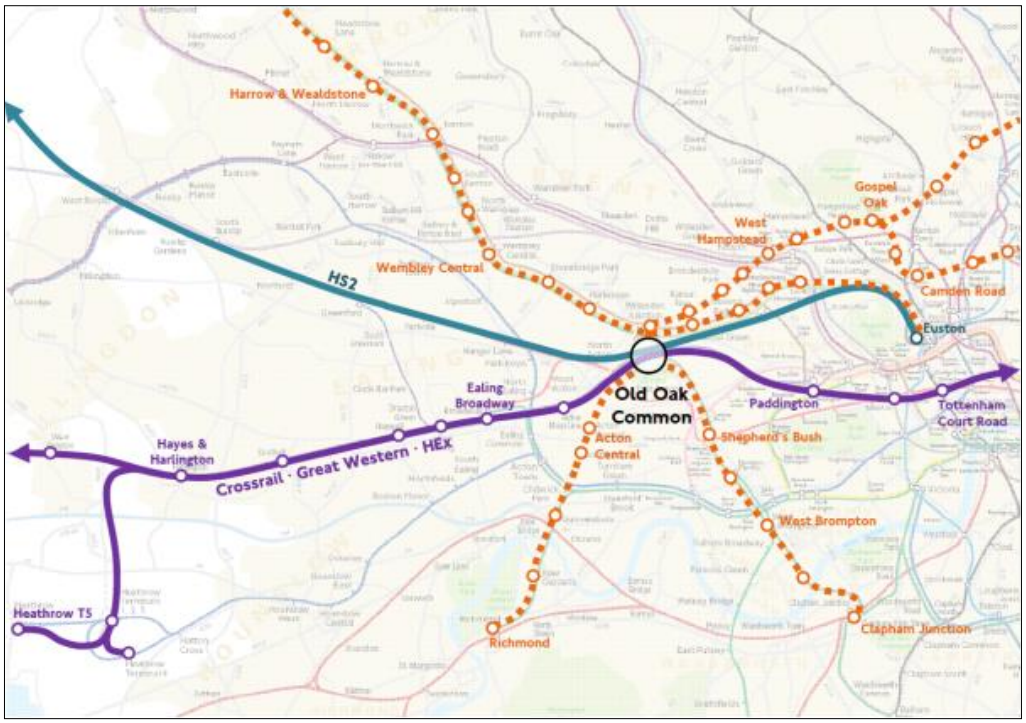
3.42. Figure 9 presents the differences in journey times to the Old Oak area compared to the Do Minimum scenario. The Do Minimum scenario represents the future transport network assuming committed schemes have been delivered (for further details see section 7). The largest journey time savings can be found in north, south west and south London. The maximum journey time saving is up to 30 minutes.

Figure 9: Change in journey time to Old Oak due to Overground stations



3.43. In addition, OOOS would allow HS2 passengers access to a wide range of fully accessible routes, with many stations on the London Overground network being step-free. Moreover, a London Overground connection at Old Oak could result in five airports being within 45 minutes of Old Oak: Heathrow, Gatwick, Luton, London City and Birmingham. The current and proposed rail connections are illustrated in Figure 10.

Figure 10: Improved and wider connectivity with the Overground stations



Source: TfL

Opportunities for interchange for movements within west London and to central London, Canary Wharf, Stratford and Heathrow will substantially improve with the construction of the London Overground stations

3.44. The Elizabeth line will provide huge improvements in London wide east – west connectivity offering much improved links to (and between) all the city's existing 'global employment centres' i.e. the West End, the City of London, northern Isle of Dogs, Stratford, as well as Heathrow Airport.

3.45. Large parts of London will benefit from the Elizabeth line through interchange opportunities with other routes.

3.46. Since central London is the focus of the radial transport network there are many interchange opportunities for users of the high capacity national rail and London Underground routes that converge there. For example, the five central London Elizabeth line stations offer interchange with 7 of the 11 London Underground lines as well as Thameslink north-south cross-London National route at Farringdon and the National rail routes served by Paddington and Liverpool Street.

3.47. In east London there will be excellent interchange opportunities with the Elizabeth line at locations such as Stratford, Canary Wharf and Whitechapel and including many of the newer orbital links provided by the DLR and London Overground that have benefitted from significant investment in the last 25 years. In contrast, there are far few opportunities for interchange on the Elizabeth line in west London – the only orbital 'feeder' route is the short national rail link to Greenford.

New London Overground stations at Old Oak will relieve pressure in central London

3.48. In the case of HS2, without providing suitable and convenient connections to the Overground network at Old Oak, more passengers from these parts of London will need to use Euston in order to access the high speed line.

3.49. HS2 will result in a significant increase in passenger demand on routes to and from Euston and at the station itself when it opens in 2026, with many routes for onward dispersal or arrival such as the Victoria and Northern lines already forecast to be very congested and at maximum capacity at peak times.

3.50. HS2 is set to bring 10,500 passengers to Euston in the AM peak (07:00-10:00) during Phase 1 (2026), but this increases to 24,500 in Phase 2 (2033). Whilst some of these passengers will be switching from existing West Coast Main Line services, crowding levels at underground stations at Euston are likely to be prohibitively high.

3.51. Local connections at Old Oak would reduce a certain degree of pressure on Euston. The effects of providing the new Overground stations at Old Oak will result in a relatively marginal reduction in passengers at Euston in 2041. However, this overall reduction in passenger numbers represents a benefit in terms of reduced pressure on the crowded Underground and bus networks serving the station.

3.52. It is worth noting that reductions in demand at Euston as a result of the new Overground stations are marginal when considered at the scale of overall morning peak demand at Euston, and would not avoid the need for more significant investment in capacity in the form of Crossrail 2, but the scheme does provide a beneficial impact.

3.53. There is a marginal reduction in crowding on the Victoria line in both directions between Euston and Victoria. There is also a further marginal reduction in crowding on the Charing Cross branch of the Northern line northbound between Tottenham Court Road and Euston. The changes are not of an order of magnitude that can easily be represented using Underground network standard crowding diagrams so have not been presented here.

3.54. The new Overground stations would also accommodate trips related to the development at Old Oak and providing additional capacity to the existing stations at Old Oak. The new Overground stations will reduce the annual station demand at Willesden Junction by 13 per cent (2 million) in 2041 and by 6 per cent (0.4 million) at North Acton.

3.55. As well as providing congestion relief at London Euston, the new London Overground stations will provide excellent local and sub-regional connections to Old Oak and will support development by extending the catchment area for new commercial activities bringing 250,000 additional people and 150,000 additional jobs within an hour's journey of Old Oak (as illustrated in Figure 11 and Figure 12).

3.56. The new stations will be essential to deliver the scale of development envisaged without compromising the operation of other parts of the transport network. They will provide a level of public transport access and capacity which can support high density residential and commercial development.

Figure 11: Catchment area to Old Oak in 2016

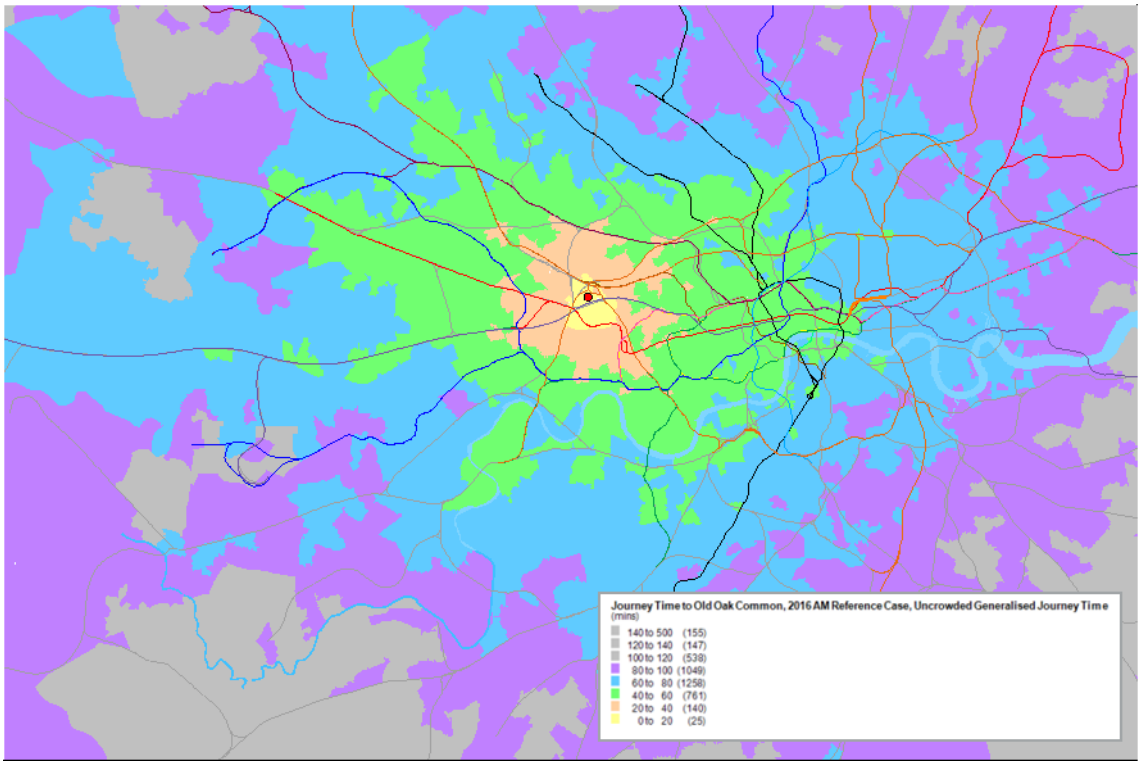
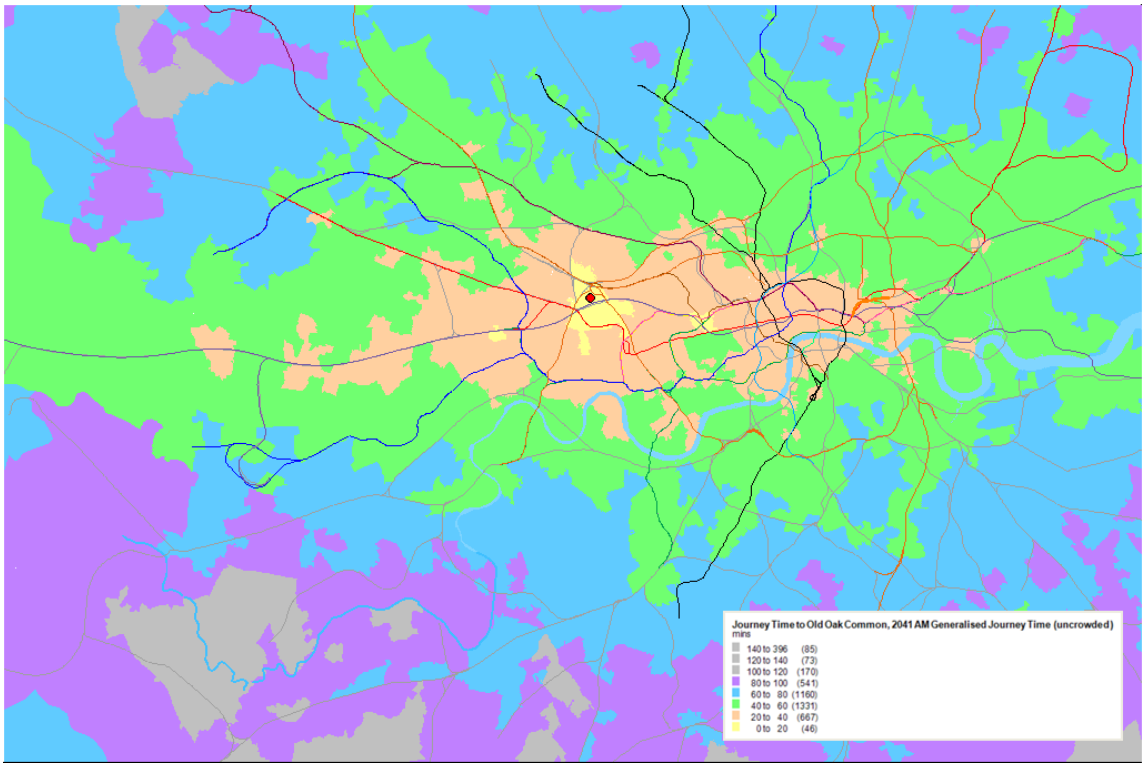


Figure 12: Catchment area to Old Oak in 2041 with the new Overground stations



3.57. Additional modelling has previously been undertaken to assess the increase in population and employment within 60 minutes of both Old Oak and Heathrow with the Overground stations in place. The results were derived from CAPITAL, TfL's strategic accessibility model, using travel times obtained from Railplan

3.58. Note that this analysis uses an earlier version of the modelling and will be updated in a future iteration of this business case, but this is unlikely to significantly affect the conclusions of the analysis. The outputs of the analysis are shown in Table 8.

Table 8: Impact of new Overground stations on population and employment accessibility

Measure	Number of people
Additional population within 60 mins of Old Oak	250,000
Additional population within 60 mins of Heathrow	108,000
Additional jobs within 60 mins of Old Oak	150,000
Additional jobs within 60 mins of Heathrow	45,000

Note: This analysis is based on a previous version of the Railplan modelling and will be updated in a future iteration of this business case

3.59. Table 8 shows the connectivity that will be provided at Old Oak through HS2 and Elizabeth line, and also shows the routes of London Overground services that currently pass through the Old Oak area. The orange corridors shown are the areas of London that would have relatively poor connectivity to Old Oak in the absence of Overground connections, which would constrain the growth of the Old Oak area and accessibility to HS2 and Elizabeth line.

3.60. The population catchment forecast to live within 60 minutes of Old Oak in 2031 is approximately 5.82 million. This includes the additional accessibility provided by the OOOS, which adds approximately 250,000 people to the 60 minute catchment area of Old Oak.

3.61. The new London Overground stations also add approximately 108,000 people to the 60 minute catchment area of Heathrow Airport.

3.62. The new London Overground stations also result in approximately 150,000 additional jobs being within the 60 minute catchment area of Old Oak and approximately 45,000 extra jobs within the 60 minute catchment area of Heathrow.

Wider transport benefits would also be delivered by OOOS

3.63. Improved rail connectivity between north / west / south west London and Heathrow could help Heathrow Airport Ltd demonstrate it can reduce poor air quality around airport by increasing rail mode share.

3.64. As noted earlier, the OOOS would directly support London's global city role by improving access from key residential areas of London to the West End, City, Canary Wharf and Stratford, and also Heathrow.

3.65. This scheme clearly supports resilience of the transport system by providing alternative routes eg between Richmond / Shepherd's Bush / Clapham Junction and central London, as well as the Euston lines discussed earlier.

3.66. Some journey times from the west of London would reduce to HS2 / GWR locations such as Birmingham, Manchester, Reading, Bristol via the proposed Old Oak interchange with LO services.

3.67. There is also a resilience benefit as OOOS would mean HS2 / GWR passengers would not be wholly reliant on the Elizabeth line for onward travel from Old Oak, although within central London GWR and HS2 passengers would have different alternative options in central London – with HS2 serving Euston and the Elizabeth line serving Paddington.

3.68. Interchange benefits could be further enhanced through increasing the range of LO services that would be provided at the OOOS. The demand generated at OOOS (both by the site itself and through interchange with the HS2 station) could in fact help make the case for some additional routes to be developed. Options that have been identified to date include the opening of freight only lines for new LO services to Brent Cross and Hounslow. These would give further OAs high quality connections to Old Oak and the excellent connections provided at the HS2 station, which could be a significant factor in making them into attractive investment locations for both residential and commercial development.

The case for change is clear: OOOS would deliver regeneration, economic, housing and transport benefits to London, bringing better connectivity and better prospects not just to west London but to London as a whole

3.69. Sections 2 and 3 have demonstrated a clear case for change. Multiple benefits would be delivered by providing interchange at Old Oak between the already planned HS2 and Elizabeth line services, and the London Overground.

3.70. Sections 4, 5 and 6 will review the potential performance of the preferred option.

Section 4: Strategic Case Part C - Determining the best option to meet the identified needs and so best deliver against the case for change

Section summary:

- Before considering a range of potential options for transport infrastructure, there is a need to identify the core objectives and outcomes
- Following successful lobbying from TfL, a feasibility study into potential Overground and Elizabeth line connections at Old Oak was completed jointly by HS2 Ltd, TfL and Network Rail, during 2011-12
- Following the feasibility study, a further study at the Network Rail (NR) Guidelines for Railway Improvement Projects (GRIP) stage 2 was undertaken by consultants on behalf of TfL and NR in 2013. This work took the shortlist of five options and suggested that three of these were not feasible
- Public consultation was undertaken in late 2014 to gauge support for both Overground connectivity at Old Oak in general and to gain an understanding of public support for the three options identified. Of the 1,200 responses, 95 per cent either supported or strongly supported the scheme
- Since Option C was selected in March 2015, the designs for the HS2/Elizabeth line/National rail station and for the commercial development surrounding Hythe Road station have been developed further. This has led to the requirement to assess sub-options at each station
- Option C, along with its sub options, have been assessed in the 2016 Business Case. The Business Case showed that all sub options for Hythe Road (1A to 1C) have similar Value for Money (VfM) ratings while option 2B has a significantly better VfM case than option 2A
- A public consultation on Option C was held in late autumn 2017

Before considering a range of potential options for transport infrastructure, there is a need to identify the core objectives and outcomes

4.1. There are two overarching objectives set out in Table 2 alongside the benefits which indicate how the success of the project can be measured.

Table 9: Objectives and benefits criteria for the OOOS

Objective	Main benefits
Transport Objective: Improve transport connectivity to the site and through interchange with HS2, Elizabeth line, and National rail services at the Old Oak Common HS2/Elizabeth line/National rail station	The OOOS would create orbital links between north, west and south west London and the Old Oak area along with new interchange opportunities with services available at the HS2/Elizabeth line/National rail station. The OOOS could bring more people within an hour of Old Oak whilst also improving links to other Opportunity Areas (OAs).
Regeneration Objective: Enhance the regeneration benefits that HS2/Elizabeth line/National rail services will bring to Old Oak	Large scale development at Old Oak will only take place if excellent transport connections are provided to a range of destinations within and beyond the Old Oak area. The new HS2/Elizabeth line/National rail station at Old Oak Common and the proposed London Overground stations will act as an enabler of growth in the immediate OA. The new stations could help facilitate large scale regeneration at Old Oak with up to 65,000 additional jobs and 25,500 homes created in the area. These benefits could be maximised by providing additional London Overground stations in the vicinity of the OA, which could increase the connectivity between railway services; creating more convenient connectivity to a wider range of destinations; and providing access to a range of rail services for residents, occupiers and visitors within the regeneration area.

4.2. In developing the station options at each station location some more detailed criteria have been developed which have been agreed with the key stakeholders and are being used to inform the option selection process:

i. permeability – sight lines and severance between the Overground stations and the HS2/Elizabeth line/National rail station;
ii. place making – assessment of the public realm around the stations;
iii. whole life cost – assessment of the assets assuming a 120-year life span;
iv. operational flexibility – the ability to deliver a flexible service for passengers;
v. impact on the operational railway – the impact on operations during construction;
vi. safety – the complexity of construction and assessment against railway regulations; and
vii. the business case – an assessment of the economic and social benefits, revenue and value for money compared to scheme costs.

Following successful lobbying from TfL, a feasibility study into potential Overground and Elizabeth line connections at Old Oak was completed jointly by HS2 Ltd, TfL and Network Rail, during 2011-12

4.3. A feasibility study into potential orbital connections at Old Oak, linking to the planned HS2/Elizabeth line/National rail station was completed jointly by HS2 Ltd, TfL and Network Rail, during 2010. This considered options related to the NLL and WLL of the London Overground, the London Underground Central and Bakerloo lines, new modes of transport, links to existing stations such as Willesden Junction and combinations thereof.

Following the feasibility study, a further study at the Network Rail (NR) Guidelines for Railway Improvement Projects (GRIP) stage 2 was undertaken by consultants on behalf of TfL and NR in 2013. This work took the shortlist of five options and suggested that three of these were not feasible

4.4. Following the feasibility study, it was concluded that a London Overground solution was the preferred option to provide orbital connections to the HS2/Elizabeth line/National rail station and the Old Oak area.

4.5. A further study at the Network Rail (NR) Guidelines for Railway Improvement Projects (GRIP) stage 2 was then undertaken on behalf of TfL and Network Rail in 2013. This work considered a long list of 27 distinct options developing a shortlist of five options.

Public consultation was undertaken in late 2014 to gauge support for both Overground connectivity at Old Oak in general and to gain an understanding of public support for the three options identified. Of the 1,200 responses, 95 per cent either supported or strongly supported the scheme

4.6. Following the study, three options were identified to be taken forward to public consultation. The three options identified were:

i. **Option A:** a new viaduct running to the north of Wormwood Scrubs, allowing West London Line (WLL) trains to join the North London Line (NLL), just south of Acton Wells Junction, with a single new station on the NLL adjacent to Old Oak Common Lane;

ii. **Option B:** WLL trains use the existing South West Goods lines to access a single new station on the NLL adjacent to Old Oak Common Lane, where WLL trains would reverse to continue their journey; and
iii. **Option C**: two separate stations, one on the NLL adjacent to Old Oak Common Lane and another on the WLL adjacent to Hythe Road, with pedestrian links to the HS2/Elizabeth line/National rail station.

4.7. Public consultation was undertaken in late 2014 to gauge support for both Overground connectivity at Old Oak in general and to gain an understanding of public support for the three options identified. Of the 1,200 responses, 95 per cent either supported or strongly supported the general proposition.

4.8. Option C was the most popular with respondents, with 59 per cent of respondents supporting or strongly supporting this. In addition, Option C had the lowest levels of opposition (18 per cent of responses either opposing or strongly opposing it).

Since Option C was selected in March 2015, the designs for the HS2/Elizabeth line/National rail station and for the commercial development surrounding Hythe Road station have been developed further. This has led to the requirement to assess sub-options at each station

4.9. The options considered for Old Oak Common Lane station are as set out below:
i. **Option 2A** – Old Oak Common Lane station with a sub-surface concourse. A grade level station with a low level concourse and its associated pedestrian links. The concourse will straddle the alignment of a HS2 subway.
ii. **Option 2B** – Old Oak Common Lane station with a high level concourse. A grade level station with a high level concourse and pedestrian links.

4.10. The options considered for Hythe Road station are as set out below:
i. **Option 1A** – Hythe Road station on existing embankment with connections (underpasses). Railway retained on its existing alignment with the station constructed on widened earthworks. Permeability of the embankment increased to development traffic by the provision of a minimum of three box culvert bridges as part of the proposal.
ii. **Option 1B** – Hythe Road station on a viaduct northern variant. Railway re-aligned onto a viaduct north of the existing embankment and designed as an elevated station.
iii. **Option 1C** – Hythe Road station on a viaduct southern variant. Railway re-aligned onto a viaduct south of the existing embankment and designed as an elevated station.

4.11. Each of the station design options was then assessed to determine the preferred option at each location. The Business Case assessment showed that all sub options for Hythe Road station (1A to 1C) had a similar Value for Money (VfM) rating while option 2B for Old Oak Common Lane station had a significantly better VfM case than option 2A. In operations terms, there was a marginal technical and operational preference for Option 1C the southern viaduct at Hythe Road station.

4.12. At Hythe Road station, given the wider objectives for the Old Oak area, which were reflected by stakeholders including the OPDC and London & Regional about Option 1C the southern viaduct (and TfL's aim to ensure sustainable transport options across the area to complement rail access), it was determined that Option 1B, the northern viaduct option, was preferred.

4.13. At Old Oak Common Lane station, due to the high costs, lower VfM and anticipated construction impact of building Option 2A the underpass on the existing operational railway; Option 2B the overbridge was preferred.

Option C, along with its sub options, have been assessed in the 2016 Business Case. The Business Case showed that all sub options for Hythe Road (1A to 1C) have similar Value for Money (VfM) ratings while option 2B has a significantly better VfM case than option 2A

4.14. The designs of the preferred options have subsequently been further developed and refined. The options assessed in this business case are based on the GRIP 3B design of Option 1B for Hythe Road and Option 2B for Old Oak Common Lane.

A public consultation on Option C was held in late autumn 2017

4.15. A public consultation was held in late autumn 2017. This presented the preferred options of 1B for Hythe Road station and 2B for Old Oak Common Lane station alongside supporting information setting out the pros and cons of all design options considered. Of the 911 responses to the public consultation:

v. 94 per cent of respondents supported or strongly supported the provision of both stations
vi. 92 per cent of respondents supported or strongly supported the provision of Old Oak Common Lane station
vii. 86 per cent of respondents supported or strongly supported the provision of Hythe Road station
viii. 88 per cent of respondents supported or strongly supported the provision of a link between Old Oak Common Lane station and Victoria Road

Section 5: Strategic Case Part D - Summary of the preferred option C and sub-options 1B and 2B

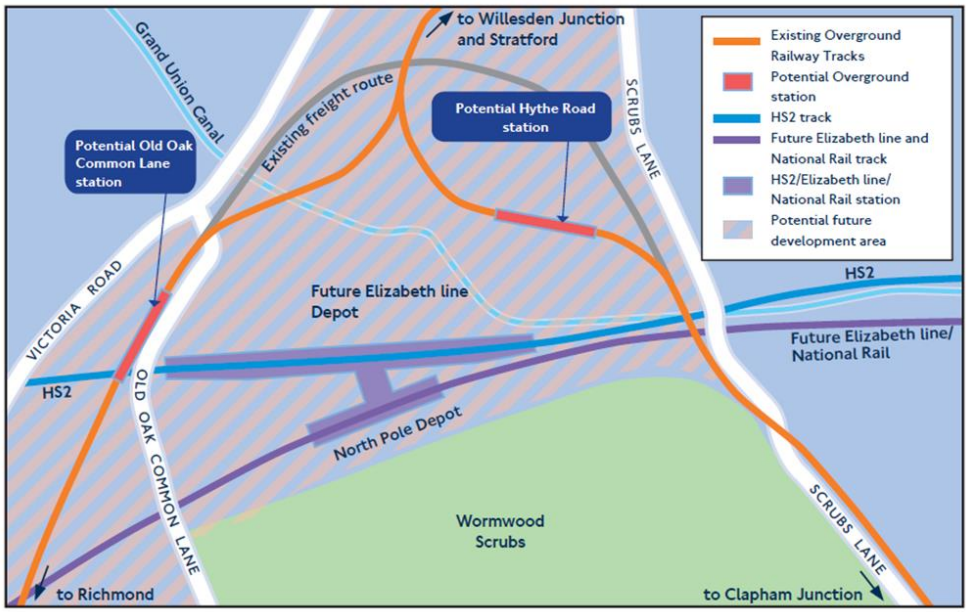
Section summary:

- **The proposed scheme involves the construction of a new station at Old Oak on each of two orbital railway lines that pass through the area, carrying existing London Overground (LO) passenger services**

The assessed scheme involves the construction of a new station at Old Oak on each of two orbital railway lines that pass through the area, carrying existing London Overground (LO) passenger services

5.1. Old Oak Common Lane Station, on the North London Line (NLL), would be served by LO trains on the Stratford to Richmond route while Hythe Road Station, on the West London Line (WLL), would be served by LO trains on the Stratford to Clapham Junction route. Figure 1 shows the proposed locations of the two stations.

Figure 13: Proposed locations of the OOOS (Option 1B and Option 2B)



5.2. The OOOS would provide high quality orbital public transport connections between the major commercial and residential development planned at Old Oak and areas of south west, west, and north London served by the existing LO routes.

5.3. These areas would not be as easily accessed through rail services available at the planned Old Oak Common HS2/Elizabeth line/National rail station. The OOOS would also offer these wider areas of London improved connections to other locations by providing opportunities for interchange with the radial cross-London and long distance services available at the HS2 station.

5.4. Further orbital connectivity could also be provided through the OOOS in the future if potential new Overground routes between Old Oak and areas such as Brent Cross and Hounslow are developed.

Section 6: Strategic Case Part E - Strategic Policy Fit

Section summary:

- **OOOS preferred option C and sub-options 1B and 2B deliver against European policy objectives**
- **OOOS preferred option C and sub-options 1B and 2B deliver against national policy objectives**
- **OOOS preferred option C and sub-options 1B and 2B deliver against London-wide policy objectives**
- **OOOS preferred option C and sub-options 1B and 2B deliver against the Mayor's specific policy objectives for Old Oak and Park Royal Development Corporation**
- **OOOS preferred option C and sub-options 1B and 2B deliver against local policies**

OOOS preferred option C and sub-options 1B and 2B deliver against European policy objectives

Trans-European Transport Network (TEN-T)

6.1. The Trans-European Transport Network (TEN-T) is a European Commission policy directed towards the implementation and development of a Europe-wide network of roads, railway lines, inland waterways, maritime shipping routes, ports, airports and rail-road terminals.

6.2. The objective of TEN-T is to close gaps, remove bottlenecks and eliminate technical barriers that exist between the transport networks of EU Member States, strengthening the social, economic and territorial cohesion of the Union and contributing to the creation of a single European transport area. The policy seeks to achieve this aim through the construction of new physical infrastructures; the adoption of innovative digital technologies, alternative fuels and universal standards; and the modernising and upgrading of existing infrastructures and platforms.

6.3. It consists of two planning layers:

i. The Comprehensive Network: Covering all European regions
ii. The Core Network: Most important connections within the Comprehensive Network linking the most important nodes

6.4. TEN-T policy identifies nine Core Network Corridors, each of which was identified to streamline and facilitate the coordinated development of the TEN-T Core Network. The proposed OOOS are located within the North Sea – Mediterranean Corridor and would provide a connection to the planned HS2 rail line, which will become a key part of the Corridor.

6.5. In recognition of the OOOS potential contribution to enhancing the Ten-T North Sea – Mediterranean Corridor, the development of the scheme has been co-funded by the European Commission through the Connecting Europe Facility (CEF). The CEF instrument is intended to finance key projects that contribute to the realisation of the Trans-European Transport Network by upgrading infrastructure and removing existing bottlenecks whilst also promoting sustainable and innovative mobility solutions.

OOOS preferred option C and sub-options 1B and 2B deliver against national policy objectives

Laying the Foundations: A Housing Strategy for England (November 2011)

6.6. Published by the Department for Communities and Local Government in November 2011 this strategy sets the impetus at a national level to increase the country's housing supply. It recognises that in recent years, supply has exceeded demand and this has had an adverse impact on affordability, in London and the South East in particular. It makes the case for a thriving, active but stable housing market and the need to get the housing market and in particular new house building moving again.

National Planning Policy Framework (NPPF) (March 2012)

6.7. The NPPF places significant weight on the planning system's role to deliver sustainable economic growth. The planning system is to contribute to 'building a strong, responsive and competitive economy' which is partly achieved through 'identifying and coordinating development requirements, including the provision of infrastructure' (Paragraph 7). Planning should operate to encourage, and not impede, sustainable growth and to proactively meet the development needs of business.

6.8. The NPPF outlines 12 principles that should underpin plan-making and decision taking (Paragraph 17). The following are of relevance to this study:

i. 'proactively drive and support sustainable economic development' and make 'every effort to objectively identify and then meet the housing, business and other development needs of an area, and respond positively to wider opportunities for growth'; and

ii. 'actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable.'

Building Our Industrial Strategy Green Paper (January 2017)

6.9. The Government's Industrial Strategy Green Paper considers investment in economic infrastructure to be a key part of the emerging industrial strategy owing to its long-term transformative potential and its capacity to support other objectives such as economic rebalancing. Pillar 3 'Upgrading infrastructure' establishes the need to improve performance standards on transport infrastructure, amongst others, and more effectively align central government investment with local economic growth priorities to boost local productivity and support places that have suffered historical underinvestment.

6.10. The Green Paper cites the significant role of HS2 in attracting new investments and driving major regeneration.

6.11. Furthermore, Pillar 4 'Supporting business to start and grow' sets out the Government's commitment to create the 'right conditions for companies to invest for the long term'.

OOOS preferred option C and sub-options 1B and 2B deliver against London-wide policy objectives

The Mayor's policy frameworks

6.12. There is a clearly defined policy framework for London which looks forward to 2031 and defines the key challenges that London has to address over this period.

6.13. This is set out in the London Plan (the Mayor's spatial development strategy) and the Mayor's Transport Strategy (MTS). Finalised in 2011 and 2010 respectively, together they provide a clear policy direction through to 2031.

6.14. These two documents provide the statutory framework for the boroughs to develop their own local development frameworks.

6.15. The overall thrust of these documents is that London is a growing city, with growth at the highest levels since the inter-war period. There is a focus on generating jobs and growth to meet the demands of a rising population, and transport is a critical component in helping to achieve this.

6.16. Investment in transport has been a catalyst for development in London, for example, the expansion of the DLR and Jubilee line extension which stimulated and supported huge employment growth in east London, and the more recent extension of the South London and East London lines. It is essential that this trend continues into the future, and further investment in public transport capacity is a fundamental part of this strategy.

6.17. Providing sufficient housing to meet current and future demand is a key priority of the Mayor, the Government and London Boroughs. To this end, the London Plan, the regional spatial strategy for London, has set a minimum target to deliver 42,000 new homes a year in London to 2025.

London Plan May 2011 (reviewed and consolidated March 2016)

6.18. The London Plan is the overall strategic plan for the city's integrated economic, environmental, transport and social development over the next 20–25 years. Under the Plan's vision, London will meet the challenges of economic and population growth and offer 'easy, safe and convenient access to jobs, opportunities and facilities with an efficient and effective transport system'.

6.19. Policy 4.1 Developing London's Economy outlines the Mayor's commitment to promoting and enabling continued economic development - partly through ensuring the availability of supporting infrastructure - and to maximising benefits from new infrastructure to secure sustainable growth and development.

6.20. The Plan draws attention to the fundamental role of transport in addressing the full range of policy priorities and its implications for places - transport has major effects, 'especially around interchanges', and can be critical to the success of places.

6.21. Policy 6.1 outlines a Strategic Approach for the closer integration of transport and development, including: improving the capacity and accessibility of public transport in areas of greatest demand; supporting development that generates high levels of trips at locations with either current or committed good public transport accessibility and/or capacity; and improving interchange between different transport modes, particularly around major rail and Underground stations and where this will enhance connectivity in Outer London.

6.22. The Mayor is committed to improving public transport links and capacity to enhance London's transport connectivity and support development and regeneration priority areas (Policies 6.4, 6.2). This includes upgrading and extending the Underground network, enhancing the Overground network, and improving access by public transport to international rail termini. The benefits of Crossrail should be maximised by coordinating public investment to prioritise interventions which offer further regeneration benefits to areas around key stations.

6.23. Spatially, the economic strategy promotes the continuing regeneration of inner London to redress concentrations of deprivation, and outer London as an attractive location for business. Old Oak Common and Park Royal, located in both inner and outer London, are designated Opportunity Areas, holding significant growth potential which can be realised through and should be supported by public transport accessibility, including Crossrail and making better use of existing infrastructure (Policy 2.13).

6.24. Old Oak Common holds potential to make a major contribution to London's position as a world business centre owing to its capacity for up to 55,000 new jobs and over 24,000 new homes, whilst Park Royal offers opportunities for logistics and industrial related development and mixed use intensification, and has indicative capacity for 10,000 jobs and at least 1,500 new homes.

6.25. The development of Park Royal and Old Oak Common Opportunity Areas should be integrated and consider relationships with White City and Kensal Canalside and the scope for improvements in strategic rail accessibility.

A City for all Londoners

6.26. The Mayor's precursor to the New Mayor's Transport Strategy published in 2017, a City for All Londoners articulates a clear policy for the continued need for infrastructure to support housing delivery.

6.27. It states that new housing will be planned where new transport links are going to be constructed and that new investments should act as catalysts for regeneration and introduce new opportunities for communities beyond central London.

Mayor's Draft Transport Strategy Draft for Public Consultation (June 2017)

6.28. The Draft Strategy emphasises the fundamental role of transport in supporting the 'good growth' of London's economy, to deliver the additional 1.2 million jobs and over 1 million homes required by 2041.

6.29. This includes the use of transport to create high-density mixed use places and unlock growth potential in underdeveloped parts of the city (Policy 19).

6.30. Investment will take the form of new connections alongside improving existing public transport services. The Mayor proposes to transform London's rail-based services (Policy 14) through improving capacity on the Underground, encouraging integration and multi-modal interchange hubs, and improved orbital connectivity, for which Old Oak is identified as a potential priority.

6.31. Opportunity Areas should embed 'good growth' through dedicated public transport provision and good interchanges with rail and Underground services offering connections to nearby employment hubs, stations and other amenities. Opportunities should be seized for new rail stations that will unlock the potential for significant employment creation.

6.32. The significant investment in transport infrastructure around Old Oak, including potential interconnections with Overground and Underground services, is considered a catalyst for development opportunities in the largest regeneration area in the UK and essential to protect and intensify industrial activity in Park Royal. It also enables the area to act as a national and international gateway for travellers arriving from HS2 and Heathrow.

London Infrastructure Plan 2050 (March 2015)

6.33. The 2014 consultation document establishes the objective for long-term strategic transport investments to support London and the UK's economy. The Plan supports the strengthening of London's economic centre through expansion beyond its traditional borders, with the development of 'a few very well connected locations' such as Old Oak Common, where growth may be catalysed by HS2, Crossrail and Overground connections.

6.34. Investment in radial public transport, including to increase the capacity of the Underground network, is considered vital.

6.35. The March 2015 Update reports that transport investment is to continue to facilitate employment growth in new clusters of high density employment vital to London's economy, including Old Oak Common.

London Economic Action Partnership (LEAP) London 2036: An Agenda for Jobs and Growth (January 2015)

6.36. LEAP, the local enterprise partnership for London, identifies strategic actions to support and lead economic growth and job creation, one of which is addressing weaknesses in infrastructure. It finds that substantial investment in an effective, integrated transport system needs to be maintained to attract and retain talent, make viable new areas for development, and spread growth to previously neglected parts of the city.

The Mayor's Economic Development Strategy for London (May, 2010)

6.37. The Economic Development Strategy published in May 2010 pointed out that some of the Opportunity Areas identified in the London Plan are in clusters, which will offer major focal points for economic development. In outer London, these include the Park Royal/Willesden Junction and the wider Heathrow area amongst the others. The Mayor will work with boroughs, the HCA, private developers and other partners to support the production and implementation of planning and investment strategies for these areas.

OOOS preferred option C and sub-options 1B and 2B deliver against the Mayor's specific policy objectives for Old Oak and Park Royal

Old Oak and Park Royal Opportunity Area Planning Framework (OAPF) (November 2015)

6.38. The OAPF provides supplementary detail and additional guidance to London Plan policies. The OAPF envisages the large scale regeneration of Old Oak and Park Royal to make a 'significant contribution to London's competitiveness, in a way that is sustainable, attracts long term investment, meets local needs, and supports the strategic long-term priorities' of the London Plan, as well as to unlock additional regeneration in the wider area.

6.39. The OAPF Transport Strategy states that development should provide substantial new capacity to existing Overground and Underground stations, new Overground station(s) and supporting infrastructure (Principle T1). This is regarded as essential to maximise the potential of the new interchange in the following ways:

6.40. Providing local and sub-regional connections;

i. Extending the catchment area for new commercial activities by bringing an additional 250,000 people and 150,000 jobs within an hour's journey of Old Oak and Park Royal;
ii. Supporting high density residential and commercial development; and
iii. Accommodating development without compromising the operation of other parts of the rail network - including mitigating pressure on nearby stations such as Kensal Green and Harlesden - and offering enhancements such as congestion relief at London Euston.

6.41. New Overground stations providing access to North and West London Line services would have the specific benefits of:
i. Reducing crowding effects of HS2 in central London;
ii. Facilitating regeneration across the Old Oak Common site, with potential creation of up to 20,000 additional jobs; and
iii. Providing a new strategic transport interchange for west London, with improved access to the Elizabeth line and HS2 and connectivity to other Opportunity Areas.

Draft Development Capacity Study (February 2016)

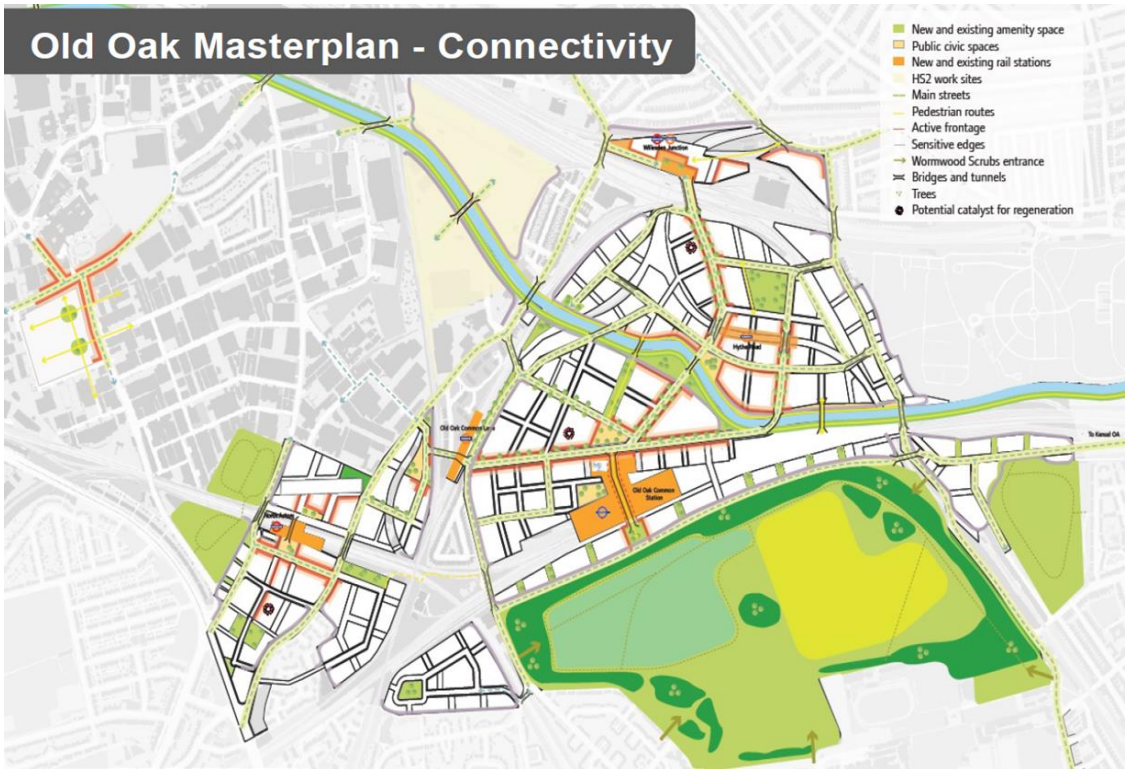
6.42. The draft development capacity study (DCS) provides early indicative capacity information and phasing for new homes and employment workspace within Old Oak and Park Royal. The Study projects the creation of over 59,000 new jobs in Old Oak (primarily office based jobs) and 12,000 new jobs in Park Royal (primarily industrial jobs). Most of these new jobs are projected to be delivered between 2022 and 2037.

6.43. Public transport improvements in Old Oak and Park Royal including the new stations at Old Oak Common Lane and Hythe Road will enable and justify the delivery of high density developments in the area. The employment density assumptions presented in the Study include:
i. Office jobs: 11.5 square metres per full time employee;
ii. Industrial jobs: 20 - 43 square metres per full time employee; and
iii. Retail / leisure jobs: 18.5 square metres per full time employee.

The Old Oak Masterplan

6.44. The Old Oak draft Masterplan (2017) in **Figure 14**Figure 14 shows the enhanced connectivity by the new Overground stations at Old Oak Common Lane and Hythe Road.

Figure 14: Old Oak Masterplan[20]



Local Plan Revised Draft for Regulation 19 Consultation, June 2017

6.45. The Local Plan envisages Old Oak and Park Royal as 'a highly connected part of London, playing an important role in shaping west London's future and driving national economic growth'. The two features are interdependent; the new Old Oak Common station will provide an 'unparalleled catalyst' for Transit Oriented Development (TOD). It is essential that this is supported by significant investment in rail capacity through new (Hythe Road and Old Oak Common Lane) and improved rail stations (such Willesden Junction and North Acton).

6.46. Public transport access will in turn enable the optimisation of high density development, creating 67,900 new jobs across a range of employment sectors between 2018 and 2038 and contributing to the local, London and UK economy (Policy SP7).

[20] OPDC is currently updating the masterplan which is due to complete in 2018.

OOOS preferred option C and sub-options 1B and 2B deliver against local policies

6.47. Planning policies of the London boroughs of Brent, Ealing and Hammersmith & Fulham direct the development of Old Oak Common and Park Royal's surrounding area and, until the adoption of the OPDC Local Plan, the OPDC area itself.

London Borough of Brent

Core Strategy Adopted 12th July 2010

6.48. The Core Strategy establishes Brent's development objective up to 2026 to become 'fully integrated into the city with excellent public transport interchanges and connections to other strategic centres in London'. It emphasises the importance of public transport provision to stimulate economic regeneration and provide for the demand created by new development whilst avoiding exacerbating the borough's road traffic problem.

6.49. The Strategy's approach to sustainable growth is for it to be concentrated within areas that have good public transport access, that have the capacity to accommodate growth, are in need of regeneration, and can deliver both jobs and vital supporting infrastructure, including public transport. Key objectives for the development of Park Royal are thus improved orbital public transport links to Wembley, an interchange between the Piccadilly Line and a new Central Line station, and other improvements to public transport accessibility, required to encourage the development of office employment (Policy CP12). In addition, regeneration should minimise the impact of industrial and employment use on the road network (Policy CP20).

Brent Employment Land Demand Study 2015

6.50. The Brent Employment Land Demand Study found that the majority of sites in Park Royal suffer poor or very poor public transport access (122.5 ha falling in those categories compared to 11.0 ha with good/very good access).

6.51. This is significant as the area is the largest industrial area in London and a key driver of demand for the industrial market.

Brent Long Term Transport Strategy (LTTS) 2015-2035

6.52. The LTTS provides a strategic direction for investment in transport throughout Brent to 2035. Growth and regeneration is a key priority; Brent strongly supports the inclusion of Overground services to Old Oak Common interchange through the provision of new stations and improvements to existing stations and services, which will offer improved interchange accessibility and support regeneration of Old Oak area and the wider locality.

London Borough of Ealing

Core Strategy Development Plan Document Adopted 3rd April 2012

6.53. The Core Strategy sets out a vision for the development of Ealing to 2026. Ensuring the benefits of Crossrail to the borough are maximised is a key objective (Policy 1.2(e)). These include improved accessibility and public transport capacity and potential contribution to regeneration. Growth will also be supported by improving connectivity to development hubs and promoting ease of north-south orbital and east-west radial travel across the borough, where possible interconnected with Crossrail (Policy 6.1).

6.54. The A40 / Park Royal corridor, including Park Royal Estate, is a focal point for the sustainable development of new homes, business and retail space (Policies 3.1, 3.3). The plans for Park Royal's Southern Gateway (Policy 3.4) seek to enable efficient movement and clear routes between the strategic industrial location and surrounding area, in doing so creating a focal point for businesses, with up to new 2,000 office jobs. Building on the Elizabeth line, public transport interchange would facilitate more intensive employment development across the whole area.

Ealing 2026 Infrastructure Delivery Plan (IDP) Version 2 July 2011

6.55. The IDP identifies the infrastructure needed to ensure the sustainable delivery of Ealing's Core Strategy. Challenges for the transport system include investment in public transport to support population and employment growth, especially in town centres and employment areas; improving public transport access in areas of poor accessibility and/or congestion; and improving efficiency and traffic flow.

London Borough of Hammersmith & Fulham

Proposed Submission Local Plan (Regulation 19) September 2016

6.56. When adopted, the Local Plan will replace the existing Core Strategy to help shape the future of the borough and deliver development. Strategic objectives include regeneration and building a stronger local economy through encouraging inward investment and job growth.

6.57. The proposed level of population and employment growth will necessitate increased investment in public transport to improve accessibility, including improvements to the Overground and Underground network and the provision of complementary new infrastructure (Policy T1).

6.58. The proposed HS2/Elizabeth line/National rail station at Old Oak Common, a part of the borough currently suffering relatively poor public transport accessibility, is supported for its potential to deliver a significant increase in public transport capacity and act as a catalyst for the sustainable development of up to 25,500 homes and 65,000 jobs across Old Oak and Park Royal. The Plan also supports interchange with the West London Line and Underground at this location.

Core Strategy 2011

6.59. The Core Strategy envisages a borough 'transformed through public and private investment by 2031'. Old Oak Common is a focal point for growth which, in combination with four other regeneration areas, could provide 25,000 jobs and 13,200 homes during the period 2021-2031 (Strategic Policy A).

6.60. The Strategy emphasises the dependence of continued local economic growth and regeneration on improvements in public transport access - particularly in the relatively poorly accessible north of the borough - and the reduction of adverse effects of traffic congestion. Another key challenge is the overcrowding of rail services.

6.61. Development of intensive employment uses in Old Oak Common is contingent on improved public transport accessibility and capacity (Strategic Policy B, Policy T1). The Strategy seeks the creation of a major transport node linking Crossrail and HS2 to the Overground West London Line.

Section 7: Economic Case

Section summary:

The Economic Case for the Old Oak new Overground stations has been prepared following the guidance set out in the Department for Transport's (DfT) WebTAG and TfL's Business Case Development Manual (BCDM)

The economic appraisal presented in this economic case focuses on the combined impacts of the delivery of the two new Overground stations at Hythe Road on the West London Line (WLL) and Old Oak Common Lane on the North London Line (NLL)

- **The assessment of the new Overground stations at Old Oak has confirmed that there is potentially a positive business case for Old Oak Common Lane, either delivered in isolation or together with Hythe Road. The case for Hythe Road is less clear.**
- **The economic case for Hythe Road station is strongly influenced by the development demand. With the full scale of development as set out in the Old Oak and Park Royal Development Corporation's (OPDC) Opportunity Area Planning Framework (OAPF) and wider economic benefits this would deliver a benefit cost ratio of 1.4 to 1 which is 'Low Value for Money' using London values of time;**
- **The economic case for Old Oak Common Lane is heavily influenced by HS2 demand. The full scale of development of the Old Oak area and the wider economic benefits would result in a benefit cost ratio of 3.5 to 1 which is considered 'High Value for Money' using London values of time;**
- **When the two stations are delivered together, the scheme would achieve a 'High Value for Money' with a benefit cost ratio of 2.2 to 1 including the wider economic benefits using London values of time.**
- **If the costs of viaduct are excluded, Hythe Road would have a positive business case with a BCR of 2.6 to 1 including wider benefits and demonstrating 'High Value for Money'.**

7.1. The economic case is structured into following sections

i. Methodology;
ii. Option assessment;
iii. Economic appraisal approach;
iv. Public transport modelling output;
v. Economic appraisal results;
vi. Sensitivity tests;
vii. Conclusion.

Methodology: The Economic Case for the Old Oak new Overground stations has been prepared following the guidance set out in the Department for Transport's (DfT) WebTAG[21] and TfL's Business Case Development Manual (BCDM)

7.2. The purpose of the economic case is to determine whether the Old Oak new Overground stations will be beneficial to the UK economy relative to their costs. Measures used to express the economic case for each assessed option include the Net Present Value (NPV) and the Benefit to Cost Ratio (BCR).

The economic appraisal presented in this economic case focuses on the combined impacts of the delivery of the two new Overground stations at Hythe Road on the West London Line (WLL) and Old Oak Common Lane on the North London Line (NLL)

7.3. The timing of construction and opening of the two stations is still subject to further discussion between TfL, OPDC and Network Rail, therefore a number of different scenarios for different delivery timeframes have been assessed.

In each of the scenarios modelled, allowing for commissioning, it has been assumed that Old Oak Common Lane would open in 2026, but three different opening dates for Hythe Road have been considered

7.4. These include an earlier opening date in 2023 or a 2026 opening alongside Old Oak Common Lane or a later opening in 2036 once additional demand from adjacent development has built up. However, initial modelling results have shown that the impacts of phased opening are negligible therefore they are not presented in this document.

7.5. For this reason, the opening year of 2026 is assumed for Hythe Road in the appraisal. Construction costs are spread over the construction period. The economic appraisal is presented in 2010 prices and discounted to 2010 present values and prices.

[21] WebTAG – Web (internet) base Transport Appraisal Guidance – https://www.gov.uk/transport-analysis-guidance-webtag

All scenarios assessed are compared to the same base case or 'Do Minimum' scenario and the benefits and costs are calculated in terms of changes from the Do Minimum

7.6. The Do Minimum for the Old Oak new Overground stations comprises the current public transport network, stations, and method of operation, but takes into account forecast population and employment growth and travel changes including the development plans for the Old Oak area as specified by the OPDC.

7.7. The Do Minimum also assumes funded public transport schemes that will be delivered regardless of plans for the Old Oak new Overground stations. This include the HS2 services including its station at Old Oak Common and the Elizabeth line/National rail station at Old Oak Common and the changes to services required to enable it to be served. An additional 2 trains per hour (tph) London Overground service has recently become committed.

7.8. It is expected to be introduced in 2018, comprising 1 tph between Stratford and each of Richmond and Clapham Junction at peak times. This has also been included in the Do Minimum. In addition, committed bus network enhancement associated with the Old Oak development has also been included.

7.9. The Do Minimum varies between modelled years with committed schemes included in only the years after they are expected to open.

The Old Oak new Overground stations assessments are the 'Do Something' scenarios, which also use the same population growth and travel change assumptions as the reference case

7.10. A number of growth scenarios have been assessed for the Do Something scenarios, including the 'London Plan Growth' and the 'Development Demand Growth'. The 'Development Demand Growth' includes committed development as set out in the 2015 Old Oak and Park Royal Opportunity Area Planning Framework (OAPF) - therefore this is considered as the core growth scenario in the appraisal.

7.11. This too is assessed for a period of 60 years from implementation to enable the comparison with the 'Do Minimum' to be made. The 60-year appraisal period reflects the long asset life of physical infrastructure schemes.

7.12. The assessment of the project's benefits comprises two levels of assessments. Level one is an assessment of conventional transport economic efficiency benefits to inform the 'initial BCR', which includes changes in user travel times (including crowding), vehicle operating costs, user charges and greenhouse gas emissions (CO2). Additional areas of benefits are included in level two to inform the 'adjusted BCR' which includes Wider Impacts (WIs) with fixed land use, namely: agglomeration, output in imperfect competition and labour market impact. These benefits will be explained in more detail later in this section.

Costs assessed at this stage include the capital, operating and maintenance costs and asset renewal costs for the new Overground stations at Old Oak

7.13. The monetised public transport benefits included in the present economic appraisal are derived from the Railplan model prepared by TfL to forecast the effects of the implementation of the Old Oak new Overground stations. This version (V7) of the model is built on the one that has been used for the Overground Capacity Study (Summer 2016), which is in turn derived from the Elizabeth line business case update, to ensure consistency between projects.

7.14. The model determines likely patronage based on local demographic information, changes in journey time and quality of service indicators. As well as assessing the reassignment of trips on the network resulting from the scheme implementation, generated public transport trips are also forecast, reflecting the impacts of mode shift, trip redistribution and trip generation. Changes in generalised journey time are used to calculate the public transport user benefits of the scheme, using a bespoke spreadsheet model developed by TfL for the Elizabeth line business case, which has been approved for use by the DfT.

Using the tools and processes above, the assessment of the value for money of the Old Oak new Overground stations has been carried out by calculating the project's NPV and BCR.

7.15. In addition to the WebTAG compliant assessment described above, an assessment has also been carried out using TfL's Business Case Development Manual (BCDM) guidance. The main difference is that TfL's guidance uses London specific values of time to reflect the higher productivity of people working within London.

7.16. This provides a better indication of the true benefits of the scheme in London, but means that the scheme cannot be compared on a like-for-like basis with other schemes elsewhere in the UK. Both assessments (DfT and TfL methodology) should be taken into account when reviewing the case for the scheme.

Due to the uncertainties of funding and delivery of the scheme, the Economic Case will assess three station combination options to understand the full range of Value for Money impacts

7.17. The station combinations assessed are as follows:

i. Do Something 1 (DS1) – both Hythe Road and Old Oak Common Lane stations to open at 2026;
ii. Do Something 2 (DS2) – open Hythe Road station only, at 2026; and
iii. Do Something 3 (DS3) – open Old Oak Common Lane station only, at 2026.

Hythe Road station - description

7.18. Hythe Road is a potential new station located about 700 metres from the proposed Old Oak Common HS2/Elizabeth line/National rail station. The station is located on the route known as the 'West London Line' (WLL) running between Willesden Junction and Clapham Junction and would be served by the Overground and a DfT franchised operation (currently Southern).

7.19. The station would be located on a new alignment and viaduct slightly to the north of the existing West London Line. Hythe Road would provide a link from the station to Scrubs Lane which is a key existing bus corridor. The station would have three platforms to allow for both terminating and through services.

Old Oak Common Lane station - description

7.20. Old Oak Common Lane is a potential new station located about 350 metres from the proposed Old Oak Common HS2/Elizabeth line/National rail station. Access would be from the adjacent Old Oak Common Lane and Midland Terrace. Bus stops on Old Oak Common Lane would provide the ability for passengers to interchange with bus services. A two platform station would be provided with an elevated ticket hall and concourse.

7.21. The station would be served by Overground services running between Richmond and Stratford via Willesden Junction being located on the route known as the 'North London Line' (NLL).

The approach of the economic appraisal for the Old Oak new Overground stations has been undertaken in a structured manner to capture the range of monetised impacts at two levels reflecting decreasing levels of certainty associated with the analysis

Monetised impacts level 1: Initial BCR (Typically Monetised Benefits)

7.22. This appraisal includes impacts that are typically monetised for transport schemes, comprising:

i. transport user journey time savings including changes in in-vehicle time, wait time and walk time;
ii. road decongestion benefits;
iii. car operating cost savings;
iv. indirect tax;
v. accident saving benefits; and
vi. emissions, air quality and noise benefits.

Monetised impacts level 2: Adjusted BCR (Other Transport and Economic Benefits)

7.23. Additional areas of benefits are included to inform the 'adjusted BCR' which includes Wider Economic Impacts (WEIs) with fixed land use, namely:

i. Agglomeration;
ii. Output in imperfect competition;
iii. Labour market impacts.

A sound modelling approach underpins this Economic Case with the assessment of passenger demand and benefits arising from the new Overground stations in the Old Oak area being calculated using TfL's demand forecasting tools: LTS, Railplan and a bespoke mode shift and generation tool

7.24. TfL operates an extensive suite of demand forecasting tools for London's transport networks. The specific tools used for this Economic Case are:

i. the London Transportation Studies (LTS) model;
ii. TfL's regional Railplan model; and
iii. A bespoke mode shift and generation tool.

London Transportation Studies (LTS) model

7.25. The London Transportation Studies (LTS) model is the strategic demand model for London which provides the overall growth in travel demand between base and future forecast year giving the origin/destination distribution and allocation of demand to public transport and highway modes based on the level of service offered by each mode.

7.26. Demand matrices from LTS are used for more detailed forecasting within the Railplan public transport assignment model which has been used to forecast the passenger demand at the new stations using the reassignment process to redistribute public transport demand.

7.27. A bespoke mode shift and generation tool has been used to estimate the increase in public transport demand arising from the introduction of the new stations.

The Railplan model

7.28. The Regional Railplan model is a public transport assignment model that takes account of changes in capacity, journey time, service frequency and new journey opportunities to show how passenger volumes on the public transport network change. It is one of the key public transport models used by TfL to predict changes in travel demand in the London area.

7.29. Railplan is a strategic model that allows the production of outputs that can be used to inform business cases for a range of public transport schemes. The model has been used to assess the case for a wide range of schemes including the Elizabeth line, the Thameslink Programme, the Jubilee line extension, the East London line extension and various assessments in relation to London Overground.

7.30. The model represents the public transport network within the M25 to a high level of detail, and includes a lesser level of detail outside of this area.

7.31. It includes the following modes:
i. the National rail network within London and the South East covered in detail, with a coarser representation over the rest of the UK;
ii. the full LU network;
iii. the London bus network;

iv. London Overground, Docklands Light Railway and Tramlink; and
v. key walk links to allow passengers to interchange between services on-street.

7.32. In the case of London Overground, LU, DLR, Tramlink and buses all stations/stops are coded, and in the case of National rail all stations within the M25 are coded, with some stations including a number of nodes to represent different platforms.

7.33. This work has used Railplan models for two time periods. These are the morning peak period (07:00 to 10:00) and interpeak period (10:00 to 16:00).

7.34. For the Overground Capacity Study and Old Oak new Overground stations work, a specific effort has been made to validate the Railplan model against observed data on the London Overground network. This has ensured that the model represents actual passenger flows satisfactorily, providing the necessary confidence that passenger demand and movement patterns is modelled robustly in future years to assess interventions.

'Typically Monetised Benefits': road decongestion, car operating cost, emissions, air quality, noise and accident savings benefits are all calculated based on the modal transfer from other modes, calculated by the mode choice model from car to public transport

7.35. These benefit calculations use WebTAG methodologies and assumptions:

i. **Road decongestion benefits**: The car vehicle kilometres removed from the road network are calculated and then the marginal cost of road decongestion is applied.
ii. **Car operating costs**: Calculates the savings in fuel and non-fuel costs to apply to the reduction in car vehicle kilometres. The impact of fuel duty savings is also captured as a cost to the Exchequer.
iii. **Accident savings**: The reduction in car vehicle kilometres is calculated and hence the number of serious injuries or fatalities that no longer occur. This is then balanced with the increase in the number of serious injuries or fatalities for public transport modes. This usually results in an accident rate saving as public transport is an inherently safer mode. A value per accident and fatality is then used to calculate the accident savings.
iv. **Noise and local air quality Impacts**: Calculates the reduction in car vehicle kilometres and increase in public transport kilometres and then applies values from WebTAG to calculate the net noise and local air quality impacts.

'Other transport and economic benefits': the wider economic impacts have been reported on the basis of the 'Wider Impacts' methodology set out in WebTAG

7.36. The wider economic impacts have been modelled using a bespoke spreadsheet model based on outputs from the Railplan model:

i. **Agglomeration calculations** attempt to quantify productivity changes that result from increased clustering of business activity, and better matching between business needs and skills availability. Agglomeration benefits are reported at Local Authority level and are calculated using WebTAG.

ii. **Imperfect competition benefits** quantify the increase/decrease in output by firms resulting from changes in transport costs. They represent the welfare gain achieved as consumers' willingness to pay for the increased output will exceed that of producing it.

iii. **Labour supply impacts** consider commuting costs as factor for an individual to join/leave the workforce. If commuting costs reduce this may incentivise an individual to join the workforce and labour supply impacts quantify the taxation impact of individuals joining/leaving the workforce.

Table 10: Data requirements by Wider Impacts

WI	Data requirement	Source
Agglomeration	Changes in generalised costs and demand by origin-destination pair	Railplan
	Local GDP per worker by Local Authority District (LAD)	DfT Wider Impacts Dataset
	Sectoral Employment Forecasts by LAD (Construction, Manufacturing, Consumer services and Producer services)	
	Agglomeration parameters by industrial sector	
Imperfect Competition	Changes in generalised costs and demand by origin-destination pair	Railplan
Labour Supply Impacts	Average workplace earnings, average National GDP per worker and index of productivity per worker by LAD	DfT Wider Impacts Dataset
	Labour supply impacts parameters	

Assumptions and scheme costs

Train Assumptions

7.37. Table 11 describes the differences in train service patterns between the Do Minimum and the Old Oak new Overground stations (Do Something) scenarios.

7.38. Note that train services are expected to be identical for the 'both station' scenario and for individual station scenarios. Only changes to services on the WLL are planned as part of the scheme; there will be no change to services on the NLL between Richmond and Stratford. All services which call at one of the new stations have additional journey time added to reflect the time taken to brake, call at the new station and accelerate away from the station.

Table 11: Train service patterns for Do Minimum and Old Oak new Overground stations scenarios

	West London Line	West London Line shuttle	North London Line
Do Minimum	Services operate between Clapham Junction and Stratford	Services operate between Clapham Junction and Shepherds Bush	Service operate between Richmond and Stratford
DS1 - OOC new Overground stations (both opening in 2026)	Services operate between Clapham Junction and Stratford with the addition of a station call at Hythe Road	Services operate between Clapham Junction and Hythe Road (extended from Shepherds Bush)	Services operate between Richmond and Stratford with the addition of a station call at Old Oak Common Lane
DS2 – Hythe Road Only (opening in 2026)	Services operate between Clapham Junction and Stratford with the addition of a station call at Hythe Road	Services operate between Clapham Junction and Hythe Road (extended from Shepherds Bush)	Service operate between Richmond and Stratford
DS3 – Old Oak Common Lane Only (opening in 2026)	Services operate between Clapham Junction and Stratford	Services operate between Clapham Junction and Shepherds Bush	Services operate between Richmond and Stratford with the addition of a station call at Old Oak Common Lane

7.39. The changes to the train service frequencies (compared to the Do Minimum) that have been assumed are shown in Table 12.

Table 12: Train service frequencies (single direction only) for Do Minimum and Old Oak new Overground stations scenarios

Service	Do Minimum frequency (tph)		Old Oak new Overground stations frequency (tph)	
	Morning peak	Interpeak	Morning peak	Interpeak
Richmond – Stratford	5	4	5	4
Clapham Junction – Stratford	5	4	5	4
Watford Junction – Clapham Junction	1	0	1	0
Milton Keynes – South Croydon	1	1	1	1
Shepherds Bush – Clapham Junction	2	0	0	0
Hythe Road – Clapham Junction	0	0	2	0
Total (serving Hythe Road station)	**0**	**0**	**7**	**4**
Total (serving Old Oak Common Lane station)	**0**	**0**	**5**	**4**

7.40. Some further network assumptions are as follows:

i. All Overground services are 5 car trains and all Southern services can be up to 8 cars in length;

ii. To accommodate the additional stops at the new stations existing journey times from Acton Central to Willesden Junction and Shepherds Bush to Willesden Junction have been extended by two minutes;

iii. Walk distances between the Overground, HS2, the Elizabeth line and National rail platforms are as calculated and provided by scheme layout drawings from the previous GRIP 2 study (the HS2/Elizabeth line/National rail station design as well as the streetscape around the station are both still under development);

iv. A new pedestrian link is created between Old Oak Common Lane and Victoria Road, also connecting to the HS2/Elizabeth line/National rail station at Old Oak Common;

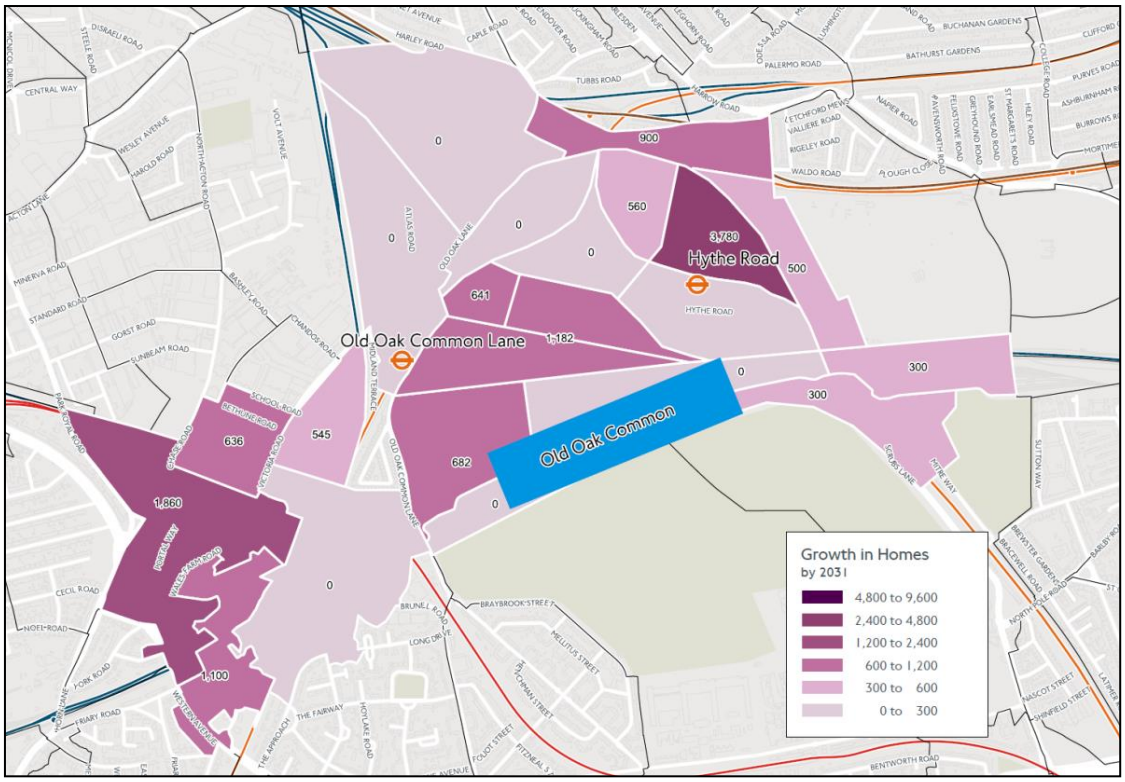
v. Pedestrian links have been provided between the new Overground stations and the HS2 concourse; and

vi. Additional performance benefits have not been quantified.

7.41. The Development Demand growth scenario adopts the 2015 Old Oak and Park Royal OAPF population and employment projections[22]. 22,500 homes and 63,710 jobs are forecast for the area by 2041 with two thirds of these being constructed on the HS2 and railway depot sites in close proximity to the planned Old Oak Common station. The development is assumed to start in 2026 and be fully completed by 2041.

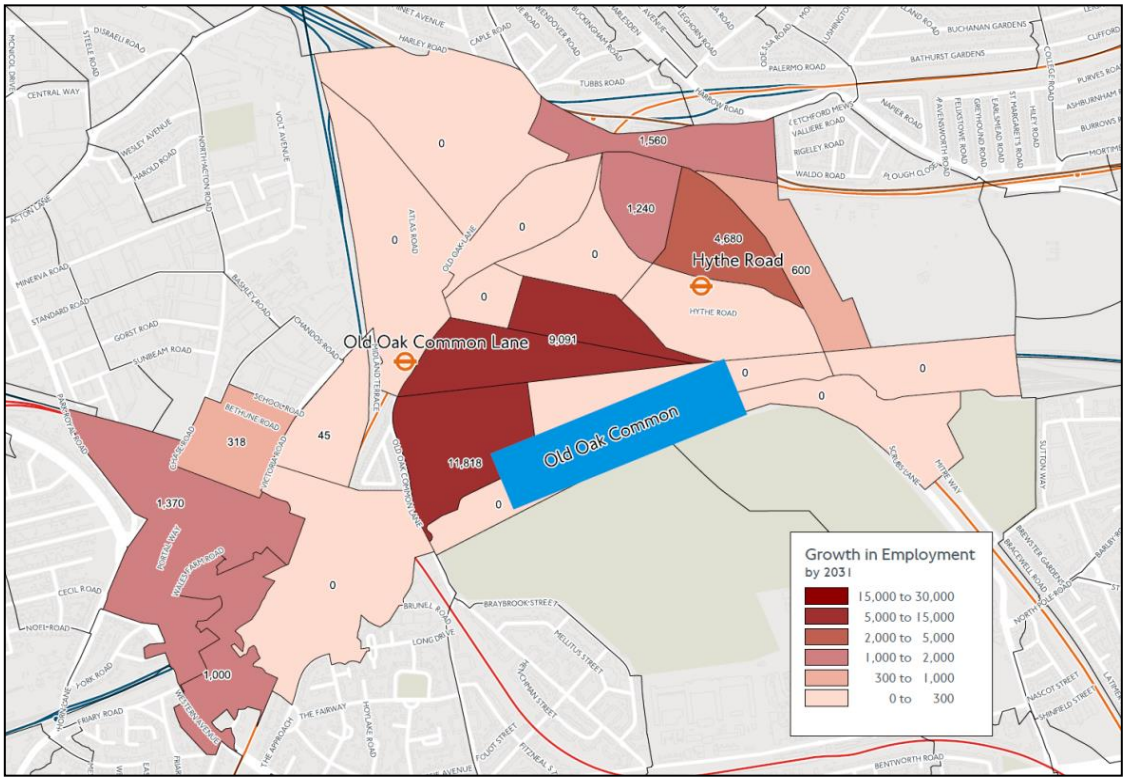
7.42. Figure 15 and Figure 16 show the distributions of additional homes and jobs over and above the London Plan assumptions in 2031 that have been adopted in the model. The growth has been allocated to the zones in TfL's Railplan model, which has been used to assess the impact of the new stations on public transport demand. In total, there are 13,000 additional homes and 34,000 additional jobs in the local area.

Figure 15: Additional growth in housing by 2031 at Old Oak over and above London Plan



[22] At the point of starting the modelling work, the OPDC Development Capacity Study (DCS) was not ready and the 2015 OAPF development assumptions were the best available. A sensitivity test using the latest DCS demand assumptions have been carried out which shows that the impact is marginal.

Figure 16: Additional growth in jobs by 2031 at Old Oak over and above London Plan



7.43. Figure 17 and Figure 18 show the distributions of additional homes and jobs over and above the London Plan assumptions in 2041. This includes the full level of development at Old Oak (22,500 homes and 63,710 jobs as outlined in the OAPF), as well as the full impact of HS2 Phase 2. Both the additional development and HS2 Phase 2 will result in more passenger demand in the Old Oak area.

Figure 17: Additional growth in housing by 2041 at Old Oak over and above London Plan

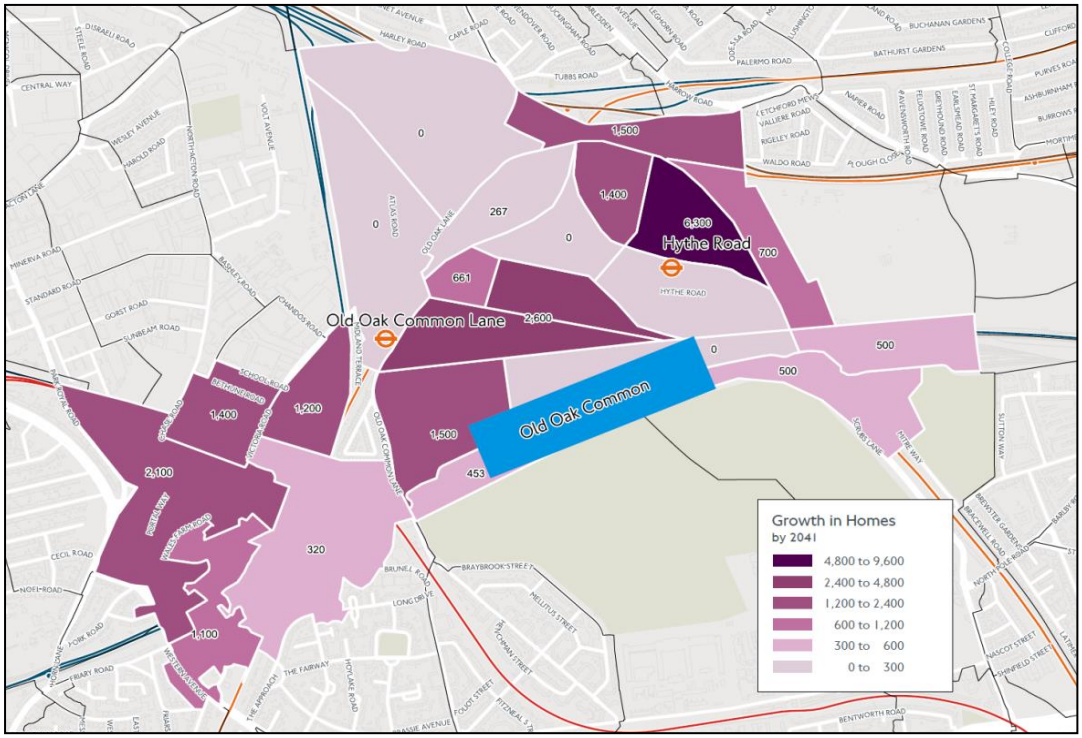
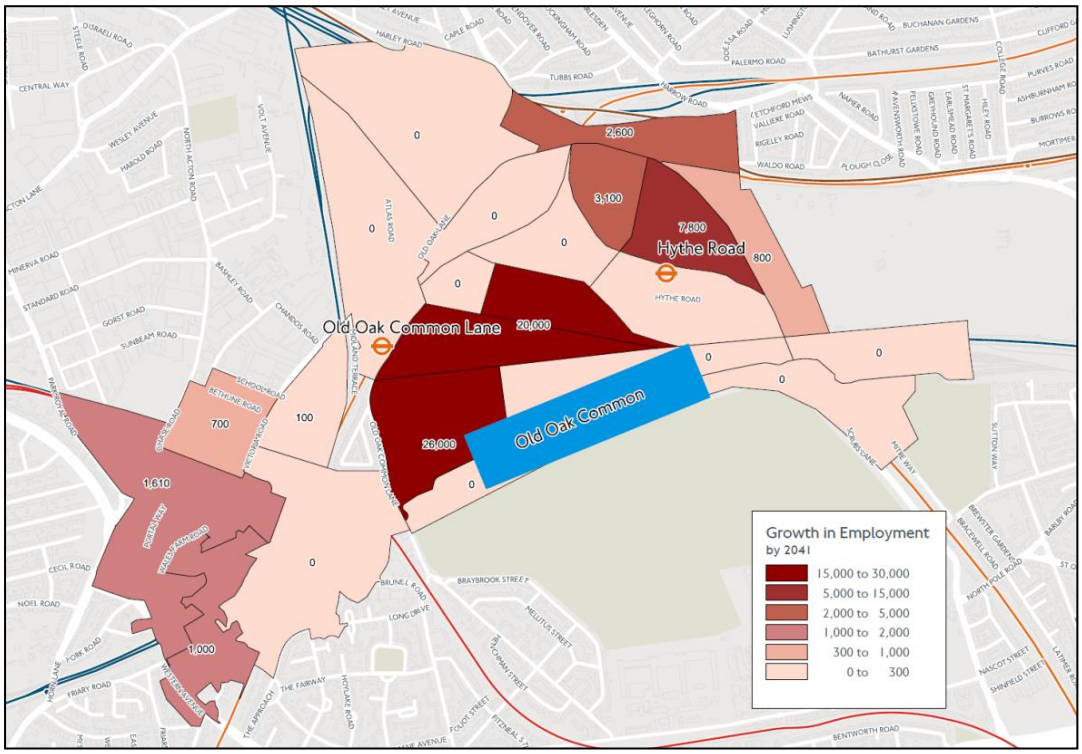


Figure 18: Additional growth in jobs by 2041 at Old Oak over and above London Plan



7.44. The 2026, 2031 and 2041 model networks include schemes that have been introduced since the 2011 model base year or are committed for delivery through to 2031. In the case of 2041 no additional schemes to those delivered by 2031 are believed to exist and the network assumptions are the same. Committed schemes across London are included, but some of those most relevant to the Old Oak area are as follows:

i. lengthening of London Overground services to five cars;
ii. introduction of the Elizabeth line services including a station at Old Oak Common;
iii. introduction of HS2 including a station at Old Oak Common;
iv. new GWML platforms at Old Oak Common with a station call on some services; and
v. upgrades to LU lines passing close to the Old Oak site.

7.45. Some further assumptions used in the modelling and preparation of the business case are listed in more detail below:

i. The economic appraisal is presented in 2010 prices.
ii. The new stations are assumed to open in 2026 as the core scenario, with different phased opening years as sensitivities.
iii. Benefits are based on Railplan results from the morning peak and interpeak periods, annualised to a full year.
iv. Validation of the Railplan model has been undertaken as part of the Overground Capacity Study which provides a satisfactory representation of demand on the NLL and WLL.
v. Annualisation factors of 607 for the morning peak period and 620 for the interpeak period have been used, based on analysis of LU observed data.
vi. The impact of HS2 has been included in this assessment for all scenarios. The 2026 and 2031 networks include service and network coding for HS2 Phase 1 which provides a high speed service between London and the West Midlands with a stop at Old Oak Common. 10 trains per hour will call at Old Oak Common in the AM Peak Period. The 2041 Do Minimum network includes Phase 2 of HS2 where the route is extended from Birmingham creating a Y-network to Leeds and Manchester. 16 trains per hour will call at Old Oak Common in the AM Peak Period.
vii. No benefits or disbenefits from station congestion impacts have been captured in this assessment.
viii. Boarding penalties for Overground services at Old Oak Common are as per National rail penalties (7 minutes).
ix. Benefits are based on 2026, 2031 and 2041 modelled scenarios (interpolated between modelled years).

x. Rail demand is assumed to remain constant beyond 2041.
xi. No disbenefits have been assumed during construction.
xii. The assessment has been appraised over a 60-year period, between 2026 and 2085.

7.46. The full record of modelling assumptions is captured in Chapter 4 and Appendix C9 of the Overground Old Oak Common Station Modelling and Business Case Assessment report[23].

Scheme costs

7.47. For all three scenarios assessed in this economic case, the station costs are based on the Grip 3B design (viaduct in the north for Hythe Road and overbridge for Old Oak Common Lane) estimates provided by London Overground and their consultants Arcadis.

7.48. Even though all costs estimates have been developed to a GRIP3[24] level of detail, as the overall project is still at the Strategic Outline Business Case stage, the benefit values are considered at GRIP Level 2 (Pre-Feasibility). For this reason, In line with WebTAG guidance for projects at GRIP Level 2, optimism bias has been applied at 64% for capital costs (excluding risk and contingency) and 1.6% for operating costs (Source: WebTAG A5.3, Table 3, July 2017). As the project proceeds through the GRIP development process the level of optimism bias will be reduced.

Capital costs

7.49. The capital costs for each station are set out in Table 13 in Q3 2016 prices. Capital cost expenditure on new station infrastructure is expected to total £85.85m for Old Oak Common Lane and £110.47m for Hythe Road (excluding inflation). If both stations were delivered in combination the total cost is £196.32m (two stations summed). For the purposes of this appraisal it has been assumed that costs are incurred in the year prior to opening e.g. 2025. The costs are sourced from the 2017 Arcadis study[25] of the new stations and exclude risk and contingency or optimism bias.

[23] TfL (2017), Overground Old Oak Common Station Modelling and Business Case Assessment report
[24] Governance for Railway Investment Process. Eight stage process with Stage 2 being Feasibility Stage.
[25] Old Oak Common Overground stations GRIP3, Quantified Proposal Estimate, 2017.

Table 13: Capital Cost Estimate (£m, Q3 2016 prices)

Element	Hythe Road	Old Oak Common Lane	Both Stations
Railway Control Systems	4.45	3.76	8.21
Train Power Systems	2.61	2.58	5.19
Electrical Power and Plant	0.43	0.27	0.70
Permanent Way	3.10	2.96	6.06
Operational Telecommunication Systems	0.73	0.82	1.55
Buildings and Property	11.15	10.64	21.79
Civil Engineering	28.93	10.07	39.00
Enabling Works	0.95	5.62	6.57
Direct Construction Works	*52.36*	*36.71*	*89.07*
Preliminaries	13.46	10.27	23.72
Overheads and Profit	8.56	6.11	14.66
Indirect Construction Works	22.01	16.37	38.39
Design Team Fees	7.44	5.31	12.75
Project Management Fees	16.23	13.00	29.23
Other Project Costs (including Possessions)	12.43	14.46	26.89
Employers Indirect Costs	36.10	32.77	68.87
Total	**110.47**	**85.85**	**196.32**

7.50. Land acquisition would be required for each station and has been costed by a TfL Operational Property Assessment (2014). This has been estimated to be (values below are in 2016 prices and without inflation):

i. Old Oak Common Lane: £6.2m
ii. Hythe Road: £28.33m

7.51. The scheme appraisals have been undertaken in 2010 prices. Costs have been converted to 2010 prices using a GDP deflator from the Office of Budget Responsibility (Table 3.5, January 2017 Fiscal Sustainability Report Charts and Tables).

Operating costs

7.52. The operating cost estimates have been produced for the extension of the Southern services from Shepherds Bush to Hythe Road and for the operation of the new stations themselves. From the station design work undertaken by Arcadis it has been identified that costs are required to support the following:

i. Station staff: four staff at Old Oak Common Lane and four at Hythe Road. No ticket office assumed only gateline staff. Assume 8 hour shifts and cover for training, sickness and leave.
ii. Train drivers: 4 extra drivers for Southern service extension. Assume 8 hour shifts and cover for training, sickness and leave.
iii. Lifts: Four at Old Oak Common Lane and two at Hythe Road
iv. Ticket Vending Machines (TVM): two at Old Oak Common Lane and three at Hythe Road

7.53. Table 14 sets out the breakdown of the operating costs by element and year at 2016 prices. Operating costs are assumed to start being incurred from 2026 when the new stations are assumed to open with the exception of Staff Recruitment and Training costs which are in the year prior to opening.

7.54. Operating Costs are indexed using a GDP deflator from the Office of Budget Responsibility (Table 3.5, January 2017 Fiscal Sustainability Report Charts and Tables). Unit costs for the assessment have been sourced from historic Overground costs or the SDG/Systra South East London Metro Study (March 2016).

7.55. For Hythe Road station, in addition to the operating costs explained above, the proposed extension of the Southern service is expected to result in an additional rolling stock requirement of one train of 8 carriage length.

7.56. s part of the scheme proposal it is proposed to extend the peak Southern services that terminate at Shepherds Bush to Hythe Road. Additional rolling stock is assumed to be leased and therefore a lease charge has been assumed throughout the appraisal.

7.57. Where rolling stock requires replacement in the 60 year appraisal period it is assumed that a replacement can be procured at the same cost.

Table 14: Operating Cost Estimate per annum (£m, 2016 prices)

Cost Element	Old Oak Common Lane	Hythe Road	Assumption
Stations			
Station Staffing	£0.2m	£0.2m	£50k per staff member
Staff Recruitment and Training	£0.05m	£0.05m	3 months training at £15k per person. £10k for recruitment.
Lift Maintenance	£0.04m	£0.02m	£10k per lift per annum
Ticket Vending Machine Maintenance	£0.02m	£0.03m	Average from historic cost
Gateline Maintenance	£0.003m	£0.003m	CUBIC Estimate
General Station Maintenance e.g. cleaning	£0.05m	£0.05m	Estimate
Sub Total	**£0.363m**	**£0.353m**	
Southern Train Service Extension			
Variable Track Access Charge (VTAC)	-	£0.008m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.057 per vehicle km.
Capacity Charge	-	£0.028m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.186 per vehicle km.
Electrification Asset Use Charge	-	£0.0012m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.008 per vehicle km.
Electricity Charges for Traction (EC4T)	-	£0.066m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.432 per vehicle km.
Train Driver Staffing	-	£0.22m	£55k per staff member
Train Driver Recruitment and Training	-	£0.19m	10 months training at £45k per person. £10k for recruitment.
Rolling Stock Lease for an 8car train	-	£1.10m	£138k per train vehicle. One train of 8 vehicles.
Rolling Stock Maintenance and Cleaning		£0.124m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.80 per vehicle km.
Sub Total	**-**	**£1.74m**	

Asset renewal costs

7.58. Renewal costs have been assumed for new assets that have a finite life and that do not already exist on the network. These relate to the addition of a junction and track for a reversing siding at Hythe Road station and lift replacement at both stations. Some assets added by the project are replacements for those already in existence and in this case it is assumed that Network rail is already funded to maintain these assets and no further renewal cost is included. Cost estimates and their frequency of replacement have been developed by Arcadis (June 2017) as shown in Table 15 below.

Table 15: Asset Renewal Cost Estimate (£m, 2016 prices)

Asset	Renewal Frequency	Old Oak Common Lane	Hythe Road
LED Signal and Indicator	Every 10 years	-	£0.144m
Train Detection and Protection Systems	Every 10 years	-	£0.175m
Slab Track Renewal	Every 35 years	-	£0.21m
Ballast Track Renewal	Every 40 years	-	£0.18m
Points Renewal	Every 20 years	-	£0.57m
Lifts Renewals	Every 25 years	£1.81m	£0.91m

7.59. Finally, a series of assumptions have been made with regard to scheme costs which are set out below:

i. capital costs are assumed to be spent over a three-year period, 2023-2025;
ii. new public transport revenues have been captured in the appraisal by applying an average yield per kilometre to the change in passenger kilometres calculated by Railplan.

Public transport modelling outputs

Station demand

7.60. Table 16 shows the demand forecast under the Development Demand growth scenario for 2026, 2031 and 2041 modelled years. The demand forecasts suggest that if both Overground stations were open in 2026, Old Oak Common Lane would see an annual passenger demand of 2.1 million in 2026, rising to 3.3 million passengers per annum by 2041. Hythe Road would see an annual passenger demand of 2.4 million in 2026 rising to 4.1 million per annum by 2041. The station usage figures for 2041 for Hythe Road would be similar in terms of passenger numbers to Sydenham station today and Old Oak Common Lane to Imperial Wharf.

7.61. There appears to be only a slight difference in individual station demand when the stations are delivered in isolation or combination. The difference is about 0.1 million passengers per annum. This indicates that there is relatively little in common between the two stations in terms of catchment area or destinations.

Table 16: Passenger demand assessment – new Overground stations

Annual Station Demand (millions)	DS1: Hythe Road	DS1: Old Oak Common Lane	DS2: Hythe Road Only	DS3: Old Oak Common Lane Only
2026	2.4	2.1	2.2	2.1
2031	3.6	2.4	3.7	2.5
2041	4.1	3.3	4.1	3.4

7.62. The impact of the new stations on the other key stations in the Old Oak area is shown in Table 17.

Table 17: 2041 passenger demand assessment – impact of new Overground stations on Old Oak station demand

Annual Station Demand (millions)	Old Oak Common: Elizabeth Line	Old Oak Common: Great Western	Old Oak Common: HS2	Willesden Junction	North Acton	Kensal Green
Reference Case	71.4	25.4	33.6	16.0	6.2	4.6
DS1: Both Stations	69.7	25.5	34.1	14.1	5.8	4.5

7.63. The new Old Oak Common HS2/Elizabeth line/National rail station is going to be very busy with 95 million passengers either interchanging between trains or entering/exiting the station per annum in 2041 when the Old Oak development is completed. This station complex will then be similar in size to Waterloo today in terms of National rail entries and exits. The HS2 station will add a further 34 million passengers per annum to those forecast to be using the Old Oak Common station complex.

7.64. The new Overground stations will offer some capacity relief to both Willesden Junction and North Acton. The impact of the Old Oak development would increase the passenger demand to 16 million in 2041. The introduction of both Overground stations would reduce this to 14.1 million per annum, with 1.9 million fewer passengers per annum using Willesden Junction station. The majority of the passengers will switch to use the new Hythe Road station.

7.65. Passenger demand at North Acton is forecast to increase by 26 per cent from 4.5 million passengers per annum in 2021 to 5.7 million in 2041. The Old Oak development is expected to further increase this by 0.5 million passengers per annum to 6.2 million. The impact of the Overground stations and in particular Old Oak Common Lane is to reduce the demand by 0.5 million passengers per annum potentially saving mitigation measures for 10 years of demand growth. Kensal Green will also benefit from the new Overground stations, showing a reduction of 0.1m or 2 per cent fewer passengers per annum in 2041 with both new Overground stations in place.

7.66. The impact of the new stations on the other key LU and National rail stations outside the Old Oak area is shown in Table 18.

Table 18:2041 passenger demand assessment – impact of new Overground stations on station demand outside the Old Oak area

Annual Station Demand (millions)	West Brompton	Clapham Junction	Shepherds Bush	Richmond	Ealing Broadway	Paddington	Euston
Reference Case	17.8	151.3	36.1	31.0	50.4	180.1	264.9
DS1: Both Stations	19.0	152.2	35.3	32.5	49.3	178.7	264.1

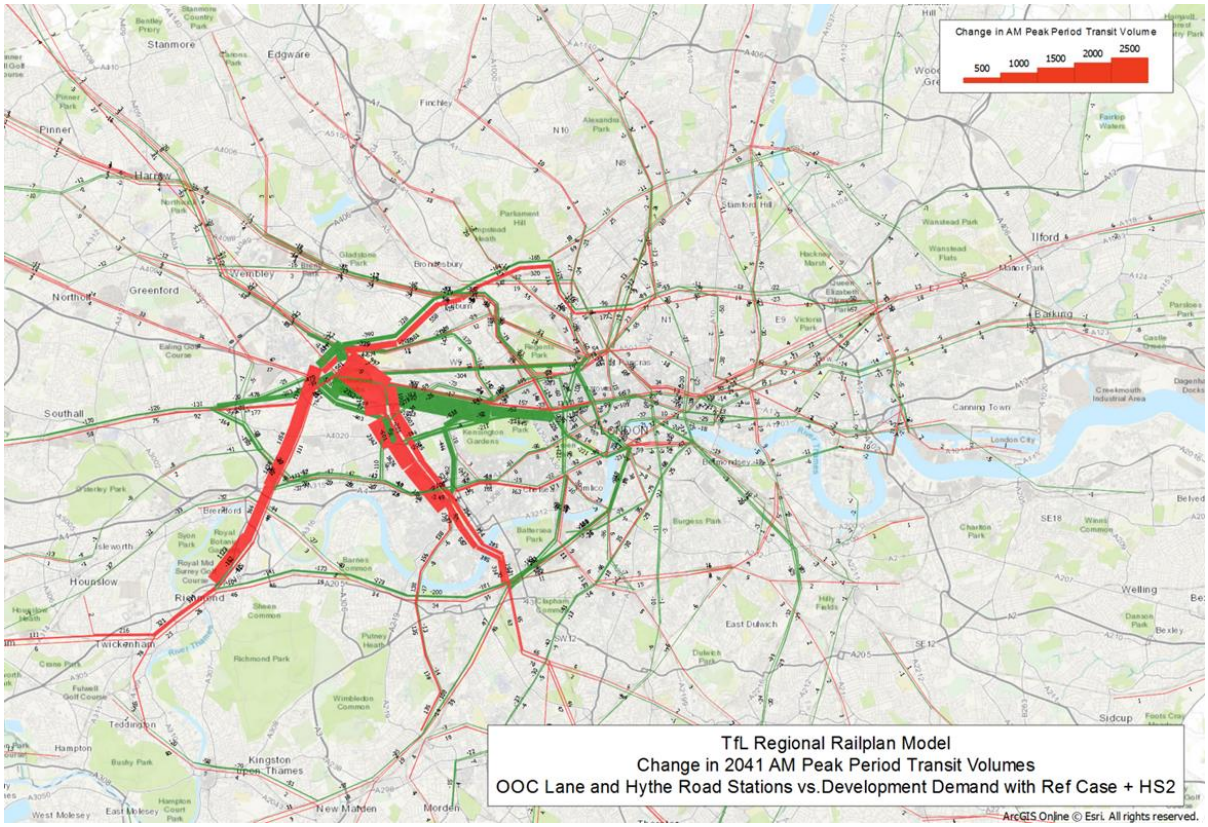
7.67. Table 18 shows the new Overground stations will help to relieve station congestions in a number of key stations in London, notably at Paddington and Euston. The addition of the Old Oak Common station and calls for Great Western and Elizabeth line services has a significant impact on interchange volumes at Paddington reducing them by 20 per cent. The overall station demand would go down by 1.4 million or 1 per cent per annum due to the potential new Overground stations. At Euston station, By 2041 HS2 has a significant impact adding 70 million passengers per annum. The congestion relief as a result of the new Overground stations are small, having 0.8 million fewer passengers or less than 1 per cent per annum use Euston with both potential new Overground stations in place.

7.68. Stations not within the Old Oak area but within close proximity of the new Overground stations will also benefit, for instance, Ealing Broadway and Shepherds Bush are both showing a reduction in station demand in 2041.

Network impacts

7.69. Figure 19 shows the overall forecast change in demand in the 2041 morning peak period resulting from the opening of both Overground stations on the network. Increases in demand are represented by red links whereas reductions in demand are represented by green links.

Figure 19: Change in 2041 morning peak period demand resulting from both new Overground stations

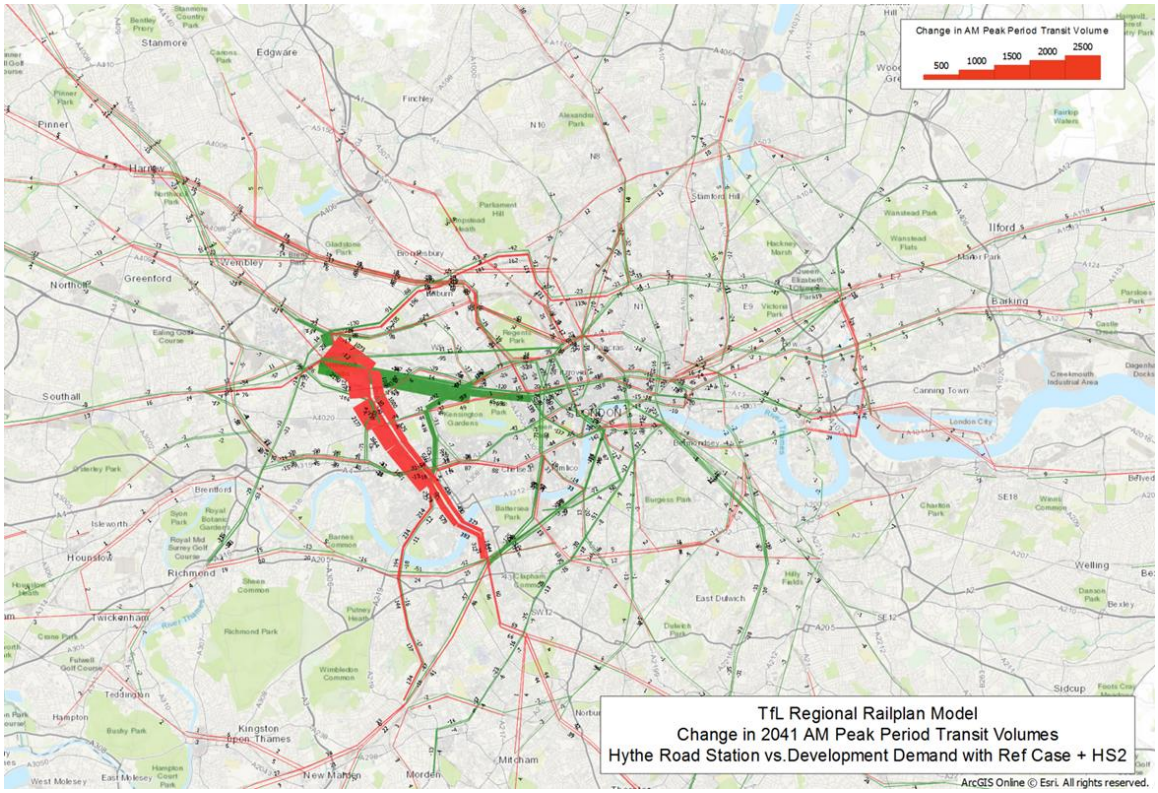


7.70. Figure 19 clearly shows a substantial increase in passenger demand on the WLL between Clapham Junction and Willesden Junction and a smaller increase on the NLL between Richmond and Willesden Junction. There is also a smaller amount of increase on the NLL westbound from Gospel Oak to Willesden Junction; the South West Train services on the Reading corridor to Richmond and the District line services between Wimbledon and West Brompton.

7.71. A substantial reduction in demand between Old Oak and central London can be seen on HS2, the Elizabeth line services and the Central Line, caused by passengers using the London Overground network to avoid travelling via central London as a result of the new Overground stations being available. There is also a reduction on the NLL between Willesden Junction and Gospel Oak, and on the District line services serving Ealing Broadway and Bond Street, West Brompton and Paddington. A reduction can also be seen on the South West Train services between Clapham Junction and Waterloo as well as on the Southern services between Clapham Junction and Victoria. There is also a reduction on the Victoria line towards Euston.

7.72. Figure 20 shows the overall forecast change in demand in the 2041 morning peak period resulting from the opening of Hythe Road Overground station on the WLL.

Figure 20: Change in 2041 morning peak period demand resulting from opening Hythe Road Only

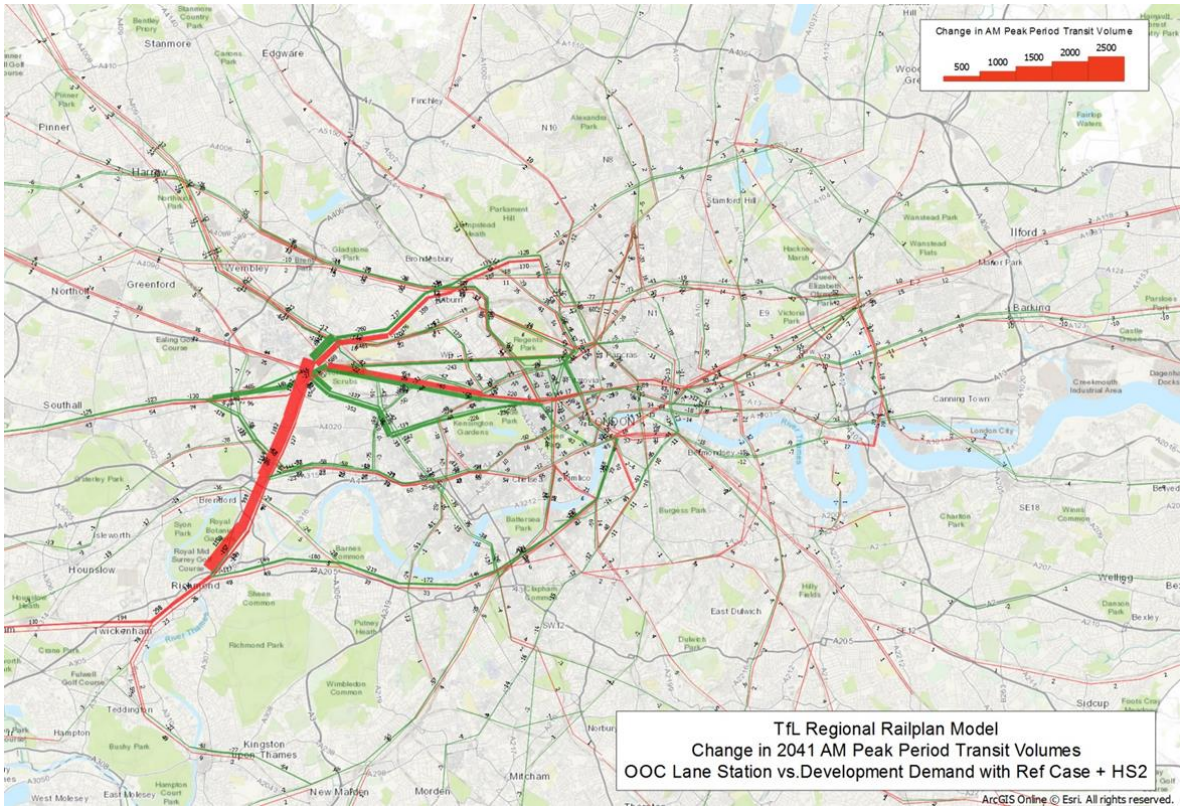


7.73. Figure 20 shows a substantial increase in passenger demand on the WLL in both directions between Clapham Junction and Willesden Junction. There is a small amount of increase on the NLL westbound from Gospel Oak to Willesden Junction as well as on the District line services between Wimbledon and West Brompton.

7.74. The reduction in demand between Old Oak and central London is less substantial than the 'both stations' scenario. The highest reduction is on the Elizabeth line services between Old Oak and Paddington and the Central line services towards central London. The reduction is also seen on the NLL between Willesden Junction and Gospel Oak, the District line services between West Brompton and Paddington, the South West Train services between Clapham Junction and Waterloo, as well as the Southern services between Clapham Junction and Victoria and the Victoria line services towards Euston.

7.75. Figure 21 shows the overall forecast change in demand in the 2041 morning peak period resulting from the opening of Old Oak Common Lane Overground station on the NLL. Increases in demand are represented by red links whereas reductions in demand are represented by green links.

Figure 21: Change in 2041 morning peak period demand resulting from opening Old Oak Common Lane Only



7.76. Figure 21 shows an increase in passenger demand on the NLL in both directions between Richmond and Willesden Junction and also on the NLL westbound between Gospel Oak and Willesden Junction. There is also a small amount of increase on the Elizabeth Line services to central London and the South West Train services on the Reading corridor to Richmond.

7.77. A smaller reduction in demand compared to the other two scenarios are experienced on the Central line between Ealing Broadway and central London; on the NLL between Willesden Junction and Gospel Oak; the District line services between Ealing Broadway and Hammersmith as well as the South West Train services between Richmond and Waterloo.

Crowding impacts

7.78. The addition of the new Overground stations and the impact of the development demand will lead to increases in on-train loadings. In addition there is the impact of underlying growth and demand drivers elsewhere on the Overground network. Passengers may have to stand when previously seats were available or they may need to stand in more crowded conditions than before. It is important to understand what the drivers are of increased crowding and when or if additional capacity beyond that already provided on the Overground network is required, and this can help to inform potential funding discussions.

An assessment of on-train crowding has also been undertaken. The route with the most significant crowding issues that serves the new Overground stations is the WLL

7.79. Figure 22 and Figure 23 present the forecast crowding levels on WLL services in the 2041 morning peak period for eastbound and westbound directions respectively.

7.80. Figure 22 and Figure 23 show a change in demand over time from 2021 through to 2041 illustrating the impact of development growth and service changes. The colours represent the following scenarios:

i. 2021 London Plan growth scenario;
ii. 2031 Development Demand growth scenario plus the Old Oak Common HS2/Elizabeth line/National rail station;
iii. 2041 Development Demand growth scenario plus the Old Oak Common HS2/Elizabeth line/National rail station;
iv. 2031 and 2041 Development Demand growth scenario plus the Old Oak Common HS2/Elizabeth line/National rail station plus both Hythe Road and Old Oak Common Lane stations.

7.81. Analysis of the forecast station demand has shown that the impacts of both stations are similar to each individual station and therefore only graphs showing the combination of stations have been produced. The on-train loading assessment assumes the committed Overground '5+5' timetable.

Figure 22: Change in Average AM Peak Hour on Train Loadings, Eastbound from 2021 to 2041 plus with both Overground Stations

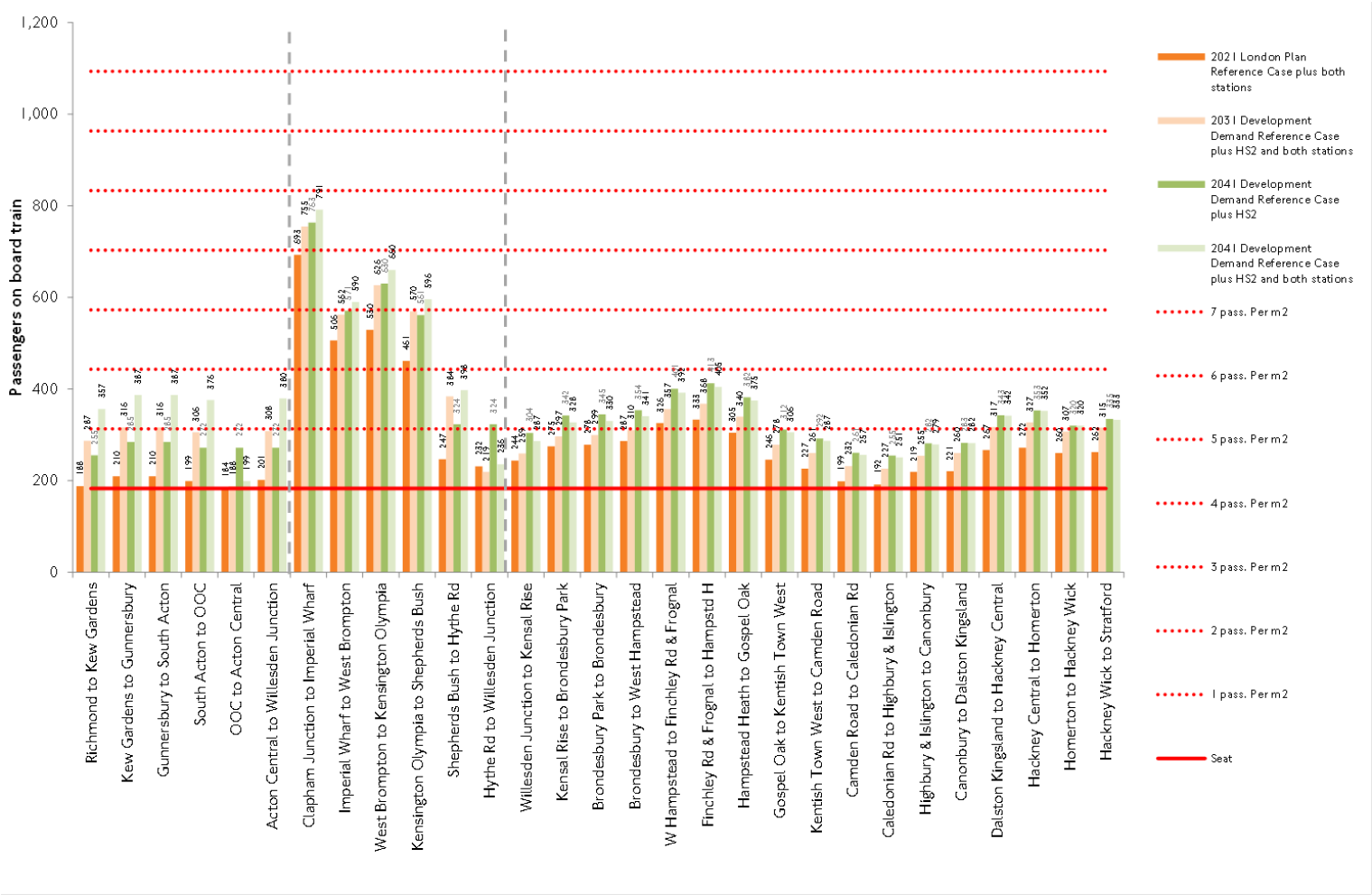
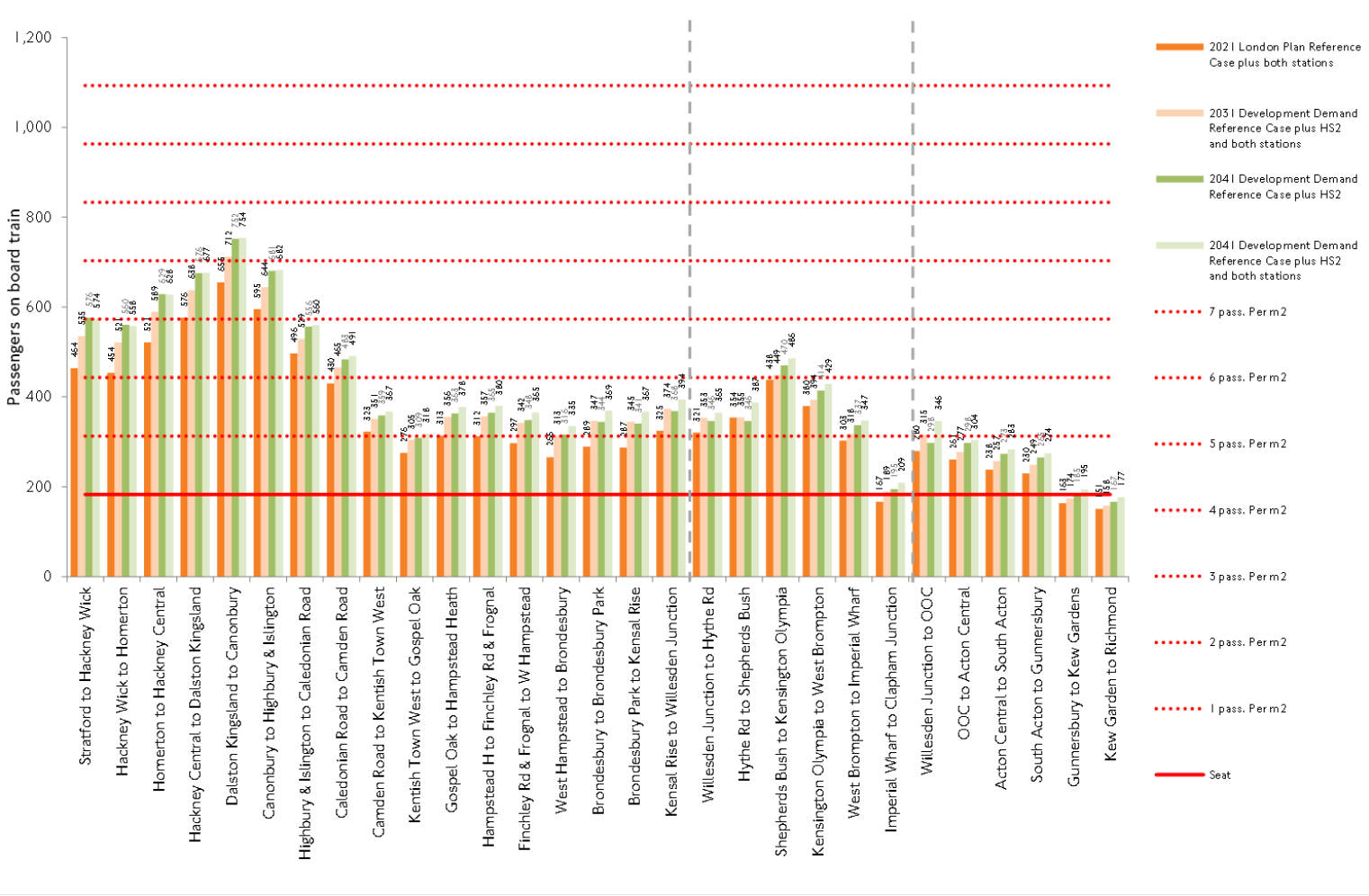


Figure 23: Change in Average AM Peak Hour on Train Loadings, Westbound from 2021 to 2041 plus with both Overground Stations



7.82. Figure 22Figure 22 and Figure 23 show that the busiest loading point on the NLL in the average AM peak hour is upon departure from Clapham Junction towards Willesden Junction. In 2021 the average on train load is around 700 passengers which equates to a train with up to 4 passengers standing per metre of standing space. The impact of underlying demand growth and the Old Oak development through to 2041 is to increase the number of passengers standing to around 4.5 per metre of standing space. The impact of the new Overground stations is then to increase this further by another 0.5 passenger per metre of standing space. This impact can be observed on all links between Clapham Junction and Hythe Road, although there is a notable reduction in crowding at Shepherds Bush as passengers alight for the Westfield Shopping Centre. Beyond Willesden Junction towards Stratford the impact of the new stations upon change in on train loads and crowding disappears reflecting the fact average trip lengths are short of around 15 minutes.

7.83. On the Richmond branch crowding is lower than on the WLL, and in 2021 all passengers are expected to be able to get a seat. With the full impact of underlying growth, the Old Oak development and the new Overground stations, average AM Peak on train loads are around 375 passengers per train equating to around 1.5 passengers standing per metre of standing space.

7.84. The increase in on train loadings on the WLL between Clapham Junction and Willesden Junction due to the new Overground stations and Old Oak development will increase crowding to a point where extended dwell times would be required. The route has a high churn in demand and whilst loads may appear consistent there will be large numbers of passengers alighting and being replaced at West Brompton in particular. The average on train loadings are above the target of 3 passengers standing per metre of standings space that TfL has for its rail services in the AM Peak and it would appear that additional capacity is going to be required on the WLL to accommodate the passenger demand placed upon it. Hythe Road station is a contributory factor, as is underlying demand growth and the Old Oak development.

7.85. There does appear to be sufficient capacity to accommodate demand growth from HS2, the planned development and underlying growth on the route to Richmond to not warrant a capacity increase.

Economic appraisal results

Level 1 benefits – typically monetised transport user benefits

7.86. Table 19 summarises the overall economic appraisal of the scheme for the three scenarios regarding station opening, to provide an indication of the upper and lower boundaries of the value for money assessment of the scheme. Results are presented using both the DfT's WebTAG methodology and TfL's BCDM methodology. Note that more details on the estimate of the calculation of revenue are set out in Section 8 of this document which covers the Financial Case.

Table 19: Economic Appraisal Results (£m, PV, 2010 prices)

	DS1: Old Oak Common Lane and Hythe Road		*DS2: Hythe Road Only*		*DS3: Old Oak Common Lane Only*	
Capital Costs	*246*		*148*		*98*	
Renewals Costs	*6*		*3*		*3*	
Operating Costs	*60*		*48*		*12*	
Revenue	12		5		8	
Present Value of Costs (PVC)	**300**		**194**		**105**	
	TfL VoT	DfT VoT	TfL VoT	DfT VoT	TfL VoT	DfT VoT
Time Savings	*479*	*426*	*194*	*173*	*294*	*261*
Road Decongestion	*21*	*21*	*8*	*8*	*12*	*12*
Accident Savings	*3*	*3*	*1*	*1*	*2*	*2*
Emissions Benefits	*1*	*1*	*1*	*1*	*1*	*1*
Local Air Quality	0	0	0	0	0	0
Noise	0	0	0	0	0	0
Indirect Taxation Loss	*8*	*8*	*3*	*3*	*5*	*5*
Present Value of Benefits (PVB)	**496**	**444**	**201**	**180**	**304**	**271**
Net Present Value (NPV)	**196**	**144**	**7**	**-14**	**199**	**166**
Initial Benefit Cost Ratio (BCR)	*1.7 to 1*	*1.5 to 1*	*1.1 to 1*	*0.9 to 1*	*3 to 1*	*2.7 to 1*
Value for Money Category	***Medium***	***Medium***	***Low***	***Poor***	***High***	***High***

7.87. The benefits included in Table 19 are purely transport user benefits based on changes in demand, travel time and crowding. Over the 60-year appraisal period, the project is estimated to result in an overall Present Value of Benefits of £496 million (2010 prices) leading to a Benefit Cost Ratio (BCR) of 1.5 to 1. Using TfL's methodology the BCR increases to 1.7 to 1. This demonstrates that the scheme offers 'Medium Value for Money' based on transport benefits alone regardless of the methodology used and with any of the option combinations.

7.88. Work to date indicates that there would be no case for providing the two new stations or to providing Hythe Road station only without the level of development set out in the OPDC OAPF, i.e. the scheme would be of 'Poor Value for Money'. However, there would still be a good case for Old Oak Common Lane station, showing a BCR of 2.3 to 1 without the OPDC planned developments.

Level 2 benefits – Wider Economic Impacts

7.89. The Wider Economic Impacts resulting from each of the Overground station under the development demand scenario are set out in Table 20, Table 21 and Table 22 below. The addition of Level 2 benefits brings a moderate increase in BCR in each case. With HS2, the Elizabeth line and Old Oak and Park Royal development assumed to be in place, the inclusion of Level 2 benefits takes the BCR for both stations combined to 'High Value for Money' category while the value for money category stay unchanged for the individual station cases.

Table 20: Wider Economic Impacts Results (2041 single year benefits, £m, PV, 2010 prices)

	DS1: Old Oak Common Lane and Hythe Road	*DS2: Hythe Road Only*	*DS3: Old Oak Common Lane Only*
Agglomeration	3.5	1.6	1
Output change	2.5	1.0	1.6
Labour supply	2.3	1.5	0.8
Total	8.3	4.1	3.4

Table 21: Wider Economic Impacts Results (60 year benefits, £m, PV, 2010 prices)

	DS1: Old Oak Common Lane and Hythe Road	*DS2: Hythe Road Only*	*DS3: Old Oak Common Lane Only*
Total Wider Economic Impacts	152	76	66

Table 22: BCR including WEIs (£m, PV, 2010 prices)

	DS1: Old Oak Common Lane and Hythe Road		*DS2: Hythe Road Only*		*DS3: Old Oak Common Lane Only*	
Present Value of Costs (PVC)	300		194		105	
	TfL VoT	DfT VoT	TfL VoT	DfT VoT	TfL VoT	DfT VoT
Initial Present Value of Benefits (PVB)	496	444	201	180	304	271
Initial Net Present Value (NPV)	196	144	7	-14	199	166
Initial Benefit Cost Ratio (BCR)	*1.7 to 1*	*1.5 to 1*	*1.1 to 1*	*0.9 to 1*	*3 to 1*	*2.7 to 1*
Wider Economic Impacts	*152*	*152*	*76*	*76*	*66*	*66*
Adjusted Present Value of Benefits (PVB)	648	596	277	256	370	337
Adjusted Net Present Value (NPV)	348	296	83	62	265	232
Adjusted Benefit Cost Ratio (BCR)	*2.2 to 1*	*2.0 to 1*	*1.4 to 1*	*1.3 to 1*	*3.5 to 1*	*3.2 to 1*
Value for Money Category	*High*	*High*	*Low*	*Low*	*High*	*High*

7.90. During the process of calculating the WEI's for this study a number of limiting constraints were identified that should be considered when examining the wider benefits. Firstly, the DfT Wider Impacts Dataset includes data at a borough level which does not include the changes resulting from the Old Oak development. Examples include the wage assumptions and GDP per worker, which reflect the current make-up of the area as opposed to the future.

7.91. The connectivity of the area delivered by the new Old Oak Common HS2/Elizabeth line/National rail station is such that the area will attract higher value jobs similar to say an area like Canary Wharf or the City of London.

7.92. As a result some of the wider economic benefits could be considered an underestimate.

Level 3 benefits – Move to More Productive Jobs and Dependent Development

7.93. As the Old Oak area is forecast to be a commercial hub with excellent connectivity, by enabling even a small increase in the amount of employment and housing development possible at the site, the Overground stations have the potential to bring significant Level 3 Wider Impacts by:

i. Enabling more jobs to be located in a dense, well connected employment hub which matches the needs of the ongoing trend of concentration of office space in central, well connected locations. Agglomeration effects associated with the density of the location and its connection to the CAZ and other Opportunity Areas should mean that these jobs have above average productivity and therefore increased employment in the area should raise the productivity of London; and
ii. Enabling more housing units to be built in a very constrained market, in a well-connected location that is likely to be considered desirable; as long as traffic impacts and other externalities can be minimised and the quality of the new environment maximised to ensure promote high land values.

7.94. High level estimates of potential scale of both of these impacts have been conducted by Atkins[26]. The estimates suggest that both benefits have the potential to be significant and to considerably strengthen the Economic Case for the scheme in the right circumstances.

7.95. However, it is important to note that, in the absence of economic modelling, the estimates have necessarily been built on a large number of assumptions, for instance around scale of employment, alternative locations, productivity in each location and potential land value.

[26] Atkins (2017) Old Oak Common Overground Stations Wider Economic Impact Report

7.96. For this reason, the ranges shown are large, highlighting the sensitivity to relatively small changes in assumptions. For instance, the values for the Move to More Productive Jobs impacts vary from a disbenefit of £240 million to benefit of £200 million (PV 2010 prices/values over 60-year appraisal period) for both stations combined, depending on whether it is assumed that the additional jobs at Old Oak would have been located at Ealing or Hammersmith & Fulham, if not at Old Oak. This is summarised in Table 23 below.

Table 23: Indicative estimates of Move to More Productive Job benefits by scenario (£m, PV, 2010 prices)

	Test 1 DS Productivity	Test 2 DS Productivity	Test 3 DS Productivity
DS1: Hythe Road and Old Oak Common Lane	35	-237	197
DS2: Hythe Road Only	29	-65	124
DS3: Old Oak Common Lane Only	5	-172	73

7.97. The three tests presented in Table 23 refer to a range of assumptions regarding productivity, namely:

i. Test 1 - assuming the average of the WebTAG Hammersmith & Fulham and Kensington & Chelsea productivity value for Old Oak South and the average of the Hammersmith & Fulham and Ealing figures for Old Oak North and Acton North as illustrative of future potential values;
ii. Test 2- assuming Ealing productivity figures for all three areas (Old Oak South, Old Oak North and Acton North); and
iii. Test 3 - assuming Hammersmith productivity figures for all three areas.

7.98. Similarly, the value of dependent housing would be strongly influenced by the characteristics of the area and for instance, whether future land values would most closely match Ealing, Hammersmith & Fulham, Kensington & Chelsea or elsewhere. The amount of road traffic and associated externalities on the congested inner London network caused by the development would also be very important in influencing the scale of the net impact.

7.99. As shown in Table 24, the illustrative tests reported suggested values of net impact of dependent development ranging between a disbenefit of £10 million to a benefit of over £50 million for both stations (PV 2010 prices and values) depending on the land values assumed and the degree to which land value is assumed to increase with density.

Table 24: Indicative estimates of value of housing from dependent development by scenario (£m, PV, 2010 prices)

	WebTAG housing land values					
	Ealing values		Hammersmith & Fulham values		Kensington & Chelsea values	
	1/3*	2/3*	1/3*	2/3*	1/3*	2/3*
DS1: Hythe Road and Old Oak Common Lane	-9	-4	2	18	19	52
DS2: Hythe Road Only	-5	-3	1	11	11	31
DS3: Old Oak Common Lane Only	-4	-2	1	7	7	20

Note: *1/3 and 2/3 refer to the assumed elasticity of housing land value uplift to housing density uplift

7.100. For the reasons explained above, the Level 3 benefits presented in Table 23 and Table 24 should therefore be considered indicative only. They are intended to prove and illustrate the logic of the transmission mechanisms through which the scenarios could cause benefits and further enhance the economic case for the scheme.

7.101. There are negative values in each range, suggesting potential disbenefits. These highlight the sensitivity of the outcomes and help to understand the conditions necessary for benefits to be achieved. However, overall, as outlined above, the factors considered in the analysis and the contextual details on background trends in employment location and housing shortages make a strong logical case that increasing employment and housing space in well connected locations at the Old Oak hub should lead to net national impacts on productivity and land value, if the development is carefully managed and the Old Oak and Park Royal Opportunity Area is successful as a whole.

7.102. The economic appraisal results for each option including Wider Impacts and level 3 benefits are summarized in Table 25 overleaf.

Table 25: Economic appraisal results including Level 2 & Level 3 benefits (£m, PV, 2010 prices)

	DS1: Old Oak Common Lane and Hythe Road		*DS2: Hythe Road Only*		*DS3: Old Oak Common Lane Only*	
Present Value of Costs (PVC)	300		194		105	
	TfL VoT	DfT VoT	TfL VoT	DfT VoT	TfL VoT	DfT VoT
Initial Present Value of Benefits (PVB)	496	444	201	180	304	271
Initial Net Present Value (NPV)	196	144	7	-14	199	166
Initial Benefit Cost Ratio (BCR)	*1.7 to 1*	*1.5 to 1*	*1.1 to 1*	*0.9 to 1*	*3 to 1*	*2.7 to 1*
Wider Economic Impacts	*152*	*152*	*76*	*76*	*66*	*66*
Adjusted Present Value of Benefits (PVB)	648	596	277	256	370	337
Adjusted Net Present Value (NPV)	348	296	83	62	265	232
Adjusted Benefit Cost Ratio (BCR)	*2.2 to 1*	*2.0 to 1*	*1.4 to 1*	*1.3 to 1*	*3.5 to 1*	*3.2 to 1*
Move to More Productive Jobs	-237 to 197		-65 to 124		-172 to 73	
Dependent Development	-9 to 52		-5 to 31		-4 to 20	

Sensitivity tests

7.103. Additional analysis has been undertaken to examine the value for money case for delivering Hythe Road station if the capital costs of constructing the viaduct are excluded. Based on a high level cost estimate provided by London Overground, the viaduct (includes passive provision for a station) consists of around 60 – 70 per cent of the overall station costs under the central case.

7.104. The benefit-cost ratio would increase significantly if the costs of viaduct are excluded. Including the wider benefits, the BCR would increase from 1.4 to 1 to 2.6 to 1, moving from the 'Low Value for Money' category to 'High Value for Money' category.

7.105. A number of other sensitivity tests have also been undertaken, to understand the impact on station demand and passenger benefits of changes to key model parameters and network/demand assumptions:

i. Boarding penalty changed at Hythe Rd and Old Oak Common Lane: Main assumption is 7 minutes with 3.5 minutes and 0 minutes tested as sensitivities. Implemented by changing boarding penalty with Railplan assignment process.
ii. Walk links between all Old Oak area stations: 50 per cent longer and 50 per cent shorter than main assumptions tested as sensitivity. Modified within Railplan network by changing the link length.
iii. Platform walk links within all Old Oak area stations: 50 per cent longer and 50 per cent shorter than main assumptions tested as sensitivity. Modified within Railplan network by changing the link length.
iv. Walk links to access Old Oak Common HS2/Elizabeth line/National rail station platforms: 50 per cent longer and 50 per cent shorter than main assumptions tested as sensitivity. Modified within Railplan network by changing the link length.
v. No changes to bus services: No bus provision in Old Oak development area. Bus service coding that was added in the Old Oak development area removed.
vi. Heathrow Third Runway: Main assumption is 90 million air passengers by 2031 with existing runways. 130 million air passengers with a third runway tested as sensitivity (with existing mode splits). Railplan Heathrow demand factored up within demand matrices.
vii. HS2 terminates at Old Oak as opposed to running to Euston. Railplan service coding changed. No changes to demand.
viii. Crossrail 2: addition of Crossrail 2 demand and network to the Railplan Do Minimum scenarios.
ix. Old Oak Development Assumptions: OPDC Development Capacity Study (DCS) homes and jobs forecasts for Old Oak Common and Park Royal area from Spring 2017. Sensitivity test assumed 792 fewer homes and 4,581 more jobs when compared to the Development Demand assumptions. The demand distribution within the Old Oak area was based on development locations supplied by OPDC.

7.106. Table 26 shows the expected change in the Old Oak area station demand under each sensitivity test. The change is the difference in station demand against the Do Minimum where HS2, Elizabeth line and Great Western stop at Old Oak Common plus the Old Oak development demand. Both Hythe Road and Old Oak Common Lane Overground stations are assumed to be in place.

7.107. Table 27 shows the change in time saving benefits that would form an input to the calculation of a benefit-cost ratio. Time savings comprise of around 90 per cent of benefits and illustrate the impact of the change not only on demand, but also on the extent of time saving realised by passengers.

7.108. Analysis of the sensitivities shows that some assumptions have a significant bearing on station demand and benefits. Some of these are within the control or specification of the modeller such a

7.109. s a boarding penalty and some are not such as the development assumptions. The key variables that have been identified are:

i. Accuracy of walk network and station walking distances: Changes to distances have a significant impact. There is a marginal impact on new Overground station demand but very significant impact on the size of benefits. This highlights that the walk times and networks need to be accurate using the best available drawings and as much detail as possible. Could increase benefits by up to 50 per cent if walk links are too short or over estimate by up to 28 per cent if too long.
ii. Boarding Penalty: This is a modeller judgment that has a significant impact on both station demand and benefits. We have used conventional Railplan approach but benefits could be up to 30 per cent higher if no boarding penalty is used.
iii. Alternative OPDC Growth Assumptions: these could increase demand at Hythe Road by up to 1.5 million passengers per annum with Old Oak Common Lane demand being largely unchanged. This is mainly driven by development distribution changes as opposed to absolute population or job growth. Passenger time saving benefits could be up to 12 per cent higher.
iv. HS2 terminating at Old Oak Common: This has a dramatic impact with a 48 per cent increase in time saving benefits and an additional 2.3 million passengers at Hythe Road and 1.1 million at Old Oak Common Lane. This position is unlikely given the position with the HS2 project and the powers that it now has available.
v. Old Oak area bus changes: 33 per cent increase in time savings benefits and negligible impact upon station demand.
vi. Heathrow Third Runway has no impact on station demand and but 20 per cent impact on Overground station benefits.
vii. Crossrail 2 causes a small reduction in new station demand and a small change in benefits and does not have a significant impact on the case for either station.

Table 26: 2041 annual station demand, sensitivity tests vs. central case

Growth Scenario		Hythe Rd	Old Oak Common Lane	OOC Elizabeth Line	OOC HS2	OOC GW and HEX	Willesden Jcn	North Acton
Core Case: OOC Demand + HS2 + London Plan Growth		4.1m	3.3m	69.7m	34.1m	25.5m	14.1m	5.8m
Sensitivity Test assuming: OOC Demand + HS2 + London Plan Growth Scenario								
Boarding Penalty Sensitivity	Hythe Rd/Old Oak Common Lane 3.5min boarding penalty	+0.5m	+0.3m	-0.1m	+0.1m	-0m	-0.1m	-0m
	Hythe Rd/Old Oak Common Lane 0min boarding penalty	+1.3m	+1m	-0.4m	+0.2m	-0m	-0.2m	-0m
No Bus through Old Oak Development	No Bus changes related to OOC redevelopment	+0.3m	+0m	+0m	-0.8m	+0.6m	+0.9m	+0.4m
HS2	HS2 Terminates at OOC	+2.3m	+1.1m	+72.3m	+83.4m	+2.9m	+0.1m	+0.4m
Walk Network Sensitivity	Walk links between OOC area stations - 50% Longer	-0.2m	-0.4m	-0.5m	-0.2m	-0m	+0.2m	+0m
	Walk links between OOC area stations - 50% Shorter	+0.8m	+0.5m	+0.6m	+0.3m	+0.2m	-0.4m	-0.1m
OOC Station Network	Hythe Rd/Old Oak Common Lane Station Access Links - 50% Longer	-0m	-0.1m	-1.3m	-0.2m	-0m	+0m	+0.1m
	Hythe Rd/Old Oak Common Lane Station Access Links - 50% Shorter	+0m	+0.1m	+1.5m	+0.2m	+0.1m	-0.2m	-0.1m
	OOC Elizabeth Line Station Interchange Links - 50% Longer	+0.2m	+0.1m	-11.5m	-3.3m	-0.7m	+0.1m	+0.2m
	OOC Elizabeth Line station Interchange Links - 50% Shorter	-0.3m	-0m	+21.8m	+4.5m	+11.9m	-0.3m	-0.2m
Heathrow Third Runway	Increase in Heathrow related passenger numbers	+0m	+0m	+2.7m	+0.3m	+0.9m	+0m	+0m
Demand Growth	Alternative Growth Assumptions	+1.5m	-0m	+1.4m	-0.1m	+0.7m	-0.4m	+2.1m
Crossrail 2	With Crossrail2	-0.5m	-0.2m	+7m	+0.4m	+0.8m	-0.8m	+0.6m

Table 27: 2041 annual time saving benefits, sensitivity tests vs. central case

Growth Scenario		Change in Annual 2040 Time Savings (£m)
Core Case: Development Demand + HS2 + London Plan Growth		**£97.6m**
Sensitivity Test assuming: OOC Development Demand + HS2 + London Plan Growth Scenario		
Boarding Penalty Sensitivity	Hythe Rd/Old Oak Common Lane 3.5min boarding penalty	+£15.2m +15.6%
	Hythe Rd/Old Oak Common Lane 0min boarding penalty	+£29.1m +29.8%
No Bus through OOC Development	No Bus changes related to OOC redevelopment	+£32.3m +33%
HS2	HS2 Terminates at OOC	+£46.4m +47.5%
Walk Network Sensitivity	Walk links between OOC area stations - 50% Longer	+£6.3m +6.5%
	Walk links between OOC area stations - 50% Shorter	+£48.4m +49.6%
OOC Station Network	Hythe Rd/Old Oak Common Lane Station Access Links - 50% Longer	-£27.8m -28%
	Hythe Rd/Old Oak Common Lane Station Access Links - 50% Shorter	+£42.2m +43%
	OOC Elizabeth Line Station Interchange Links - 50% Longer	+£33m +33.8%
	OOC Elizabeth Line station Interchange Links - 50% Shorter	+£7.6m +8%
Heathrow Third Runway	Increase in Heathrow related passenger numbers	+£21m +21.5%
Demand Growth	Alternative Growth Assumptions	+£11.7m +12%
Crossrail 2	With Crossrail2	+£8.3m +8.5%

Conclusion: The economic case varies by option but delivery of the full scheme would deliver High Value for Money

7.110. The two new stations proposed at Old Oak serves different purposes. Old Oak Common Lane meets a need of providing interchange with HS2 at Old Oak Common, with more than half of the station demand coming from the HS2 station complex. In contrast, Hythe Road has nearly 40 per cent of its demand coming from the Old Oak development and without this the case for the station is much reduced.

7.111. This assessment of the potential new Overground stations at Old Oak Common has confirmed that there is no case for either station without HS2 or the development of the Old Oak area taking place. There is potentially a positive business case for Old Oak Common Lane, either delivered in isolation or together with Hythe Road.

7.112. If both stations are delivered, it offers a BCR of 2.2 to 1, demonstrating 'High Value for Money'. The case for Old Oak Common Lane in isolation offers a BCR of 3.5 to 1 if wider benefits are taken into account that would be considered to offer 'High Value for Money'. The case for Hythe Road is less clear with a BCR of 1.4 to 1 with wider benefits which is considered 'Low Value for Money'. If the costs of viaduct are excluded, Hythe Road would have a positive business case with a BCR of 2.6 including wider benefits and demonstrating 'High Value for Money'.

7.113. Recommendations for the next stage of work would include:

i. LTS runs for each DS scenarios;
ii. LonLUTI runs to see impacts from land use on transport and on additional jobs and homes;
iii. Use updated development demand from either OPDC's masterplan or draft local plan when became available;
iv. Refine cost modelling;
v. Development demand phasing to be considered in the model.

Section 8: Financial Case

Section summary:

The Financial Case sets out the project and ongoing operating costs, and financing and funding arrangements to deliver the scheme

- The capital cost including land compensation for Hythe Road is £185.7m in 2016 prices. The outturn cost, which includes inflation between 2016 and the assumed year of construction (2022) is £227.6m.
- The capital cost including land compensation for Old Oak Common Lane is £130.6m in 2016 prices. The outturn cost, which includes inflation between 2016 and the assumed year of construction (2025) is £182.5m.
- Additional station operating costs borne from the new London Overground stations are estimated based on experience of costs from the existing London Overground concession for equivalent stations. These costs total £0.7 million, which combined with the service costs of £1.74 million, gives a total operating cost of £2.5 million per annum in 2016 prices.
- This additional demand is forecast to generate £12 million (PV, 2010 prices) in revenue over the appraisal period with £5 million from Hythe Road and £8 million from Old Oak Common Lane.

Financially, none of the three scenarios tested offer a position where revenue balances costs to both DfT and TfL:

- If Old Oak Common Lane station is delivered, TfL will incur capital and operating costs of £141 million over the 15 year assessment period. This would result in a funding gap of -£147 million over 15 years.
- If Hythe Road is delivered, TfL will incur capital and operating costs of £205 million over the 15 year assessment period and resulting in a funding gap of -£232 million.
- If both stations are delivered, TfL will incur capital and operating costs of £346 million over the 15 year assessment period and resulting in a funding gap of -£378 million over 15 years.
- Old Oak Common Lane delivered in isolation offers the best position to both DfT and TfL in terms of the smallest net revenue and cost gap. Consideration should be given to other funding sources such as a developer contribution in the case of Hythe Road and an attempt to capture the DfT revenue benefits in the form of a contribution towards costs. Old Oak Common Lane potentially offers the worst position in terms of developer contribution as a significant proportion of passengers are HS2 transfers as opposed to demand from the OPDC development.
- If the scheme is to progress, a full funding package will need to be identified in advance of TfL submitting a TWAO application, potentially by 2020.

The Financial Case sets out the project and ongoing operating costs, and financing and funding arrangements to deliver the scheme

Capital costs

8.1. Capital cost estimates for the scheme have been developed by TfL's consultant team for the GRIP 3 study led by Arcadis. Table 28 sets out the capital cost estimates for Hythe Road and Old Oak Common Lane.

8.2. The costs in Table 28 are GRIP3B costs with the exception of risk estimate which is at GRIP3A and will be updated when the project is further developed. Note that a level of optimism bias of 64 per cent has been assumed for the purposes of the business case which is considered an appropriate uplift for this early stage of the GRIP 3 study. The level of optimism bias will be reduced as the project advances.

Table 28: Old Oak new Overground stations capital costs estimate (£m, Q3 2016 prices, factor costs)

Item	Hythe Road	Old Oak Common Lane
Railway control systems	4.4	3.8
Train power systems	2.6	2.6
Electric power and plant	0.4	0.3
Permanent Way	3.1	3.0
Operational telecommunications systems	0.7	0.8
Buildings and property	11.1	10.6
Civil engineering	28.9	10.1
Enabling works	1.0	5.6
Direct construction works	**52.4**	**36.7**
Preliminaries (25%)	13.5	10.3
Overheads and profit (13%)	8.6	6.1
Indirect construction works	**22.0**	**16.4**
Design team fees (10%)	7.4	5.3
Project management team fees (12%)	16.2	13.0
Other project costs (including possessions)	12.4	14.5
Employer's Indirect Costs	**36.1**	**32.8**
Sub-total	**110.5**	**85.8**
Risk (GRIP3A)	44.9	37.7
Sub-total	**155.4**	**123.5**
Property compensation	30.3	7.1
PROJECT ESTIMATE	**185.7**	**130.6**

8.3. The capital cost for Hythe Road is £185.7m in 2016 prices. The outturn cost, which includes inflation between 2016 and the assumed year of construction (2022) is £227.6m. The capital cost for Old Oak Common Lane is £130.6m in 2016 prices. The outturn cost, which includes inflation between 2016 and the assumed year of construction (2025) is £182.5m. For both stations the inflation is estimated at 4 per cent per year[27]. The capital cost estimates are based on several key assumptions and exclusions. These are detailed in the Option Selection Report prepared by Arcadis. One exception to this is the property compensation cost. An estimate of this has not yet been prepared for this stage of the project. The property cost included in Table 28 therefore uses an estimate calculated for the previous stage of work in 2014, uplifted to 2016 prices.

Rolling stock requirements assessment

8.4. An assessment of the number of additional trains required to serve the new stations has been made. It has been identified that the additional time to call existing services at the new stations is expected to be accommodated within the existing rolling stock fleet as it can be accommodated without a full timetable recast. However, as part of the scheme it is proposed that the 2 tph service currently operated by Southern which terminates at Shepherds Bush will be extended to terminate at Hythe Road station. A timetable assessment has demonstrated that one additional 8-car unit is required to enable this extension of services. The lease costs for this additional rolling stock are included in the operating costs discussed below.

Operating costs

8.5. Operating costs have been calculated to take account of key industry and train operator costs. There are two main components of the costs: those for service changes (extending the Shepherds Bush terminating services to Hythe Road) and those for operating and maintaining the new stations. The service change costs are principally a factor of distance operated and have been factored on that basis. Costs are reported on a whole industry basis and include costs for both Overground concession service and those operating as part of the Thameslink, Southern and Great Northern franchise. In these calculations, the Overground services are assumed to operate at 5-car length, consistent with current train lengths.

8.6. As shown in Table 29, the modelling assumes a 5 tph service continues to operate on the Overground network on each of the Richmond and Clapham Junction branches.

[27] The inflation is provided by Arcadis for the outturn costs.

Table 29: Breakdown of operating costs per annum (2016 prices)

Cost Element	Old Oak Common Lane	Hythe Road	Assumption
Stations			
Station Staffing	£0.2m	£0.2m	£50k per staff member
Staff Recruitment and Training	£0.05m	£0.05m	3 months training at £15k per person. £10k for recruitment.
Lift Maintenance	£0.04m	£0.02m	£10k per lift per annum
Ticket Vending Machine Maintenance	£0.02m	£0.03m	Average from historic cost
Gateline Maintenance	£0.003m	£0.003m	CUBIC Estimate
General Station Maintenance e.g. cleaning	£0.05m	£0.05m	Estimate
Sub Total	**£0.363m**	**£0.353m**	
Southern Train Service Extension			
Variable Track Access Charge (VTAC)	-	£0.008m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.057 per vehicle km.
Capacity Charge	-	£0.028m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.186 per vehicle km.
Electrification Asset Use Charge	-	£0.0012m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.008 per vehicle km.
Electricity Charges for Traction (EC4T)	-	£0.066m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.432 per vehicle km.
Train Driver Staffing	-	£0.22m	£55k per staff member
Train Driver Recruitment and Training	-	£0.19m	10 months training at £45k per person. £10k for recruitment.
Rolling Stock Lease for an 8car train	-	£1.10m	£138k per train vehicle. One train of 8 vehicles.
Rolling Stock Maintenance and Cleaning		£0.124m	3.2km extra per single journey, 24 trains per day, 252 days operation. 8 car train. £0.80 per vehicle km.
Sub Total	**-**	**£1.74m**	

8.7. Whilst it is likely that further capacity enhancements on Overground services will be required to accommodate forecast increased demand across London, these enhancements are not defined or funded at the present time and therefore cannot be assumed in this business case. They are being considered in a separate project by TfL.

8.8. The Southern services are assumed to all operate at 8-car train length, including those proposed to terminate at Hythe Road station. This reflects the lengthening of some trains expected as part of a cascade of rolling stock prompted by the Thameslink Programme, due to be completed in 2018.

8.9. Station operating costs have been calculated based on comparative actual costs of operating equivalent stations on the Overground network. In advance of the detailed operating model for the stations being known, several assumptions have been used in estimating the operating costs. The breakdown of operating costs and key assumptions are also detailed in Table 29.

8.10. There is a only a small overall increase in the number of train miles operated per annum as a result of extending some Southern services from Shepherds Bush to Hythe Road, and therefore there is only a relatively small increase in the total service operating costs as shown in Table 29 of £1.74 million (2016 prices). The number of unit miles per annum increases by approximately 16,000 overall.

8.11. Industry costs are calculated on the basis of the existing Class 378 units operating on London Overground services and Class 377/7 units operating on Southern services.

8.12. As with industry charges, train driver costs are based on the number of unit miles operated. In practice, driver costs will be a factor of the number of diagrams required to operate the train service. However, given the scheme is currently under development and as the actual timetable operated may differ by the time the stations open because of the need to provide extra capacity on the network, basing costs on distance operated is considered sufficient for this stage of business case assessment.

8.13. Additional station operating costs borne from the OOOS are estimated based on experience of costs from the existing London Overground concession for equivalent stations. These costs total £0.7 million, which combined with the service costs gives a total operating cost of £2.5 million per annum in 2016 prices.

8.14. Renewal costs have been assumed for new assets that have a finite life and that do not already exist on the network. These relate to the addition of a junction and track for a reversing siding at Hythe Road station and lift replacement at both stations. Some assets added by the project are replacements for those already in existence and in this case it is assumed that Network Rail is already funded to maintain these assets and no further renewal cost is included. Cost estimates and their frequency of replacement have been developed by Arcadis (June 2017) as shown in Table 30 below.

Table 30: Asset Renewal Cost Estimate (£m, 2016 prices)

Asset	Renewal Frequency	Old Oak Common Lane	Hythe Road
LED Signal and Indicator	Every 10 years	-	£0.144m
Train Detection and Protection Systems	Every 10 years	-	£0.175m
Slab Track Renewal	Every 35 years	-	£0.21m
Ballast Track Renewal	Every 40 years	-	£0.18m
Points Renewal	Every 20 years	-	£0.57m
Lifts Renewals	Every 25 years	£1.81m	£0.91m

Revenue

8.15. Changes in revenue as a result of opening the Old Oak new Overground stations have been developed using outputs from the Railplan model. The revenue is calculated by applying a revenue yield per passenger kilometre to the total change in passenger kilometres. This is the standard industry method of calculating revenue and is considered sufficiently robust for the purposes of assessing the business case of a scheme. This standard methodology is not designed to differentiate between specific different fares offered on different services.

8.16. This is generally not a significant issue in London where the majority of passengers use Oyster or Travelcards rather than point-to-point tickets with their varying fares. Different revenue yields are applied to different types of service, e.g. a yield of £0.135 per passenger kilometre (2010 prices) is applied to rail services, which differs from the yield applied for LU and bus services.

8.17. The yield per passenger kilometre has been calculated from revenue data for Train Operating Companies in London and the South East, and is considered appropriate to use for this calculation.

8.18. The two new stations improve the accessibility of Old Oak and also provide easy access to HS2 and the Elizabeth line services. This change in network connectivity will generate additional demand on the network due to passengers switching from cars. This additional demand is forecast to generate £12 million (PV, 2010 prices) in revenue over the appraisal period with £5 million from Hythe Road and £8 million from Old Oak Common Lane. This is a relatively small figure and reflects the expectation that the majority of users of the new stations will not be trips that are new to public transport but will instead be switching from other public transport modes such as buses or other rail services.

8.19. A further factor affecting the relatively small amount of revenue generated is that the level of residential and office development is kept constant between the Do Minimum and Do Something scenarios. The level of trip generation and therefore new revenue calculated by the model is therefore limited. The fare zone in which the new stations will be located has also not yet been determined and this will also influence the revenue generated by the stations in future.

Financial Assessment

8.20. The financial assessment has been undertaken over a 15 year time horizon from the start of costs being incurred in 2025. This length of time has been used as it reflects the period over which revenue forecasts have been modelled and is also before significant renewal costs are incurred at each of the stations.

8.21. The financial assessment is heavily dependent on non controllable economic factors such as RPI growth and also variables such as fares policy over which there is some certainty. This should be borne in mind when considering the potential variability of forecasts over time and that there is a degree of uncertainty as to the future. The financial assessment has used TfL Business Planning RPI assumptions to convert into actual prices over time. No fares growth has been assumed and revenues are assumed to rise in line with RPI.

8.22. The details of the financial assessment for the three scenarios are summarised below.

Old Oak Common Lane station

i. The station generates additional Overground revenue of £55.4m over 15 years.
ii. The increase in Overground revenue is offset by a reduction in revenue on other TfL modes resulting in a net reduction in TfL revenue of -£5.8m over 15 years. The reduction in revenue overall is explained by people being able to make more direct journeys and not having to travel via Zone 1 with its higher fares.
iii. TfL will incur capital and operating costs of £141m over the 15 year assessment period.
iv. The net TfL position in terms of costs versus revenues is a funding gap over 15 years of -£147m.
v. The DfT will not incur any additional costs but stands to gain a small amount of additional revenue of £31m over 15 years.
vi. The net position to both TfL and DfT in combination would be a funding gap of -£116m over 15 years, assuming the additional DfT revenue could be used in the net position against costs.

Hythe Road station

i. The station generates additional Overground revenue of £32.2m over 15 years.
ii. The increase in Overground revenue is offset by a reduction in revenue on other TfL modes resulting in a net reduction in TfL revenue of -£27.6m over 15 years. The impact of a loss of Zone 1 related revenue due to rerouting is greater than in the case of Old Oak Common Lane.
iii. TfL will incur capital and operating costs of £205m over the 15 year assessment period.
iv. The net TfL position in terms of costs versus revenues is a funding gap over 15 years of -£232m.
v. The DfT will incur additional costs of -£30.8m over 15 years due to the extension of Southern services to Hythe Road. The DfT will gain £41m in additional revenue over 15 years, giving a positive net position of £10.2m.
vi. The net position to both TfL and DfT in combination would be a funding gap of -£222.6m over 15 years assuming that the additional DfT revenue could be used in the net position against costs.

Old Oak Common Lane and Hythe Road station together:

i. The stations generate additional Overground revenue of £86.7m over 15 years.
ii. The increase in Overground revenues is offset by a reduction in revenues on other TfL modes resulting in a net reduction in revenue of -£32.2m over 15 years.

iii. TfL will incur capital and operating costs of £346m over the 15 year assessment period.
iv. The net TfL position in terms of costs versus revenues is a funding gap over 15 years of -£378m.
v. The DfT will incur additional costs of -£30.8m over 15 years due to the extension of Southern services to Hythe Road. The DfT will gain £72m in additional revenue over 15 years, giving a positive net position of £41.3m.
vi. The net position to both TfL and DfT in combination would be a funding gap of -£337m over 15 years assuming that the additional DfT revenue could be used in the net position against costs.

8.23. The financial assessment has demonstrated that Old Oak Common Lane delivered in isolation offers the best position to both DfT and TfL in terms of the smallest net revenue and cost gap. Consideration should be given to other funding sources such as a developer contribution in the case of Hythe Road and an attempt to capture the DfT revenue benefits in the form of a contribution towards costs. Old Oak Common Lane potentially offers the worst position in terms of developer contribution as a significant proportion of passengers are HS2 transfers as opposed to demand from the OPDC development.

Funding

8.24. The Old Oak new Overground stations have a substantial capital cost. This capital costs range from £182.5 million (Old Oak Common Lane only) to £410.1 million (both stations) in 2016 prices[28]. With one of the principal objectives of the scheme being to enhance the regeneration at the Old Oak area, it is clear that a proportion of the funding required to deliver the new stations will need to be sourced from these developments, either via section 106 commitments from specific developments, or from OPDC's Community Infrastructure Levy (CIL) funding. The former may be possible for specific developments immediately adjacent to the stations, whilst the latter is planned to be introduced across the OPDC area.

8.25. CIL funding is appropriate to use as it is expected that residents, workers and visitors to much of the OPDC area will benefit from the new stations, not just those travelling to and from the immediate area.

[28] The costs quoted include capital costs of the stations, land compensation and inflation; it does not include the whole life costs.

8.26. However, it must be recognised that CIL funding is extremely unlikely to be able to cover the full cost of the stations, with the OPDC's current estimates indicating that the CIL funding across the whole development area is less than the current estimate for the cost of the stations. Alternative sources of funding will therefore also be required.

8.27. Regulations specify that CIL charges can be set on viability grounds only and be at levels that would not put an undue cost burden on development or delay it from coming forward. Whilst the Overground stations would deliver an uplift in property and land values, a balance needs to be struck between extracting value via CIL and keeping development viable.

8.28. TfL may also be required to contribute towards the delivery of the new stations. The majority of services calling at the new stations are operated through TfL's London Overground concession and therefore much of the net revenue gain will benefit TfL. However, there is currently no funding for delivery of the new stations included in TfL's Business Plan. Furthermore, it is clear that additional capacity on the Overground network, particularly on the WLL, is required before it would be viable to open the new stations. Both background growth and increased passenger numbers resulting from the opening of the new stations and development in the OPDC area will put increased pressure on the Overground network. Without further capacity enhancements some services on the WLL would be operating at unacceptably high levels of crowding. TfL and the OPDC would be expected to contribute funding towards these wider capacity improvements. It is also possible that funding from other sources, including central Government, may emerge as the scheme is developed further.

8.29. A further uncertainty for the funding package at this stage is that the funding sources may vary depending on the option taken forward. For example, the developer of the Car Giant site has published an Economic Vision for their development which has stated that they will fund the difference between the cost of the embankment option and the cost of a viaduct for the rail infrastructure through their site on which Hythe Road station is located.

8.30. If the scheme is to progress, a full funding package will need to be identified in advance of TfL submitting a TWAO application, potentially by 2020. TfL will be working closely with the OPDC as part of the OPDC's wider development of the costs and funding sources for transport and other infrastructure across the site, to gain a better understanding of the funding package for the new stations. The potential funding sources are summarised in Table 31.

Table 31: Summary of potential funding source

Likelihood of funding	Potential funding source
	Developer contributions via S106 agreement
	OPDC CIL
	TfL Business Plan funding
	Central Government grant funding

	Funding source from which a contribution is most likely given effect of infrastructure on land and property values
	Funding source from which a contribution could be sought but would be subject to prioritisation and/or lobbying

Section 9: Commercial Case

Section summary:

The Commercial Case provides details on the proposed commercial structure, procurement approach and accounting implications of the project

- The OOOS are currently being promoted by TfL and supported by the OPDC and Network Rail and have been developed through close working with other stakeholders including the relevant local authorities (the London boroughs of Brent, Ealing and Hammersmith & Fulham), statutory authorities (such as affected utilities) and impacted land owners.
- It is a complex rail infrastructure scheme, promoted by experienced professional bodies responsible for transport in London and the impacted local areas.
- The infrastructure owner, Network Rail, is fully engaged with the project and the development of the stations has been undertaken in accordance with Network Rail' s GRIP process and they have provided 'Approval in Principle' (AiP) to the GRIP3 scheme design across all disciplines.
- The procurement route for the next stage of project, through the development and submission of a Transport & Works Act Order (TWAO) and then on to the construction stage is yet to be confirmed, with a number of options under consideration.
- Subject to funding and an agreement on the lead delivery organisation, either TfL or Network Rail would take responsibility for procurement and management of contractors
- At this stage in the project's development it is too early to identify the commercial structure and therefore the likely accounting treatment. It is therefore also not clear whether any liabilities would score against TfL borrowing. This area of uncertainty will become clearer as the project is developed further.

The Commercial Case provides details on the proposed commercial structure, procurement approach and accounting implications of the project

Procurement strategy and sourcing options

9.1. The Old Oak new Overground stations are being promoted by TfL and supported by the OPDC and Network Rail and have been developed through close working with other stakeholders.

9.2. These include the relevant local authorities (the London boroughs of Brent, Ealing and Hammersmith & Fulham), statutory authorities (such as affected utilities) and impacted Land Owners. The infrastructure owner, Network Rail, is fully engaged with the project. The development of the stations has been undertaken in accordance with Network Rail' s GRIP process and they have provided 'Approval in Principle' (AiP) to the GRIP3 scheme design across all disciplines.

9.3. It is a complex rail infrastructure scheme, promoted by experienced professional bodies responsible for transport in London and the impacted local areas.

9.4. As a public body, TfL has to meet the requirements of the Mayor of London's Responsible Procurement Policy consisting of the following themes:

i. environmental sustainability;
ii. supplier diversity;
iii. community benefits;
iv. skills and employment;
v. sustainable freight;
vi. fair employment; and
vii. ethical sourcing.

9.5. In compliance with the responsible procurement policy, all potential suppliers for future stages of work will be asked to consider these elements in their bid as part of the Invitation to Tender (ITT) for design and construction contracts. Each appointed consultant or contractor will be subject to a supplier performance plan.

Construction procurement and management

9.6. The procurement route for the next stage of project, through the development and submission of a Transport & Works Act Order (TWAO) and then on to the construction stage is yet to be confirmed, with a number of options under consideration. Subject to funding and an agreement on the lead delivery organisation, either TfL or Network Rail would take responsibility for procurement and management of contractors; both organisations being experienced in a variety of transport construction projects within London.

9.7. If delivered by TfL, the scheme will be managed within both TfL and Network Rail's standard procedures. The project is currently funded up to the completion of the GRIP3 design at the end of 2017.

9.8. A decision on whether and how to progress the scheme through the next stage of design and through a TWAO process is expected by summer 2018. Subject to such further progression the procurement strategy for the later stages of the project will be developed further, funding permitting.

Operational procurement and management

9.9. The existing London Overground network is operated through a concession held by TfL. This has proven to be a successful and reliable operating model for the London Overground network. The current holder of the concession is Arriva Rail (London). If the new stations do not open until 2026 then it is likely that this would be during the period of the subsequent concession and their operation would be specified during the procurement of that concession. However, Hythe Road station could be opened as early as 2023, and if this is the case it may be during the period of the current concession.

9.10. Negotiations between TfL and Arriva Rail (London) will be required to ensure that the concession holder takes responsibility for operating Hythe Road station, using the established approach adopted for any other changes that occur during the period of the concession which were not specified at the time of procurement.

9.11. The business case assumes an extension of 2 tph operated by the Southern franchise from Shepherds Bush to Hythe Road station. These services are not under the direct control of TfL and therefore negotiations will be required with the DfT and the incumbent train operator to ensure that this occurs when Hythe Road station opens.

9.12. Demand forecasts suggest that the extended services will be well used, so this is likely to be an attractive proposition for the franchisee operating these services if the revenue generated by the extension outweighs the costs. However, it will still be necessary to work closely with these organisations to deliver the service change. This would take place through well established fora already established between TfL, DfT, NR and the relevant train operating companies.

9.13. There are also rail industry regulatory processes that need to be followed to enable the stations to be constructed and operated. The Network Change process covers the delivery of the infrastructure, as part of which all interested rail operators and other interested parties are consulted on the proposals.

9.15. Responses to the consultation are reviewed by the Office of Rail and Road (ORR), who subsequently will make a decision on whether to approve the change. A draft Network Change notice was published for comment in December 2017, with responses due back in March 2018. A formal Network Change notice will be published as part of the next stage (GRIP4/5) of design work.

9.16. Both TfL's concession holder and the operator of the Southern services will need to apply for the necessary track access required to call their services at the new stations. Again, this is a regulatory process where interested rail industry parties are consulted and the ORR decides whether to approve the applications.

9.17. Network Rail also has a major input here by reporting in the access application whether or not it considers the changes to be operationally viable. Initial timetable assessment undertaken by TfL indicates that the changes in infrastructure and changes in services proposed can be accommodated within the timetable for passenger and freight services.

9.18. Access will be required to construct the stations to connect into existing operational infrastructure and therefore railway access and possessions will need to be planned and agreed through the rail industry access planning process.

Accounting implications

9.19. At this stage in the project's development it is too early to identify the commercial structure and therefore the likely accounting treatment. It is therefore also not clear whether any liabilities would score against TfL borrowing. This area of uncertainty will become clearer as the project is developed further.

Section 10: Management Case

Section summary:

The purpose of the Management Case is to assess whether a proposal is deliverable. It reviews evidence of project delivery from similar projects by the organisation, sets out the project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance.

- TfL has extensive experience in developing, promoting and implementing significant infrastructure projects such as the proposed new stations at Old Oak. This ranges from minor modifications to existing infrastructure (such as Hammersmith flyover refurbishment and Bank station upgrade) to major schemes such as the Elizabeth line and Northern line extension.
- The Old Oak new Overground stations have several complex linkages with other projects. Firstly, delivery of the new stations, particularly Hythe Road, must be complimented by capacity enhancements being delivered on the wider London Overground network. Another important interface is with the planned HS2/Elizabeth line/GWML station at OOC. Finally, there are a wide range of interfaces with developments in the OPDC area and the associated infrastructure interventions (including transport) required for the OPDC to realise its proposed masterplan.
- At a project level, the Old Oak new Overground stations is overseen by a fortnightly Working Group, attended by senior staff from across the business. The project reports into both a four-weekly internal Old Oak Programme Board, where senior TfL staff representing each of the transport projects provide updates and make decisions to ensure all interfaces between projects are identified and addressed, and a four weekly TfL/OPDC coordination group.
- The detailed programme beyond December 2017 has not been confirmed due to uncertainties over funding and the completion of the OPDC masterplan. However, subject to funding being identified and the completion of the OPDC masterplan by summer 2018, an indicative programme is included at Table 33. This identifies that the earliest possible date for a TWAO submission is 2020.
- If it was decided to progress Hythe Road station for delivery by 2023, then following TWAO approval a contractor could be appointed in 2021 with construction complete by 2023. The earliest likely date for delivery of Old Oak Common Lane station is 2026.
- The assurance and approvals process will follow TfL's established project assurance procedures which include assurance at three levels: internal, Programme Management Office (PMO) and external.

The purpose of the Management Case is to assess whether a proposal is deliverable. It reviews evidence of project delivery from similar projects by the organisation, sets out the project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance

Evidence of similar projects

10.1. TfL has extensive experience in developing, promoting and implementing significant infrastructure projects such as the proposed new stations at Old Oak. This ranges from minor modifications to existing infrastructure (such as Hammersmith flyover refurbishment and Bank station upgrade) to major schemes such as the Elizabeth line and Northern line extension.

10.2. Major schemes developed, promoted and implemented by TfL or its predecessors in recent years include the Jubilee line Extension, a major programme of extensions to the DLR, the London Overground network, the Emirates Airline cable car and the Elizabeth line (the latter jointly with the DfT). On the London Overground network, TfL is currently working on the Barking Riverside Extension in east London which involves a 3.2km extension of the extension with a new terminus station and recently received planning approval through the granting of a TWAO. Several aspects of this scheme are similar to the Old Oak new Overground stations project including a new rail viaduct and new build station. These projects have been progressed through the planning system using a range of routes including the TWAO route which is proposed for this scheme.

10.3. TfL also has experience of delivering new stations on the existing rail network, for example the opening of Langdon Park station on the DLR and Wood Lane on the London Underground. TfL is also working on several major station enhancements on the London Overground network including schemes at West Hampstead, Hackney Wick and Tottenham Hale, all of which have similar features to the Old Oak new Overground stations.

Linkages

10.4. The OOOS have several complex linkages with other projects. Firstly, delivery of the new stations, particularly Hythe Road, must be complimented by capacity enhancements being delivered on the wider London Overground network. The WLL is forecast to be very crowded regardless of the new stations and development in the OPDC area, and opening a new station on a very crowded line would need to be managed in the context of the operation of the line as a whole.

10.5. There will therefore be a close interface with a future capacity enhancement on the WLL and potentially on the wider Overground network. The delivery of this wider enhancement is being developed and is currently unfunded however feasibility work to identify the best approach is funded and will be undertaken during the early part of 2018. This is therefore clearly a substantial risk to the Old Oak new Overground stations project.

10.6. Another important interface is with the planned Old Oak Common HS2/Elizabeth line/National rail station. The provision of pedestrian links from each of the new Overground stations to the HS2/Elizabeth line/National rail station is proposed, and TfL, OPDC and HS2 are currently working together to determine the scope of the links and the delivery strategy, with HS2 Ltd already committed to delivering the parts of these links within their limits of deviation as dictated by the HS2 Hybrid Bill. TfL is working with all parties to ensure that the interface between the two projects is well managed so that there is a seamless join on the pedestrian links between the parts being delivered by different parties.

10.7. Finally, there are a wide range of interfaces with developments in the OPDC area and the associated infrastructure interventions (including transport) required for the OPDC to realise its proposed masterplan.

10.8. In particular, a very close linkage exists with the developer of the Car Giant site within which Hythe Road station is located. The option chosen for Hythe Road station has a fundamental impact on this development so regular liaison is taking place both to ensure this interface is successfully managed and develop funding opportunities.

10.9. With regard to other transport infrastructure within the OPDC area there are some considerable uncertainties as the OPDC masterplan is still under development. For example, the bus strategy for serving the site is not confirmed, at least partly because the road network layout cannot yet be confirmed. It is expected that the OPDC masterplan will not be finalised until Summer 2018.

10.10. TfL is therefore ensuring that continuous liaison happens between the Old Oak new Overground stations project, the OPDC and project teams working on other aspects of the transport infrastructure,. It is clearly necessary for the project to maintain some flexibility so that designs can be adapted to interface successfully with the rest of the development, for example with regard to the location and layout of bus infrastructure adjacent to the new stations.

10.11. Future iterations of this business case will take into account emerging information with regard to other projects, for example the bus strategy for the Old Oak area as it is developed, to ensure the overall transport plans for the area are represented as robustly as possible.

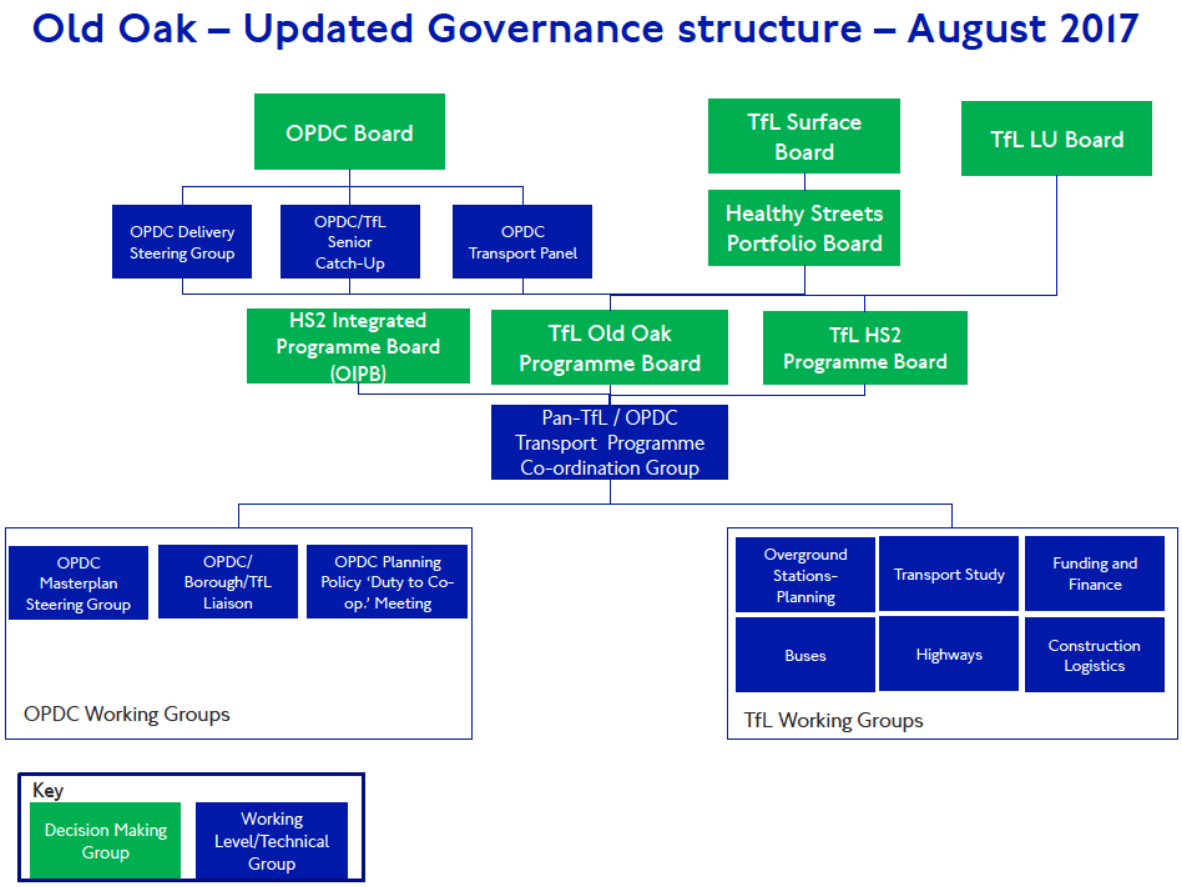
Governance, organisational structure and roles

10.12. At a project level, the Old Oak new Overground stations is overseen by a fortnightly Working Group, attended by senior staff from across the business.

10.13. The project reports into both a four-weekly internal Old Oak Programme Board, where senior TfL staff representing each of the transport projects provide updates and make decisions to ensure all interfaces between projects are identified and addressed, and a four weekly TfL/OPDC coordination group.

10.14. The Old Oak Programme Board informs both the London Underground Board and (via the Healthy Streets Board) the Surface Transport Board and the OPDC Transport Panel, which has director level representation from TfL, the OPDC, Network Rail and other stakeholders is ultimately responsible for the development of transport schemes in the OPDC area. The scheme is regularly discussed at the Panel with recommendations made to inform the project's development. This is shown in Figure 24.

Figure 24: Old Oak governance structure



Programme

10.15. The key milestones for the current funded design phase of the project are set out in Table 32.

Table 32: Key project development milestones (current design phase)

Milestone	Indicative completion date	Means of verification
Establish project team for technical and other studies	March 2016	Establishment of team
Instruction of GRIP 3 study	July 2016	Tender brief and contract issued
Instruction to undertake Socio-economic and Wider Economic Impacts (WEI) assessment and	May 2017	Tender brief and contract issued
Completion of GRIP 3 study	December 2017	Completed single option selection report and published Network Change Notice
Completion of Approval in Principle	November 2017	Signed, Network Rail endorsed
Final public consultation report	December 2017	Published consultation report
Publication of Business Case	December 2017	Published business case report
Preparation of paper to TfL Board detailing completion of study and recommending next steps towards submission of TWAO application	December 2017	Paper submitted to TfL Board

10.16. The detailed programme beyond this date has not been confirmed due to uncertainties over funding and the completion of the OPDC masterplan. However, subject to funding being identified and the completion of the OPDC masterplan by summer 2018, an indicative programme is included at Table 33. This identifies that the earliest possible date for a TWAO submission is 2020.

10.17. If it was decided to progress Hythe Road station for delivery by 2023, then following TWAO approval a contractor could be appointed in 2021 with construction complete by 2023. The earliest likely date for delivery of Old Oak Common Lane station is 2026.

Table 33: Potential Timeline to Powers

Activity	Indicative Duration	Possible date
Transport and Works Act Order		
Procurement (TWAO only)	3 months	August - October 2018
Scheme assessment and TWA Order document preparation	12 months	November 2018 – November 2019
Order Submission	1 week	November 2019
Statutory Consultation	2 months	December – January 2020
Statement of Case and Inquiry preparation	5 months	January 2020 – May 2020
Public Inquiry	Ranges between 2 - 12 weeks (but actually depends on the number of objectors and is set by the Inspector approximately 6 months after the start of the statutory consultation)	June 2020
TWA Order Decision	Likely 6 - 12 months after the conclusion of the Public Inquiry	December 2020 – June 2021
Estimated Duration	28 - 33 months	

Assurance and approvals plan

10.18. The assurance and approvals process will follow TfL's established project assurance procedures which include assurance at three levels: internal, Programme Management Office (PMO) and external.

10.19. Internal assurance is provided through Pathway (TfL's project management methodology) project stage gates and/or peer reviews involving the sponsor and delivery personnel either from within the project or from a peer project. Underlying these stage gates are a number of assurance activities conducted by both TfL and the suppliers and include activities such as design reviews, safety assessments, risk reviews, commercial assessments, estimate validation, material testing, site inspections and product testing.

10.20. The number and timing of the stage gates are established by the delivery organisation, based on guidance in Pathway, and informed by a characterisation tool that considers such areas as scale, complexity, novelty, project team experience and the strategic importance of the project. A number of products are required to be completed to provide evidence at the stage gate that the project is fit to proceed to the next stage.

10.21. Products are outputs that are signed off by authorised individuals, and include such documents as project execution plans, risk management plans, project estimates and design compliance certificates.

10.22. The PMO is part of TfL but is not accountable for delivery. These reviews are typically Integrated Assurance Reviews (IARs), staffed by a combination of PMO staff, consultant external experts or peer groups from outside the delivery organisation.

10.23. The external experts are selected on the basis of their relevant experience and suitability to the project under review. Each review is covered by terms of reference that set the scope and the brief to the external expert, who is procured from a TfL consultancy framework. The terms of reference are based on the Pathway IAR Lines of Enquiry, aimed at generating a comprehensive review. Each Line of Enquiry includes up to 20 detailed challenges, devised to match the maturity of the project at its particular point in its life cycle.

10.24. The Lines of Enquiry were developed as part of the Corporate Gateway Approval Process (CGAP) in 2008, following a comprehensive benchmarking process that assessed the assurance regimes in other organisations and the Office of Government Commerce who produced gateway processes and guidance (now part of the Cabinet Office). Some additions have been made since 2008, including more explicit challenges covering cost benchmarking.

10.25. The IAR report is considered by appropriate bodies prior to seeking authorisation. For projects over £50 million the TfL Finance and Policy Committee and Board are informed of the assurance reviews carried out.

10.26. IARs are conducted at key stages of the project:

i. initiation;
ii. option selection;
iii. pre-tender;
iv. contract award;
v. project close out;
vi. benefits delivery; and
vii. annual review (where no other IAR would happen within 12 months).

10.27. TfL also has an Independent Investment Programme Advisory Group (IIPAG) as further assurance for major projects. The involvement of the IIPAG is determined on both a risk based approach and a project value threshold. The IIPAG reviews are normally commissioned on projects with a value of £50m or more. The IAR process is as detailed above and the IIPAG then attends the Gate Review Meeting once the external expert's interim report has been produced. The IIPAG then produces its own reports, which are submitted at the relevant approval meetings alongside the PMO report, based on its review of the IAR material and discussions at the final Gate Review Meeting.

10.28. In October 2017, an option selection IAR was undertaken on the Old Oak new Overground stations project. The review raised no critical issues and concluded that the project was well managed.

Communications and stakeholder management

10.29. The Project Manager for the Old Oak new Overground stations project is responsible for keeping internal stakeholders appropriately engaged and informed. In accordance, regular, minuted meetings with a set agenda and actions have been arranged with all internal stakeholders.

10.30. Furthermore a Project Stakeholder Management Plan has been prepared which sets out the approach for managing stakeholders with an interest in this project.

10.31. The external stakeholders identified are summarised below:

i. the OPDC, the local planning authority;
ii. Network Rail, the infrastructure owner of the NLL and WLL;
iii. boroughs, especially the Boroughs of Hammersmith & Fulham and Ealing;
iv. political stakeholders, including councillors, Assembly Members and Members of Parliament;
v. statutory stakeholders;
vi. representative organisations (businesses, freight interests, motorists and public transport users); and
vii. land owners and local residents.

10.32. Public consultation for the Old Oak new Overground stations took place in autumn 2014 and again in autumn 2017. The responses to the 2017 consultation and any key issues raised will be analysed to determine if any changes are required to the engineering designs associated with the preferred options. Public views on the stations will also be considered as part of strategic case for the station and the overall decision making process for recommending next steps to the TfL Board. Dependent on the degree of change that has taken place a further statutory public consultation will be required in accordance with the pre-application requirements of the TWAO process. This may take the form of a project update rather than a consultation, if there have been no significant changes since the previous consultation.

10.33. TfL will develop programme controls supported by robust reporting processes that align with the project governance framework, integrating key stakeholder requirements, facilitating continuous monitoring, and incorporating accurate performance measurement. The purpose is to provide accurate project information in a timely way to ensure well informed decisions are made and appropriate action is taken.

10.34. The project management model will be designed to deliver a robust reporting regime, including:

i. governance meetings which form part of the reporting process as the forum where performance issues are raised, possible mitigation is discussed and key decisions required are made; and
ii. project reporting requirements will be fully defined, together with content requirements, target audience and timing.

Implementation of workstreams

10.35. There are a number of different workstreams for this project, and responsibilities and resources for each of these have been identified:

i. engineering design and technical studies;
ii. transport assessment and traffic modelling;
iii. business case and financial assessment;
iv. environmental assessment;
v. funding and procurement;
vi. contract management;
vii. commercial and legal;
viii. land assembly;
ix. risk management strategy;
x. monitoring and evaluation; and
xi. project management.

Section 11: Conclusions

Section summary:

- **The case for change is clear: the new London Overground stations at Old Oak would deliver regeneration, economic, housing and transport benefits to London, bringing better connectivity and better prospects not just to west London but London as a whole.**
- **The assessment of the new Overground stations at Old Oak has confirmed that there is potentially a positive business case for Old Oak Common Lane, either delivered in isolation or together with Hythe Road. The case for Hythe Road is less clear.**
- **The delivery timescale beyond 2017 is also not yet clear and a funding package must be sourced.**

11.1. The case for change is clear: delivering the OOOS, with two new London Overground stations at Old Oak with the HS2/Elizabeth line/National rail station in place, would deliver regeneration, economic, housing and transport benefits to London, bringing better connectivity and better prospects not just to west London but London as a whole. This is illustrated in Table 34 overleaf.

11.2. Delivering the OOOS, with two new London Overground stations at Old Oak with the HS2/Elizabeth line/National rail station in place, would deliver regeneration, economic, housing and transport benefits to London, bringing better connectivity and better prospects not just to west London but London as a whole. This is illustrated in Table 34.

Table 34: Summary of how each option aligns with the scheme objectives

Objectives	DS1: Old Oak Common Lane and Hythe Road	DS2: Hythe Road Only	DS3: Old Oak Common Lane Only
Transport Objective: Improve transport connectivity to the site and through interchange with HS2, Elizabeth line, and National rail services at the Old Oak Common HS2/Elizabeth line/National rail station	OOOS would create orbital links between N / W / SW London and the site along with new interchange opportunities with services available at the HS2/Elizabeth line/National rail station. OOOS could bring more people within an hour of Old Oak whilst also including links to other Opportunity Areas (OAs) and generating a transport user benefits of £500 million over the appraisal period.	Hythe Road would create orbital links between N / W / SW London and serve the demand for the planned developments at Old Oak. Of the three options, Hythe Road would generate the lowest transport user benefits of £200 million over the appraisal period.	Old Oak Common Lane would create orbital links between N / W / SW London and the site along with new interchange opportunities with services available at the HS2/Elizabeth line/National rail station. Old Oak Common Lane would generate a transport user benefit of £300 million over the appraisal period, making it the second best option amongst the three options.

Objectives	DS1: Old Oak Common Lane and Hythe Road	DS2: Hythe Road Only	DS3: Old Oak Common Lane Only
Regeneration Objective: Enhance the regeneration benefits that HS2/Elizabeth line/National rail services will bring to Old Oak	The new HS2/Elizabeth line/National rail station at Old Oak Common and the proposed London Overground stations will act as an enabler of growth in the immediate OA. The new stations could help facilitate large scale regeneration at Old Oak with up to 65,000 additional jobs and 25,500 homes created in the area. These benefits could be maximised by providing additional London Overground stations in the vicinity of the OA, which could increase the connectivity between railway services and creating more convenient connectivity to a wider range of destinations and providing access to a range of rail services for residents, occupiers and visitors within the regeneration area. The two stations would bring 200 additional housing units to the vicinity of the stations and would also generate 1510 Full Time Equivalent employment.	The new HS2/Elizabeth line/National rail station at Old Oak Common and the proposed Hythe Road station will act as an enabler of growth in the immediate OA. Hythe Road station would bring 120 additional housing units to the vicinity of the station and would also generate 710 Full Time Equivalent employment. The station and the viaduct of the station in particular, would enable the opportunity for more housing developments.	The new HS2/Elizabeth line/National rail station at Old Oak Common and the proposed Old Oak Common Lane will act as an enabler of growth in the immediate OA. Old Oak Common Lane would bring 80 additional housing units to the vicinity of the station and would also generate slightly more (800) Full Time Equivalent employment compared to Hythe Road station.

11.3. Financially, none of the three scenarios tested offer a position where revenue balances all costs to both DfT and TfL, however Old Oak Common station alone would deliver a funding surplus if capital costs are excluded.

11.4. The detailed programme beyond 2017 has not been confirmed due to uncertainties over funding and the completion of the OPDC masterplan. However, subject to funding being identified and the completion of the OPDC masterplan by summer 2018, an indicative programme to 2026 was provided.

11.5. The programme identifies that the earliest possible date for a Transport & Works Act Order (TWAO) submission would be 2020.

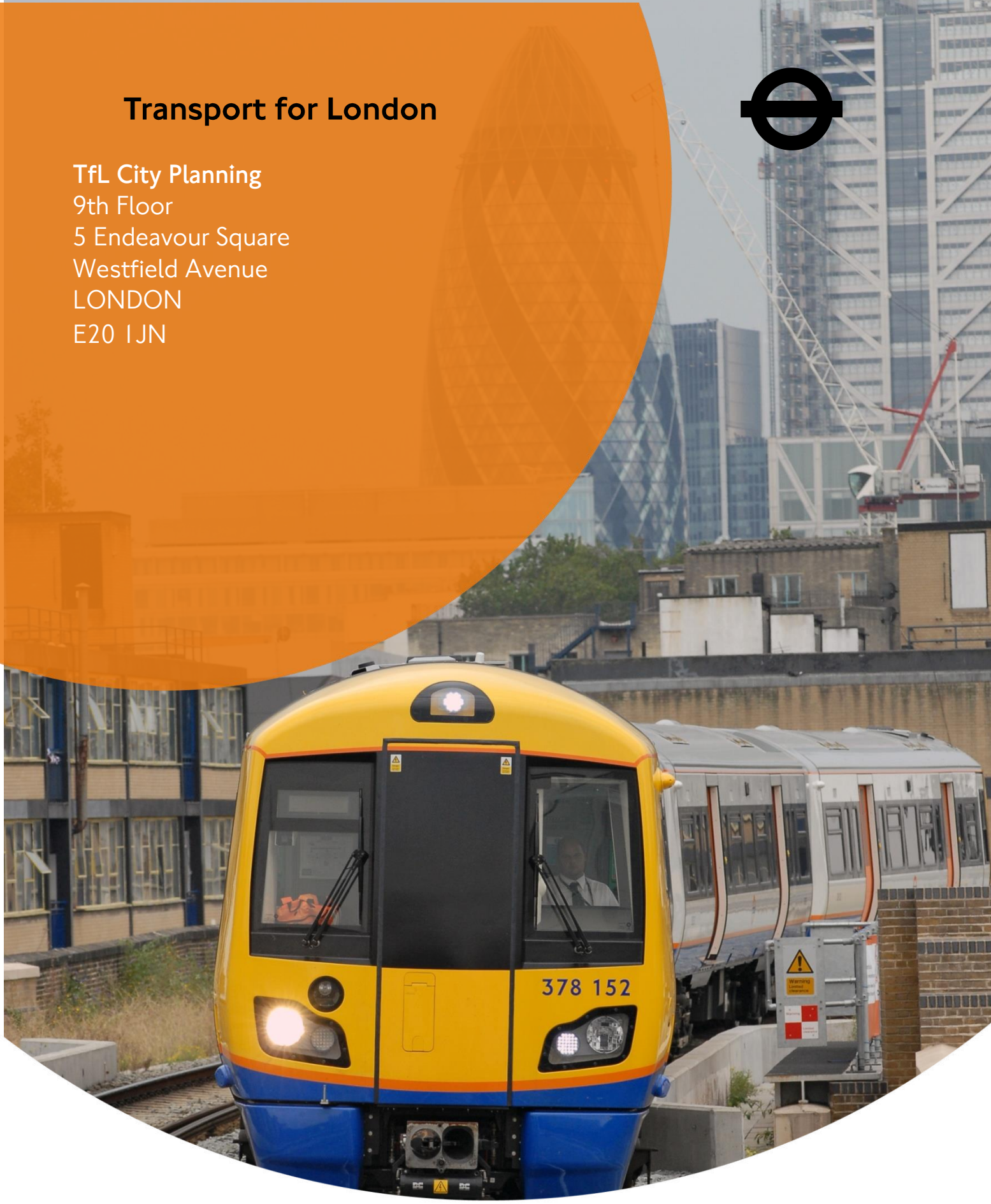
11.6. The infrastructure owner, Network Rail, is fully engaged with the project and the development of the stations has been undertaken in accordance with Network Rail' s GRIP process and they have provided 'Approval in Principle' (AiP) to the GRIP3 scheme design across all disciplines.

11.7. The procurement route for the next stage of project, through the development and submission of a TWAO and then on to the construction stage is yet to be confirmed, with a number of options under consideration.

11.8. If it was decided to progress Hythe Road station for delivery by 2023, then following TWAO approval a contractor could be appointed in 2021 with construction complete by 2023. The earliest likely date for delivery of Old Oak Common Lane station is 2026.

Transport for London

TfL City Planning
9th Floor
5 Endeavour Square
Westfield Avenue
LONDON
E20 1JN



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OVERGROUND

EVERY JOURNEY MATTERS