



West London Alliance

WEST LONDON ORBITAL RAIL SERVICE

Outline Case





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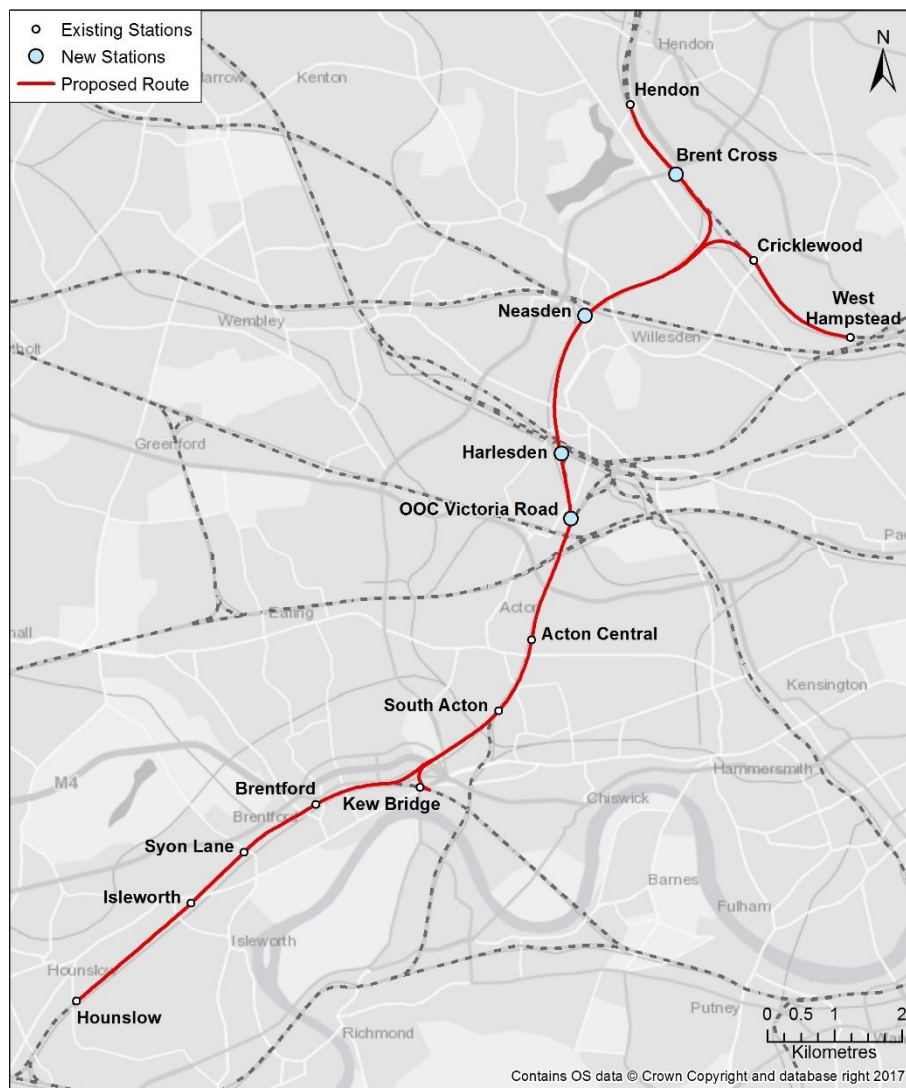
EXECUTIVE SUMMARY

BACKGROUND

The West London Alliance is currently investigating ways of accommodating the additional passenger demand resulting from the growth of population and employment in the area and across London as a whole. This includes substantial additional housing planned along much of the corridor between Hounslow and West Hampstead/Hendon. An option to serve these developments in a sustainable way, consistent with the draft Mayor's Transport Strategy ambitions, is to restore rail passenger services on the Dudding Hill Line and the Kew – Acton link to provide a West London Orbital (WLO) rail service from Hounslow to West Hampstead and Hendon.

This business case presents the findings from a study of the feasibility of introducing a West London Orbital rail service and identification and assessment of a preferred service option.

Figure 1 – Proposed West London Orbital Railway

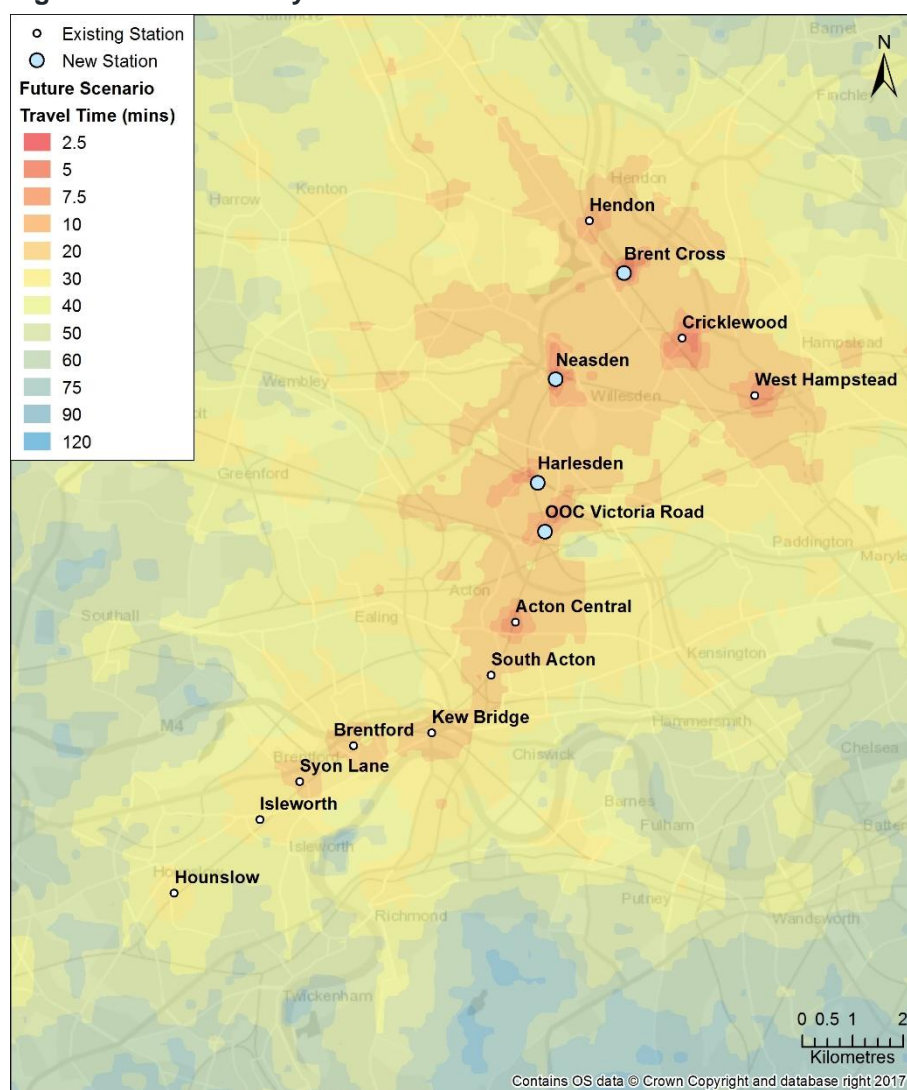


STRATEGIC CASE

The Strategic Case demonstrates the rationale for the development of a heavy rail solution for the Hounslow to West Hampstead/Hendon corridor given its existing role as a freight route and the opportunity to provide connectivity across the wider rail network. Retention of the heavy rail corridor on the Dudding Hill Line section will also permit integration of the WLO services into London Overground operations and to support the further success of this brand.

The introduction of a high quality orbital public transport service, integrated with the wider public transport network, will support the accommodation of forecast population and employment growth in West London in a manner consistent with the draft Mayor's Transport Strategy. The scheme will deliver significant connectivity and accessibility benefits by introducing new stations and new services. This will result in the attraction of existing public transport and highway users, as well as new users, contributing to relieving forecast crowding on LUL and national rail services, addressing highway congestion and supporting local environmental improvements. In doing so, it will play an important role supporting mode shift from car to more sustainable means of orbital transport for part of outer London that is currently heavily dependent on car use.

Figure 2 – Accessibility of new WLO stations



Within the areas benefitting from the significantly improved accessibility and connectivity are many sites and larger regeneration opportunities identified by boroughs. In addition to serving these sites and the associated

proposed housing and employment space, the introduction of WLO services will support an intensification of development facilitating increased numbers of housing units to be delivered on the sites.

A preferred rail service option has been identified based upon demand forecasting and operations and infrastructure analysis to support option development. The preferred option is:

- Phase 1:** 4 trains per hour from West Hampstead to Hounslow, calling at West Hampstead, Cricklewood, Neasden, Harlesden, Old Oak Common (OOC) Victoria Road, Acton Central, South Acton, Brentford, Syon Lane, Isleworth, Hounslow
- Phase 2:** additional 4 trains per hour from Hendon to Kew Bridge, calling at Hendon, Brent Cross, Neasden, Harlesden, OOC Victoria Road, Acton Central, South Acton, Kew Bridge

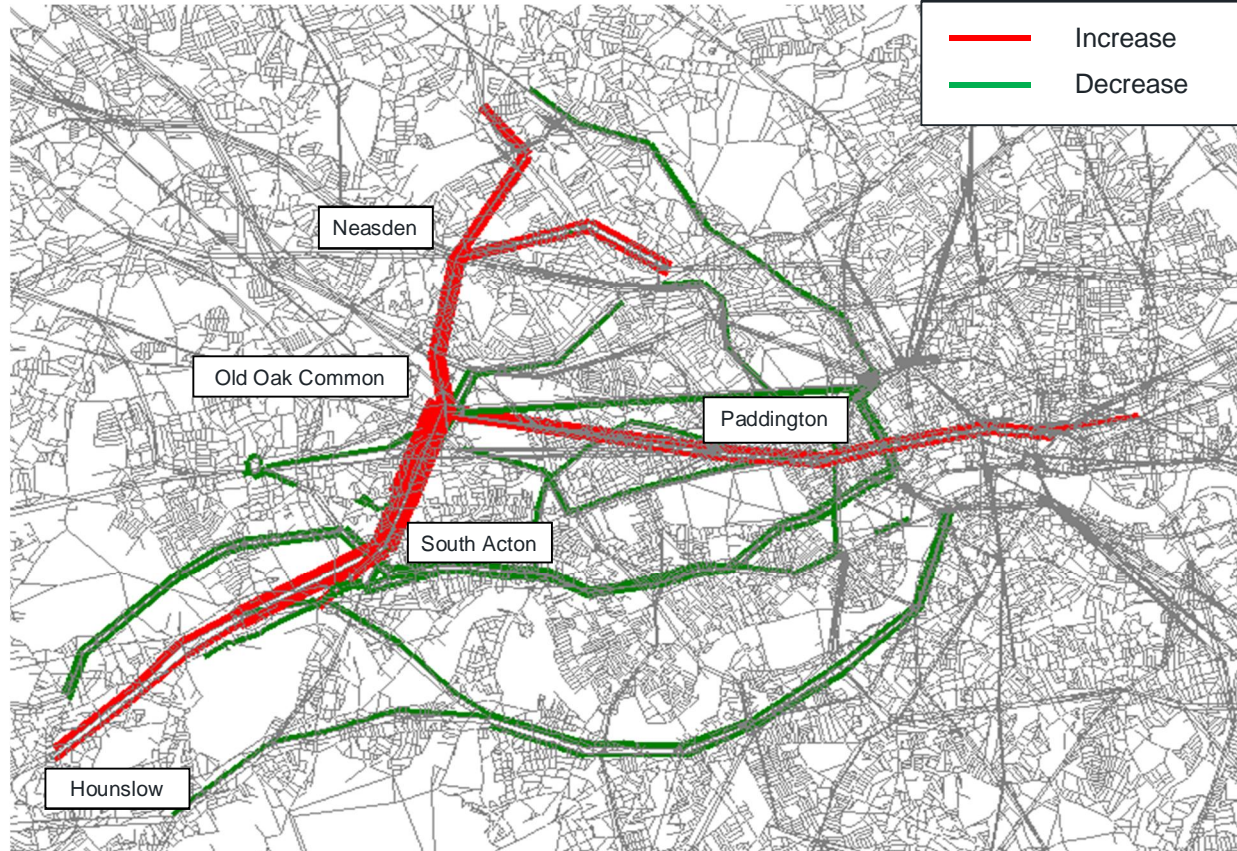
Phase 1 services are assumed to commence operation in 2026, with phase 2 services running from 2029.

ECONOMIC CASE

The Economic Case presents the economic appraisal of the value for money for the preferred option. The outputs from the preliminary demand modelling, along with capital and operating cost estimates, have been used as inputs for the economic appraisal. The appraisal has been undertaken in line with DfT guidance with the forecast benefits (from both quicker journey times and crowding relief in generalised time) for all London public transport users converted into monetary values (£47.77, £16.29 and £7.44 in 2041 prices for business, commuting and other trips respectively) to estimate the social benefits of the scheme.

The preferred option is forecast (as illustrated in Figure 3) to attract passengers from LUL lines such as the Northern, Jubilee, Central, District and Piccadilly as well as rail services currently operated by South West Trains and Great Western Railway. With the WLO passenger service operating these rail services are likely to witness lower levels of crowding, providing overall crowding relief to a broad range of other services. The direct connection between Old Oak Common Victoria Road station, which is considered as part of the WLO railway, and the main Old Oak Common station is estimated to attract additional passengers to the Elizabeth Line (Crossrail 1).

Figure 3 - Passenger flow difference for Preferred Option vs 2041 Maximum Growth Scenario (AM)



Given the significant levels of forecast passenger demand for the West London Orbital rail service (around 9,500 and 10,500 boarders in the AM and PM periods respectively in 2041) and the forecast journey time savings and crowding benefits across the wider public transport network (over 250,000 minutes and 600,000 minutes for the AM and PM periods respectively in 2041), the preliminary modelling suggests total social benefits exceeding £1.25bn PV over the 60-year appraisal period. Due to the constrained timescales of the study, it has not been possible to review base year LTS-PT model validation in the area of interest or undertake a detailed network audit. Therefore it is recommended that a thorough review and a possible improvement of the accuracy of the public transport model in line with TfL and DfT guidance in undertaken as part of future work.

The cost of delivering these benefits has been estimated for the capital and operating elements over the appraisal period. Together these amount to £596m PV (2010 prices). An annual revenue forecast of around £9m (current prices) for the WLO services has been estimated (as reported in the Financial Case), however for the purposes of this preliminary economic appraisal the revenue impact across the whole network is assumed to be neutral and is not included at the public transport network level. This is consistent with the results from the LTS-PT model, which is based on trip reassignment and hence largely a redistribution of revenue, e.g. from LUL to WLO. Further analysis of the operating position will be required.

The resulting indicative benefit to cost ratio (BCR) for the preferred WLO option is greater than 2:1, meeting the DfT's high value for money category. This strong BCR reflects the significant forecast benefits of the scheme to the wider economy and society through journey time savings and crowding benefits, and their realisation through better utilisation of existing infrastructure with selective capital investment, e.g. new platforms and four-tracking. Further analysis will be needed to refine this BCR.

Table 1 – Summary of Economic Appraisal Results

Item	60 year PV 2010
Journey time benefits	£684m
Crowding benefits	£614m
Total Benefits	£1,298m
Capital costs	£259m
Operating costs	£337m
Revenue	Assumed neutral at public transport network level
Net Financial Effect	£596m
Net Present Value	£703m
Benefit:Cost Ratio	2.2:1

Wider benefits are anticipated to accrue from additional demand resulting from the transfer of trips from road to rail (which is not captured in the demand modelling). This will benefit both those transferring and those who continue to use the roads, but experience less congestion. The reduction in congestion and vehicle-miles driven on the road will also provide environmental and social benefits, e.g. improved local air quality, reduction in road accidents.

FINANCIAL CASE

The Financial Case addresses the affordability of the delivery and operation of the proposed rail services. With a capital cost estimate of £263m (current prices, with 80% risk), significant funding will need to be secured to deliver the scheme. Initial analysis by the West London boroughs indicates that there is scope to derive a significant contribution towards this capital cost through funding from the Community Infrastructure Levy (CIL).

With potentially 15,000 to 20,000 new homes planned in West London the associated value of the CIL could approach around £150m-£200m.

As further scheme development is undertaken greater certainty will emerge over the level of funding required given the confirmation of infrastructure requirements, value engineering where appropriate and detailed quantified risk assessments. Further, through the identification of potential rail industry synergies, opportunities for cost efficiencies and rail industry funding can be explored.

It has been assumed that the proposed West London Orbital rail service will be operated as part of the London Overground network, with integration with the TfL fares and ticketing arrangements. Annual operating costs of around £15m (current prices) have been estimated for the proposed rail service. When set against the estimated annual farebox revenue of around £9m (current prices), based on the preliminary demand modelling results, this initial analysis suggests an operating subsidy would be required. Opportunities to meet the 'gap' will therefore need to be considered in order to confirm the affordability of West London Orbital rail service operations. This consideration should address:

- Future TfL fares' policy for orbital travel (e.g. premium fares), which is often lower than for equivalent radial journeys because they can be made without crossing fare boundaries
- Potential re-zoning of the London transport network, e.g. zoning Old Oak Common as Zone 1
- Opportunities to harness future technology for ticketing and fares to most effectively manage demand across the network and price fares appropriately
- Additional fare revenue received from demand transferring from road to rail, but not captured in the current demand forecasting (which is solely reassignment)
- Opportunities for commercial revenue streams through station and/or on-train commercial activities
- Future rolling stock choices, e.g. electric or battery, and implications for operating and whole-life costs
- Future operating practices, e.g. provision of ticket offices, staffing

COMMERCIAL & MANAGEMENT CASE

The Commercial & Management Case sets out the current thinking on the approach to manage and deliver the proposals for the West London Orbital rail service. To date, the project has been led by the West London Alliance, with representatives of the boroughs of Barnet, Brent, Ealing and Hounslow, along with Transport for London and Old Oak and Park Royal Development Corporation, represented on the project Steering Group.

With the demonstration in this business case of the robust strategic rationale for the scheme, its operational feasibility and the forecast significant social benefits that will result from the introduction of the West London Orbital rail service, further development of the project should be undertaken. The involvement of the entire rail industry will be necessary. Regardless of possible funding streams, the Department for Transport will need to be content with the proposal, and may suggest amendments to facilitate its implementation, in line with other network-wide schemes such as the Digital Railway. Network Rail will be a central player in the project management and delivery of the scheme, be it undertaking the work directly or with an asset protection role.

Given the current use of the route for freight, freight operators will be important parties to engage with and there will also be the interface with the South Western franchise's emerging service planning on the Hounslow loop to ensure that neither sets of plans are compromised. With its experience of planning and management of major transport investment in London and the synergy between the proposed West London Orbital service and the North and West London lines (London Overground), its role with many train operators in the London area and with the HS2 interface at Old Oak Common, Transport for London is best placed to provide project leadership as the scheme is progressed.

CONCLUSIONS

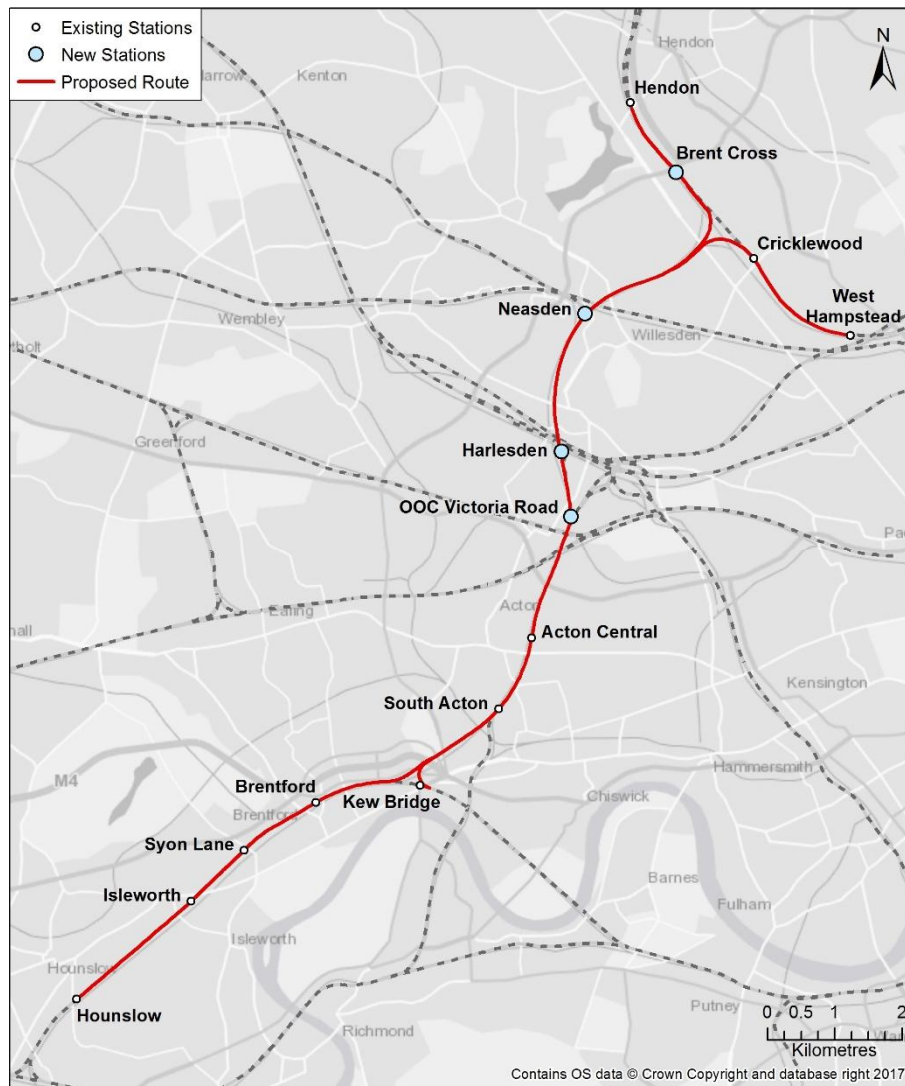
This business case demonstrates that significant economic, social and policy benefits will result from the introduction of WLO rail services due to the improved connectivity and accessibility provided on an important orbital route, as well as significant crowding relief on the wider public transport network. The delivery and operation of the services has been shown to be feasible with the key infrastructure challenges identified. These will require further work to confirm the identified solutions have stakeholder support and to refine the total level of funding required for the project. At this stage the study has identified plausible options for funding the construction of the line itself and for responding to any potential operating subsidy given its significant regeneration and economic benefits. These merit further more detailed technical analysis.

1 INTRODUCTION

1.1 BACKGROUND

- 1.1.1. The West London Alliance is currently investigating ways of accommodating the additional demand resulting from the growth of population and employment in the area and across London as a whole. This includes substantial additional housing planned along much of the corridor between Hounslow and West Hampstead/Hendon. An option to serve these developments in a sustainable way, consistent with the draft Mayor's Transport Strategy ambitions, is to restore passenger services on the Dudding Hill Line and the Kew – Acton link to provide a West London Orbital rail service from Hounslow to West Hampstead and Hendon.
- 1.1.2. The Dudding Hill Line is an existing railway line in north-west London running from Acton to Cricklewood. The line itself has had no scheduled passenger service for over a century. It has no stations, no electrification and a 30 miles per hour (48 km/h) speed limit with semaphore signalling, and is lightly used by freight and very occasional passenger charter trains. It is roughly 4 miles (6.4 km) long. Near the site of Old Oak Common, trains would join the existing North London Line, and then further south at Acton, use the link down to the Hounslow Loop to reach Brentford and Hounslow. We refer to this set of routes as the West London Orbital railway.

Figure 4 – Proposed West London Orbital Railway



- 1.1.3. WSP was commissioned to carry out a feasibility study into the case for introducing a new passenger service using the West London Orbital railway. The study addressed the strategic options for the route, forecast passenger demand and undertook operational and infrastructure analysis. A series of technical notes were produced documenting the study approach and findings. These have been collated into a technical report – *'West London Orbital Rail: Technical Analysis and Conclusions'*.

1.2 FIVE-CASE BUSINESS CASE

- 1.2.1. This document is based on the work undertaken for the feasibility study. This document presents the study's findings against the five-case business case structure set out by HM Treasury (*'Green Book Supplementary Guidance'* (2013)) and the Department for Transport (*'The Transport Business Cases'* (2013)).
- 1.2.2. This business case focuses on the emerging strategic and economic case for the proposals, in line with WebTAG Stage 1 – Option Development. It presents the case for the intervention and the identification and assessment of options to identify the better performing one to be taken forward for further development and appraisal work. Given the early stage of the project and the associated uncertainty at this time regarding the affordability of the proposals and the delivery model to implement them, current emerging thinking is set out demonstrating the plausibility of successfully delivering the scheme, but recognising that further work is required.
- 1.2.3. The structure of this document follows the five-case business case model (with the Commercial and Management Cases combined):
- i Chapter 2 - The **Strategic Case**: setting out the context and the case for change, including the identification of the preferred option;
 - i Chapter 3 - The **Economic Case**: assessing the preferred option in terms of the scheme costs and the arising benefits to society (value for money);
 - i The **Financial Case**: identifying the scheme's affordability and potential funding arrangements over the lifespan of the project; and
 - i Chapter 4 - The **Commercial & Management Case**: considering the commercial viability of the scheme's delivery and operation and the proposed model for leading the project forward.

2 STRATEGIC CASE

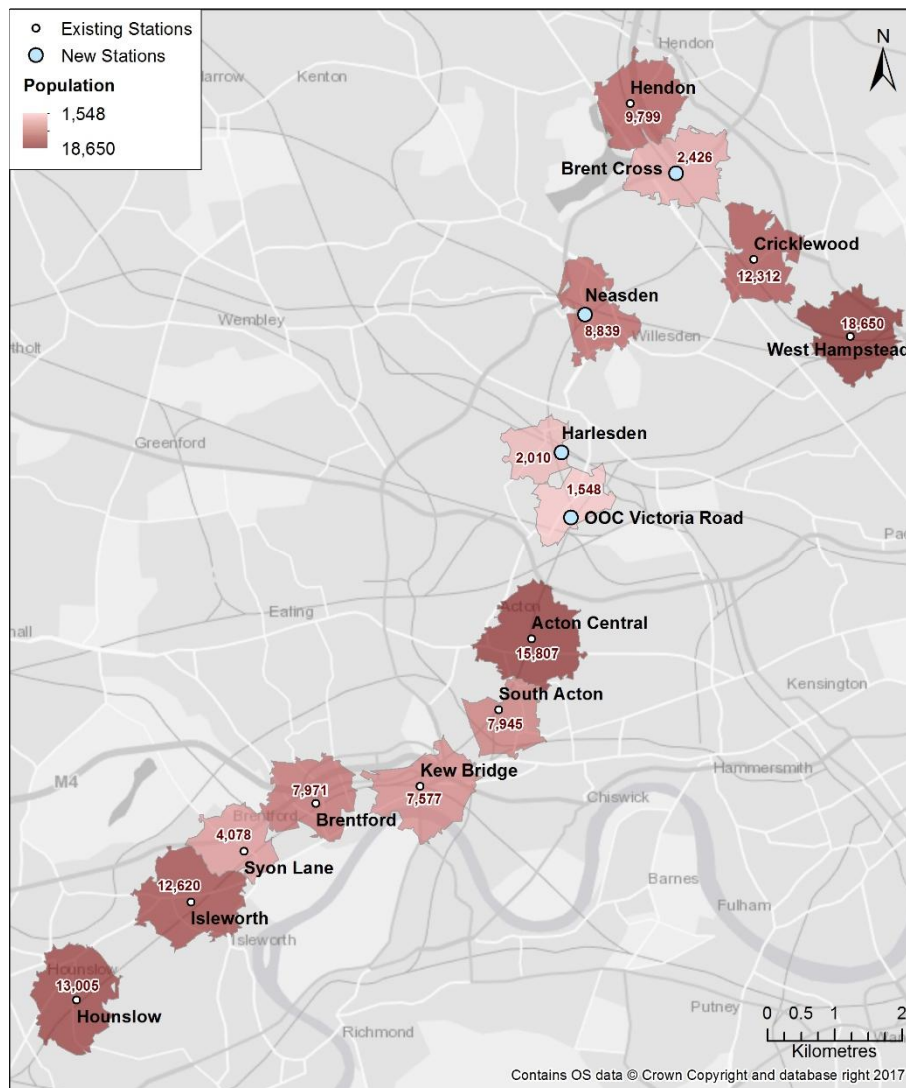
2.1 INTRODUCTION

2.1.1. The Strategic Case demonstrates the rationale for the development of a heavy rail solution for the Hounslow to West Hampstead/Hendon corridor. The proposed West London Orbital rail service will provide a high quality orbital public transport service, integrated with the wider public transport network. In doing so it will address a missing 'link' in the orbital rail network, support the accommodation of forecast population and employment growth in West London and align with the ambitions set out in the draft Mayor's Transport Strategy.

2.2 STRATEGIC RATIONALE

2.2.1. The West London Orbital rail service will deliver significant connectivity and accessibility benefits by introducing new stations and new services in West London along a currently under-utilised corridor. Figure 5 illustrates the current extent of the walk-in catchments and the population resident within the catchment who will benefit from the new service. These catchments will increase significantly with the forecast growth in population and housing in West London.

Figure 5 – Current Catchment Population along WLO Railway



2.2.2. Within the areas benefitting from the significantly improved accessibility and connectivity are many sites and larger regeneration opportunities identified by boroughs. In addition to serving these sites and the associated

proposed housing and employment sites, the introduction of WLO services will support an intensification of development facilitating increased numbers of housing units to be delivered on the sites

- 2.2.3. The resulting demand growth for both the public transport and highway network will impose increased costs on individuals and the economy, in terms of congestion and environmental and social dis-benefits in the absence of investment in additional capacity. The draft Mayor's Transport Strategy states that without action, by 2041 71% of travel in the morning peak on London Underground will be in crowded conditions. The respective figure for National Rail is 65%.
- 2.2.4. Delivery of the West London Orbital rail service will support the vision set out in the draft Mayor's Transport Strategy to reduce the need for car use (including taxis and private hire vehicles) in London to 20% by 2041 compared with 36% currently, which is largely due to the levels of car use in Outer London. The new rail service will also support sustainable development and provide the capacity required for the public transport network.

2.3 STRATEGIC OPTIONS

DUDDING HILL LINE

- 2.3.1. The Dudding Hill Line section of the West London Orbital railway is a 4-mile railway line between Cricklewood and Acton Wells. At the northern end connections are provided to the Midland Main Line, both to the north and south. At Acton Wells it joins the North London Line. From there, trains may proceed to the Great Western Main Line (Ealing), or continue along the North London Line towards Hounslow or Richmond. There are single-track link lines from the West Coast Main Line at Willesden and the Chiltern main line at Neasden.
- 2.3.2. The Dudding Hill Line is not an independent line: it links four main lines together, and by way of the North London Line, provides valuable links to the South Western network. It is an important freight artery, providing a means by which stone trains from the Mendips, for example, can operate to the West Coast or Midland Main Lines. While providing a corridor for freight, the Dudding Hill Line does not see any passenger services (either public transport or private vehicles). Passenger services last ran on the route in 1902.
- 2.3.3. The provision of passenger services would provide improved accessibility, support economic and housing growth along the corridor and relieve passenger demand on adjacent rail and highway networks. A high level consideration has been undertaken into the merit of seeking to utilise the existing heavy rail infrastructure or to replace the freight alignment with alternative transport facilities.

ASSESSMENT OF STRATEGIC OPTIONS

- 2.3.4. The strategic options considered for passenger services were: heavy rail, tram, tram-train, bus rapid transit and conversion to highway. Each of these was assessed against a multi-criteria sifting framework. The purpose of the framework was to support the differentiation between the options in order to inform the decision on the strategic option to proceed with. The framework was developed to enable a proportionate approach to be taken, cognisant of the information available and the stage of the project.
- 2.3.5. The framework addressed for each option, its:
 - ▮ Suitability: e.g. meeting the identified needs and objectives for the proposed scheme
 - ▮ Feasibility: e.g. delivery and operational issues
 - ▮ Acceptability: e.g. powers/consents, capital cost/affordability, stakeholder acceptability
- 2.3.6. Criteria for each of the above elements were determined and the performance of each option against them was assessed in comparison with the current situation as an improvement or detrimental and whether slight, moderate or significant.

ASSESSMENT FINDINGS

- 2.3.7. The findings of the high level assessment of the strategic options are summarised in the table below. The extent of the improvement or detriment has been assessed and illustrated with green indicating the greatest level of benefit and red the least (or a negative impact). The individual assessments are not additive, but should be considered on a comparative basis against other options and in the round for the overall assessment.

Table 2 – Summary of High Level Assessment of Passenger Service Strategic Options

	Heavy rail	Tram	Tram-train	Bus Rapid Transit	Conversion to road
<i>Suitability</i>					
Accommodation of additional demand	Green	Green	Green	Green	Green
Supporting housing agenda	Green	Yellow	Green	Yellow	Yellow
Supporting local economic growth	Green	Yellow	Green	Yellow	Yellow
Improved connectivity for West London	Green	Yellow	Green	Yellow	Green
Freight network performance	Yellow	Red	Yellow	Red	Red
<i>Feasibility</i>					
Construction	Green	Green	Green	Green	Green
Operational	Green	Green	Yellow	Green	Green
<i>Acceptability</i>					
Affordability	Yellow	Green	Green	Yellow	Yellow
Approvals	Green	Yellow	Yellow	Yellow	Red
Stakeholder acceptability	Green	Red	Yellow	Red	Red

- 2.3.8. While all the options, by enhancing the local transport network in West London, would contribute positively to the intent for the scheme, the greatest benefit is anticipated to arise from the heavy rail and tram-train options as they offer being part of the existing wider transport network (as does conversion to road), as well as providing the perceived permanency of fixed rails, which is attractive to developers, investors and the public due to the perceived greater value of these forms of public transport.
- 2.3.9. However, the most material differentiator between the heavy rail and tram-train options and the others is the ability of these passenger services to operate alongside the existing freight services on the line. With each of the other options freight movements could not take place on the line. The permanent diversion of freight services elsewhere does not appear feasible given geography and the utilisation of the rail network in the area. Constructing a new rail route for freight has been discounted due to deliverability and affordability challenges.
- 2.3.10. Freight trains under some very limited circumstances can share tracks with passenger trams, but there are onerous safety considerations to be addressed, which it may not be possible to satisfactorily overcome. A line not dissimilar to the Dudding Hill line in Paris, called the Tangentielle Nord line, has seen part of the former Grande Ceinture line re-used for trams. The French authorities have not closed the Grande Ceinture, which, like the North London Line, is an important freight artery, but have built a separate tram alignment next to it. A similar option for the Dudding Hill line might be possible, but it would require significant land-take, would be expensive and present engineering challenges (and therefore has not been assessed further).
- 2.3.11. The incompatibility between maintaining the existing freight services and introducing trams, bus rapid transit or a highway arguably indicates that none of these options is suitable for further consideration, notwithstanding that all the options are feasible in terms of construction and operation. The least confidence for operational feasibility relates to tram-train, which is still being trialled on the South Yorkshire rail network.
- 2.3.12. The findings for the assessment of acceptability reinforce the conclusions on suitability of the options. While introducing tram or tram-trains may provide a lower cost alternative to re-introducing heavy rail passenger services (and compared to having to remove the rails and lay a new carriageway for bus rapid transit or cars), their acceptability to stakeholders such as TfL, GLA, Network Rail, freight operators and local authorities is expected to be poor and hence achieving the necessary approvals would be very challenging. Similarly, given the policy context of the draft Mayor's Transport Strategy, the construction of a new road and transfer of freight from rail to road would be anticipated to also be opposed by key stakeholders.

- 2.3.13. In conclusion, having considered potential strategic options for the introduction of passenger services along the Dudding Hill Line, the findings from the high level assessment demonstrate that the line should remain part of the national rail network and not be a candidate for conversion to another mode. The retention of the Dudding Hill Line as a heavy rail line avoids the negative implications for freight and facilitates the realisation of benefits which the re-introduction of heavy rail passenger services has the potential to achieve, both in terms of transport connectivity and supporting the housing and economic growth agendas for the local areas. This conclusion was supported by the client group.

2.4 OPTION DEVELOPMENT

INTRODUCTION

- 2.4.1. Building on the conclusion of the strategic options assessment, a number of heavy rail passenger service options for the West London Orbital railway were defined. The option definitions were shaped by stakeholder contributions on the scheme requirements and priorities.
- 2.4.2. The three defined options were:
- **Option 1:** 4 trains per hour (tph) Hendon - Hounslow, calling at Hendon, Brent Cross, Neasden, Harlesden, Old Oak Common (OOC) Victoria Road, Acton Central, South Acton, Brentford, Syon Lane, Isleworth, Hounslow
 - **Option 2:** 4 tph West Hampstead - Hounslow, calling at West Hampstead, Cricklewood, Neasden, Harlesden, OOC Victoria Road, Acton Central, South Acton, Brentford, Syon Lane, Isleworth, Hounslow
 - **Option 3:** 4 tph West Hampstead - Hounslow and 4 tph Hendon - Hounslow, stops as above.
- 2.4.3. Consideration was given to the inclusion of a new station at Lionel Road, which is situated just east of Brentford and north of Kew Bridge stations. This proposal has been the subject of previous extensive work. This work suggests there is a good case for the station. However, we have excluded it from the options above because it is not integral to the re-opening of the line: the line could be re-opened and perform well without Lionel Road station. If the new station was constructed it would further increase the local regeneration benefits resulting from improved local rail services.
- 2.4.4. Demand forecasting, as described below, was undertaken for each of the options. A review of the infrastructure and operating requirements for introducing each of the options was also completed. The findings from both these analyses shaped the definition of the preferred option for further assessment.

DEMAND FORECASTING APPROACH

- 2.4.5. TfL's LTS-PT model was used to provide a preliminary forecast of the implications of the passenger service options. LTS-PT is a public transport model which covers the whole of London and predicts the demand by public transport mode (rail, underground, bus) and route that a person chooses to get to their destination, as well as the associated crowding impacts. The software platform for LTS-PT is Cube Voyager.
- 2.4.6. Travellers in London may respond in a number of different ways when they are faced with the introduction of a new passenger service including:
- Change their route to benefit from a faster and possibly less crowded passenger service;
 - Change the destination of some trips;
 - Change mode of travel, for example from road to rail; and
 - Change the number of trips (trip generation and trip suppression).
- 2.4.7. Some of these responses will be more profound than others and TfL has a suite of models (LTS, HAM, LTS-PT) to assess all the above mentioned responses. However, at this stage of the project and to provide an initial indication of the demand on the re-introduced service, only the re-routing response has been assessed. This is considered to be the strongest response to the introduction of a new passenger service in London.
- 2.4.8. As a reassignment model of public transport demand LTS-PT does not capture the transfer from private cars or induced demand growth, both of which we would expect to play a substantial role in a West London Orbital passenger service. As such, the results presented here are almost certainly underestimated.
- 2.4.9. Given the constrained timescales of the study, it was not possible to review base year LTS-PT model validation in the area of interest or undertake a detailed network audit. Therefore it is recommended that a thorough review and a possible improvement of the accuracy of the public transport model in line with TfL and DfT guidance in undertaken as part of future work.

2.4.10. The passenger service options were tested against the following baselines:

- i Standard LTS-PT 2041 Reference Case Scenario (A141rc01a)
 - This scenario includes HS2, but not Old Oak Common (OOC) or Brent Cross development.
- i 2041 Maximum Growth Scenario without Crossrail 2 (A141rc20a)
 - This scenario includes HS2 and additional trips associated with OOC and Brent Cross development, as well as other additional development across London. Given the commitment to these developments (e.g. the planned breaking ground for Brent Cross next year) this is deemed more representative of the anticipated scenario for West London in 2041.

2.4.11. The 2041 Reference Case Scenario and 2041 Maximum Growth Scenario networks are the same, but the demand matrices are different. The assessment was undertaken for the AM (0700-1000) and PM (1600-1900).

2.4.12. The introduction of West London Orbital passenger services is forecast to result in an increase in passenger kilometres, passenger minutes and total passenger boardings on rail services (including WLO). The results for Option 1 and Option 2 are similar. However, Option 3 (8 tph rather than 4 tph) is forecast to make a more significant impact on the rail network with the changes almost double of those for Option 1 or Option 2. For example, against the Reference Case in 2041 AM Option 1 is forecast to result in 5,556 additional rail boardings, Option 2 – 5,002 boardings and Option 3 – 12,834 boardings.

DEMAND FORECASTS

2.4.13. Table 3 presents the summary statistics across all public transport modes in London for the incremental effect of the three options compared to the Reference Case.

Table 3 – Summary statistics: WLO Options versus 2041 Reference Case Scenario

Mode	Peak	Description	2041 TfL Ref Case	Change in user benefits		
		Scenario	A141rc01a	Option 1 minus Ref. Case	Option 2 minus Ref. Case	Option 3 minus Ref. Case
All PT	AM	Passenger Kms	85,795,810	-25,424	-22,445	-35,614
		Uncrowded Passenger Minutes	115,348,652	-88,989	-77,060	-178,966
		Crowded Passenger Minutes	154,400,839	-241,381	-210,768	-316,253
		Passenger Boardings	6,244,762	-1,957	-2,121	-1,605
	PM	Passenger Kms	89,635,043	-21,387	-17,409	-30,172
		Uncrowded Passenger Minutes	120,021,714	-82,387	-70,612	-147,691
		Crowded Passenger Minutes	154,108,212	-219,549	-190,719	-387,404
		Passenger Boardings	6,791,486	-2,268	-2,350	-1,779

- 2.4.14. The reduction in passenger kilometres, passenger minutes and total passenger boardings on LUL and buses indicates that the demand for the West London Orbital services is likely to be abstracted from LUL and bus services, providing crowding relief for them.
- 2.4.15. The WLO services are anticipated to improve connectivity and provide extra capacity on the public transport network in London resulting in lower levels of distance travelled, total boardings, journey times and crowding levels, most notably in the north-western and south-western quadrants of London. The impact of Option 1 and Option 2 is estimated to be very similar, with Option 3, which assumes double the number of trains on the core section, showing more significant changes.
- 2.4.16. When tested against the Maximum Growth scenario, the pattern of the results is similar as for the Reference Case scenario. However, the additional trip generation associated with the Maximum Growth Scenario means changes are greater, as summarised in Table 4.

Table 4 – Summary statistics: WLO Options versus 2041 Maximum Growth Scenario

Mode	Peak	Description	2041 Max Growth	Change in user benefits		
		Scenario		Option 1 minus Max Growth	Option 2 minus Max Growth	Option 3 minus Max Growth
All PT	AM	Passenger Kms	88,152,748	-26,651	-23,275	-37,204
		Uncrowded Passenger Minutes	118,927,182	-90,796	-78,050	-155,426
		Crowded Passenger Minutes	160,705,541	-242,933	-212,086	-447,184
		Passenger Boardings	6,485,584	-2,108	-2,262	-1,831
	PM	Passenger Kms	92,436,014	-22,333	-18,018	-32,261
		Uncrowded Passenger Minutes	124,289,369	-88,546	-75,299	-155,144
		Crowded Passenger Minutes	162,352,074	-252,329	-218,843	-436,387
		Passenger Boardings	7,068,359	-2,352	-2,443	-1,971

- 2.4.17. The introduction of West London Orbital passenger services is forecast to attract passengers from LUL lines such as the Northern, Jubilee, Central, District and Piccadilly as well as rail services currently operated by South West Trains and Great Western Railway. With the WLO passenger services operating, these national

rail services are likely to witness lower levels of crowding, providing overall crowding relief to a broad range of other services.

- 2.4.18. The direct connection between Old Oak Common (OOC) Victoria Road station, which is considered as part of the WLO railway, and the main Old Oak Common station is estimated to attract additional passengers to the Elizabeth Line (Crossrail 1).
- 2.4.19. In terms of line loading, station boardings and alightings, the demand analysis shows the following:

Baseline: Standard LTS-PT 2041 Reference Case Scenario

- In the AM (0700-1000) Option 1 is forecast to carry 6,064 passengers, Option 2 - 5,758 passengers and Option 3 - 12,646 passengers.
- In the PM (1600-1900) Option 1 is forecast to carry 6,337 passengers, Option 2 - 6,146 passengers and Option 3 - 13,437 passengers.
- The demand will vary by station with OOC Victoria Road being utilised the most. For example, in Option 1 in the AM 1,000 passengers are forecast to board the West London Orbital services and 2,823 to alight. In Option 2 these numbers are 952 and 2,479 passengers respectively and in Option 3 - 2,122 and 6,173 passengers.
- In the PM OOC Victoria Road demand is: Option 1 - 2,036 boarders and 1,579 alighters, Option 2 - 1,889 and 1,478, Option 3 - 4,984 and 3,346. The majority of these passengers are those interchanging from/to the Elizabeth Line (Crossrail 1).

Baseline: 2041 Maximum Growth Scenario without Crossrail 2

- In the AM (0700-1000) Option 1 is forecast to carry 6,243 passengers, Option 2 - 5,920 passengers and Option 3 - 12,943 passengers.
- In the PM (1600-1900) Option 1 is forecast to carry 6,659 passengers, Option 2 - 6,437 passengers and Option 3 - 13,992 passengers.
- In the Maximum Growth Scenario WLO services are forecast to carry more passengers than in the Reference Case: on average 2.7% more in the AM and 4.6% in the PM.
- The demand estimates vary by station with OOC Victoria Road being utilised the most. For example, in Option 1 in the AM 1,100 passengers are forecast to board West London Orbital services and 2,772 to alight. In Option 2 these numbers are 1,045 and 2,428 respectively and in Option 3 - 2,342 and 6,022.
- In the PM OOC Victoria Road demand is: Option 1 - 2,036 boarders and 1,748 alighters, Option 2 - 1,884 and 1,618, Option 3 - 4,936 and 3,671. The majority of these passengers are those interchanging from/to the Elizabeth Line (Crossrail 1).

2.5 OPERATIONS AND INFRASTRUCTURE ANALYSIS

- 2.5.1. The feasibility of delivering the rail services tested in the demand analysis was assessed, along with the associated capital cost implications. The analysis built upon previous work by TfL, Network Rail and WSP (and is reported in full in the *'West London Orbital Rail: Technical Analysis and Conclusions'* report). The principal issues include:
- Construction of new stations at Harlesden and Neasden;
 - Construction of new platforms at Old Oak Common, Cricklewood, West Hampstead and Brent Cross;
 - Platform turnround capability at Hounslow;
 - Capacity between Hounslow and Key East junction given the proposed increased use of that route by the new South Western franchise;
 - Bollo Lane level crossings given the very substantial increase in use of the Kew - Acton line;
 - Capacity between Acton and Old Oak Common, especially around Acton Wells junction; and
 - Resignalling of Dudding Hill Line and Acton - Kew.
- 2.5.2. The conclusions of the analysis were that capacity could not be provided for eight trains an hour to Hounslow and therefore Option 3 would not be deliverable. While feasible the four-tracking around Acton Wells and identifying a satisfactory solution for the level crossings at Bollo Lane present the most significant challenges for implementation given the scheme requirements and the nature of the areas in which they will be constructed.

2.6 IDENTIFICATION OF PREFERRED SERVICE OPTION

- 2.6.1. Based on the demand forecasting and analysis of operational and infrastructure requirements for the three options, conclusions were drawn to inform the specification of the preferred option to be assessed. The conclusions were:
- i Option 3 (4 tph West Hampstead - Hounslow and 4 tph Hendon - Hounslow) attracts a higher level of demand and therefore higher total benefits (reduced passenger distance and passenger minutes) when compared with Option 1 (4 tph Hendon - Hounslow) and Option 2 (4 tph West Hampstead - Hounslow).
 - i Old Oak Common is central to the demand profile on the route, and it appears feasible to construct a station on the Dudding Hill lines at Brent Cross.
 - i With appropriate enhancements to the railway, which are assessed to be feasible, the assumed level of service can be accommodated, but providing in excess of 4 trains per hour to Hounslow, on top of the South West Trains service, is deemed prohibitively expensive.
 - i The preferred option should seek to deliver the benefits of option 3 (or as much of them as possible) for the most economical level of capital costs, e.g. a turnback at Kew Bridge and potentially with a phased introduction.
- 2.6.2. Based on these conclusions a preferred scenario was developed and agreed with the client group. The preferred option is specified as:
- i **Phase 1:** 4 trains per hour from West Hampstead to Hounslow.
 - i **Phase 2:** additional 4 trains per hour from Hendon to Kew Bridge.
- 2.6.3. Phase 1 services are assumed to commence operation in 2026, with phase 2 services running from 2029.

3 ECONOMIC CASE

3.1 INTRODUCTION

- 3.1.1. The Economic Case presents the economic appraisal of the value for money for the preferred option. The outputs from the demand modelling, along with the capital and operating cost estimates have been used as inputs for the economic appraisal. Alongside the quantified comparison of social benefits and the costs for the preferred option a qualitative consideration of wider benefits has been made.

3.2 DEMAND AND BENEFITS MODELLING

- 3.2.1. The LTS-PT model has been used to undertake preliminary demand and benefit forecasting for the preferred option, consistent with the initial options modelling.

Baseline: Standard LTS-PT 2041 Reference Case (A141rc01a)

- 3.2.2. The introduction of the new services is forecast to result in an increase in passenger kilometres, passenger minutes and total passenger boardings on rail services (including WLO) of 9,374 in the AM and 9,327 in the PM. A reduction in passenger kilometres, passenger minutes and total passenger boardings on LUL and buses indicates that the demand for the West London Orbital services is likely to be abstracted from LUL and bus services, providing crowding relief for them.
- 3.2.3. The new services are estimated to improve connectivity and provide extra capacity on the public transport network in London resulting in lower levels of distance travelled, total boardings, journey times and crowding levels, most notably in the north-western and south-western quadrants of London. The table below provides a summary across all public transport modes in London.

Table 5 – Summary statistics: WLO Preferred Option versus 2041 Reference Case Scenario

Mode	Peak	Description	2041 TfL Ref Case	Change in user benefits
		Scenario	A141rc01a	Preferred Option minus Reference Case
All PT	AM	Passenger Kms	85,795,810	-33,096
		Uncrowded Passenger Minutes	115,348,652	-140,143
		Crowded Passenger Minutes	154,400,839	-317,792
		Passenger Boardings	6,244,762	-1,827
	PM	Passenger Kms	89,635,043	-26,986
		Uncrowded Passenger Minutes	120,021,714	-119,500
		Crowded Passenger Minutes	154,108,212	-308,646
		Passenger Boardings	6,791,486	-1,913

Baseline: 2041 Maximum Growth Scenario without Crossrail 2

- 3.2.4. When tested against the Maximum Growth Scenario, the pattern of the results is similar as for the Reference Case Scenario. However, the additional trip generation associated with the Maximum Growth Scenario means changes are greater as summarised in Table 6.

Table 6 – Summary statistics: WLO Preferred Option versus 2041 Maximum Growth Scenario

Mode	Peak	Description	2041 Max Growth	Change in user benefits
		Scenario	A141rc01a	Preferred Option minus Max Growth
All PT	AM	Passenger Kms	88,152,748	-34,613
		Uncrowded Passenger Minutes	118,927,182	-129,397
		Crowded Passenger Minutes	160,705,541	-370,356
		Passenger Boardings	6,485,584	-2,010
	PM	Passenger Kms	92,436,014	-28,444
		Uncrowded Passenger Minutes	124,289,369	-126,955
		Crowded Passenger Minutes	162,352,074	-351,499
		Passenger Boardings	7,068,359	-2,028

- 3.2.5. As with the initial options, the preferred option is forecast (as illustrated in Figure 6) to attract passengers from LUL lines such as the Northern, Jubilee, Central, District and Piccadilly as well as rail services currently operated by South West Trains and Great Western Railway. With the WLO passenger services operating these rail services are likely to witness lower levels of crowding, providing overall crowding relief to a broad range of other services.
- 3.2.6. The direct connection between Old Oak Common (OOC) Victoria Road station, which is considered as part of the WLO railway, and the main Old Oak Common station is estimated to attract additional passengers to the Elizabeth Line (Crossrail 1). However, the number of passengers transferring at OOC between the WLO services and the Elizabeth Line drops by around 25% in comparison with Option 3 as the WLO Hounslow-Hendon service gets truncated to Kew Bridge providing a less frequent connection to/from Hounslow.

Figure 6 – Passenger flow difference for Preferred Option vs Maximum Growth Scenario (AM)



3.2.7. In terms of line loading, station boardings and alightings, the demand analysis shows the following:

Baseline: Standard LTS-PT 2041 Reference Case (A141rc01a)

- The WLO services are forecast to carry 9,504 passengers in the AM (0700-1000) and 10,165 passengers in the PM (1600-1900).
- The demand will vary by station with OOC Victoria Road being utilised the most. For example, in the AM 1,537 passengers are forecast to board the West London Orbital services and 4,660 to alight. In the PM these numbers are 3,917 and 2,428 passengers respectively. The majority of these passengers are those interchanging from/to the Elizabeth Line (Crossrail 1).

Baseline: 2041 Maximum Growth Scenario without Crossrail 2

- The WLO services are forecast to carry 9,758 passengers in the AM (0700-1000) and 10,623 passengers in the PM (1600-1900).
- In the Maximum Growth Scenario WLO services are forecast to carry more passengers than in the Reference Case: on average 2.7% more in the AM and 4.5% in the PM.
- The demand will vary by station with OOC Victoria Road being utilised the most. For example, in the AM 1,682 passengers are forecast to board the WLO services and 4,593 to alight. In the PM these numbers are 3,916 and 2,669 passengers respectively. The majority of these passengers are those interchanging from/to the Elizabeth Line (Crossrail 1).

3.3 COST ESTIMATES

CAPITAL COST ESTIMATE

- 3.3.1. The capital cost estimate for the preferred option was developed following a review of a number of studies which have been completed over the last few years for sections of the West London Orbital railway, including those by TfL and Network Rail. The review considered both the assumptions made for the infrastructure requirements and the previously proposed costs.

Table 7 – Summary of Capital Cost Estimate

Item	Spot cost (2017 prices)
West Hampstead 2 new platforms (4-car)	£1m
Cricklewood 2 new platforms (4-car)	£5.5m
Hendon 2 new platforms (4-car)	£1m
Brent Cross new platforms (4-car)	£5m
Neasden new station (4-car)	£18m
Harlesden new station (4-car)	
OOO Victoria road new platforms (4-car)	
Re-signalling of Dudding Hill line and Acton - Kew	£8m
Quadrupling of Acton Wells Junction area	£45m
Bollo Lane level crossing replacement	£30m
Acton level crossing	£5m
Kew Bridge or Lionel Road turnback	£4m for each
Old Kew Junction doubling	£4.6m
Old Kew Junction flyover	£8.5m
Hounslow bay platform	£5.4m
Depot facilities	£5m
Total	£146m

OPERATING COST ESTIMATE

- 3.3.2. Forecast operating costs were estimated on the basis of consistency with standard industry assumptions. They are estimated to be (in current prices):

- £8.611m p.a. for Phase 1 from 2026
- £15.247m p.a. for the full service from 2029

3.4 ECONOMIC APPRAISAL (BCR)

- 3.4.1. The economic appraisal was undertaken in line with DfT guidance (WebTAG). The forecast benefits (from both quicker journey times and crowding relief in generalised time) for all London public transport users was converted into monetary values based upon DfT's values of time for rail users in work time (£47.77 in 2041), for commuting (£16.29) and other (7.44) journey purposes.
- 3.4.2. The forecast benefits were profiled over a 60-year appraisal period from 2026 to 2085. The profiling captures:
- Value of time growth (from WebTAG)
 - Background demand growth to 2041 (from LTS-PT model)
 - Build-up factor of 50% in years 2026-2028 prior to introduction of 8 tph services from 2029
 - Discounting at 3.5% for next 30 years and then at 3%

- 3.4.3. Substantial benefits are forecast to arise from the journey time improvements provided by the new service, notably by accessing the Elizabeth Line at OOC Victoria Road and for journeys within the corridor which cannot currently be made directly (with travel time savings of up to 20 to 30 minutes). In total the preliminary value of the travel time benefits for the appraisal period exceed £680m PV (2010 prices) for both the Reference Case and Max Growth Scenario.
- 3.4.4. In addition, very significant benefits are forecast to be experienced not only by those using the WLO rail service, but by those experiencing less crowded travel conditions on other routes on the rail network. In total the preliminary value of the crowding relief benefits for the appraisal period exceed £600m PV (2010 prices) for the Max Growth Scenario and approach £500m PV (2010 prices) for the Reference Case.
- 3.4.5. Set against these social benefits (i.e. economic welfare) are the costs of the scheme, both capital and operating. In line with appraisal practice, an optimism bias uplift has been applied to the capital costs reflecting the early stage of scheme development. It is assumed that there will be real growth inflation on the capital costs of 1% per annum until scheme opening. This produces a discounted capital cost estimate for the appraisal of £259m PV (2010). For the operating costs 1% real growth inflation (in line with revenue) has been assumed. Over the life of the appraisal period the total operating cost is estimated to be £337m PV (2010).
- 3.4.6. An annual revenue forecast of around £9m (current prices) for the WLO services has been estimated (as reported in the Financial Case), however for the purposes of this preliminary economic appraisal the revenue impact across the whole network is assumed to be neutral and is not included at the public transport network level. This is consistent with the results from the LTS-PT model, which is based on trip reassignment and hence largely a redistribution of revenue, e.g. from LUL to WLO.
- 3.4.7. The resulting indicative benefit to cost ratio (BCR) for the preferred WLO option is greater than 2:1, meeting the DfT's high value for money category. This strong BCR reflects the significant forecast benefits of the scheme to the wider economy and society through journey time savings and crowding benefits, and their realisation through better utilisation of existing infrastructure with selective capital investment, e.g. new platforms and four-tracking. Further analysis will be needed to refine this BCR.

Table 8 – Summary of Economic Appraisal Results: Max Growth Scenario

Item	60 year PV 2010
Journey time benefits	£684m
Crowding benefits	£614m
Total Benefits	£1,298m
Capital costs	£259m
Operating costs	£337m
Revenue	Assumed neutral at public transport network level
Net Financial Effect	£596m
Net Present Value	£703m
Benefit:Cost Ratio	2.2:1
<i>For the Reference Case the BCR is 2.0:1.</i>	

3.5 WIDER BENEFITS

ACCESSIBILITY

- 3.5.1. Through the provision of new direct high quality public transport links and integration with the wider national rail network and LUL network, the introduction of the WLO rail service will deliver a step change in accessibility to and from the corridor between Hounslow and West Hampstead/Hendon.

- 3.5.2. Figures 7 and 8 illustrate the extent of the catchments for the new stations by time band in the 'with' and 'without' scenarios for the new service. As can be seen, the introduction of the WLO rail service significantly increases the areas accessible within 'reasonable' travel times (e.g. within 20 and 30 minutes) of these currently under-served locations.
- 3.5.3. Figure 9 shows the walk-in catchment for each of the stations served by the proposed services. It also presents the PTAL score for each station location in the absence of the scheme. The majority of the stations are scored as 3 or 4. (It should be noted that the baseline does not fully capture the large scale development around Old Oak Common, due to the forecast year available. It is therefore anticipated that the eventual baseline PTAL for the Old Oak Common (Victoria Road) will be considerably higher than shown in this analysis).
- 3.5.4. PTAL is a standardised measure used by TfL, which combines information about the proximity of public transport services and the morning peak frequencies. The PTAL scores have been produced from WebCAT PTAL output, which takes the closest point to the station. As this can be up to 100m from the platforms or station entrance, a manual adjustment was made. Figure 10 shows the effect on the PTAL score of introducing the scheme.

Figure 7 – Accessibility in Without WLO Rail Service Scenario

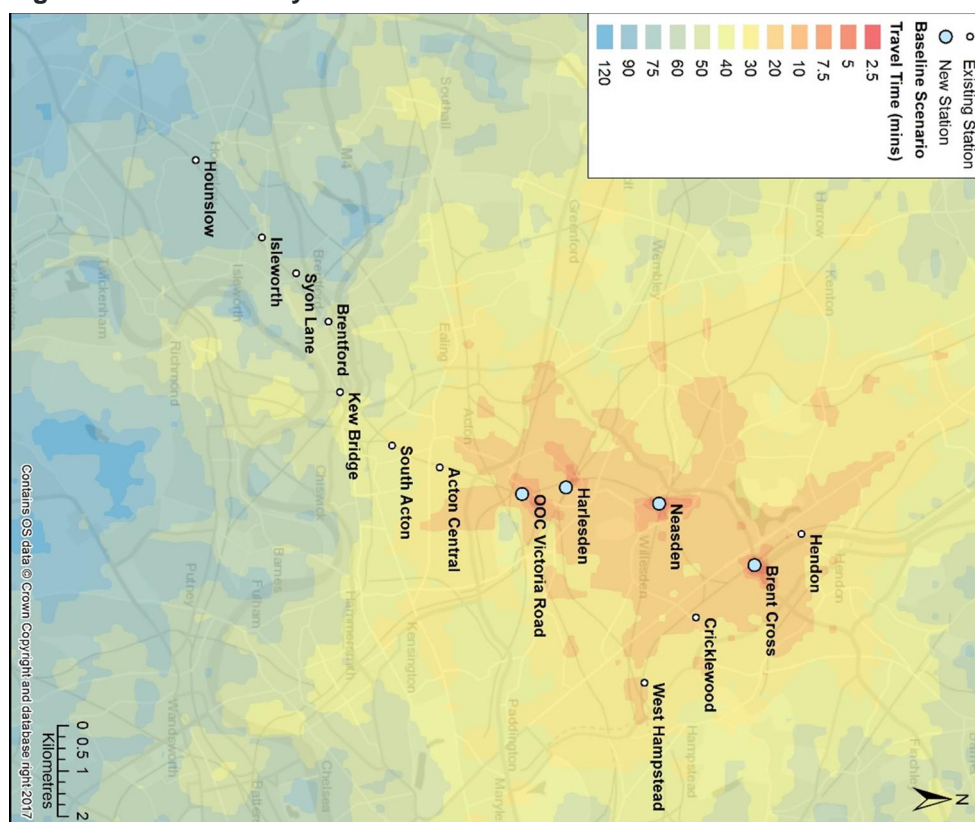


Figure 8 – Accessibility in With WLO Rail Service Scenario

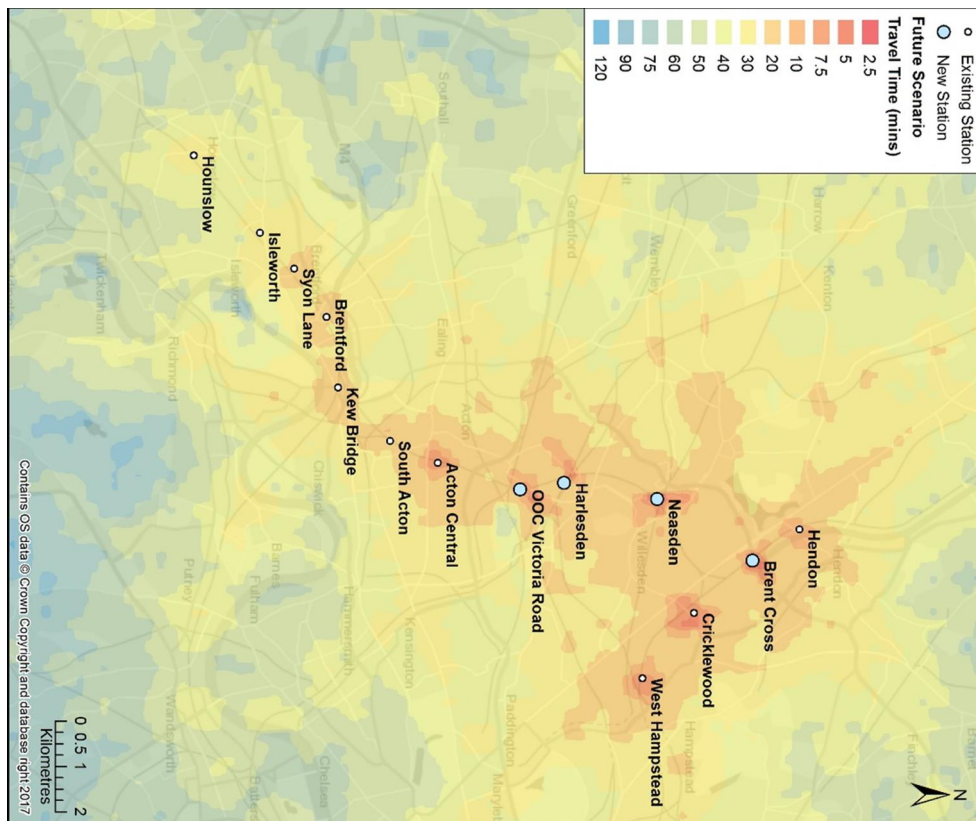


Figure 9 – PTAL Scores Without WLO Rail Service

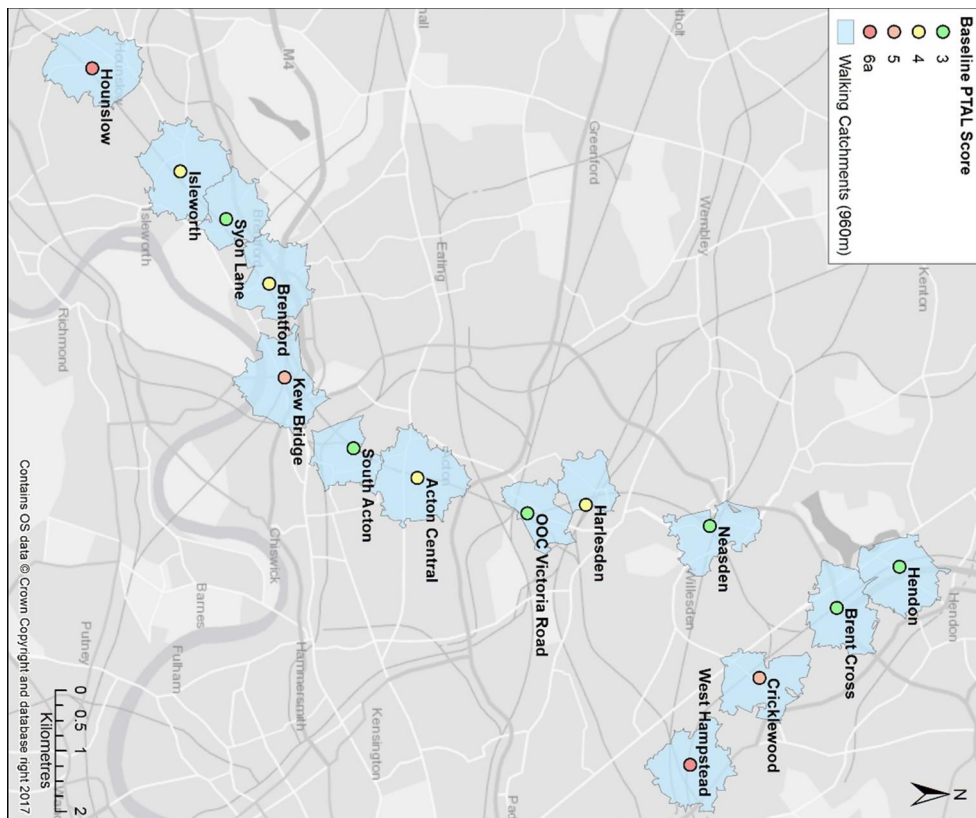
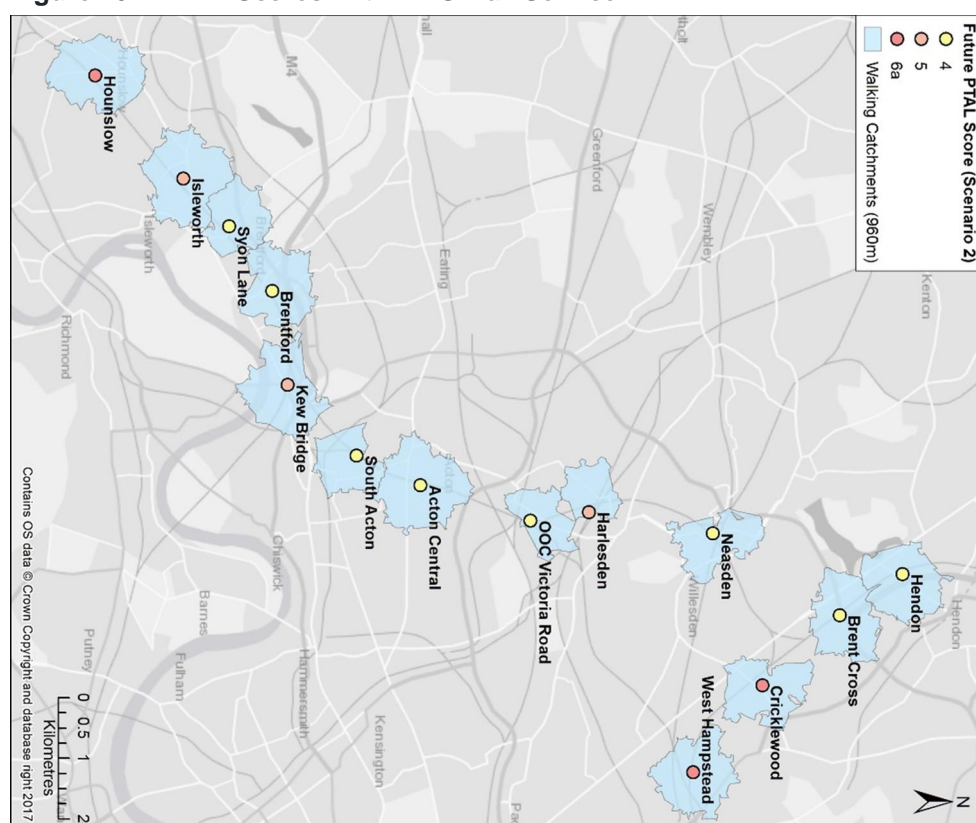


Figure 10 – PTAL Scores With WLO Rail Service



- 3.5.5. The results of the PTAL analysis illustrated in Figures 9 and 10 demonstrate an increase in score for nine of the 14 stations. All six of the stations with a score of 3 without WLO rail services gain a score of 4 after its introduction. Both Isleworth and Harlesden stations are promoted to a score of 5.

TACKLING HIGHWAY CONGESTION

- 3.5.6. The significant improvement in accessibility within and to and from the corridor will attract users from both the existing public transport network and the highway network. While at this stage of scheme development the demand modelling has not considered mode transfer, it is anticipated that given much greater journey time competitiveness with highway trips and potential journey time savings, particularly in the peak period, this will be significant. This will contribute to addressing current congestion on both orbital routes such as the A406 North Circular, A5 and Hendon Way and, given the attractiveness of the interchange at OOC Victoria Road with the Elizabeth Line, for radial routes such as the Westway and A4.
- 3.5.7. The provision of an attractive high quality public transport alternative to highway trips will also support the Mayor's ambition to reduce total traffic in London by 10-15% by 2041, as part of the Healthy Streets agenda, which includes addressing noise and air pollution and delivering local economic benefits.

SUPPORTING GROWTH

- 3.5.8. The demand forecasting and economic appraisal demonstrate the very significant benefits to the forecast public transport users in 2041, based on TfL's current assumptions. In West London there are ambitions to deliver additional significant housing and the provision of high quality public transport and good accessibility is seen as providing an opportunity to increase the density of developments and potentially open up new sites.
- 3.5.9. PTAL scores are used in the Housing Density Matrix in the London Plan to set out recommended housing densities for developments. As indicated in the extract from the London Plan below, (and assuming 'Urban' setting for West London), the range of expected densities around the stations served by the scheme (as shown in Figure 11) would increase to up to 700 habitable rooms per hectare and up to 260 units per hectare in the most accessible locations.

Figure 11 – Recommended Housing Densities in the London Plan

Setting	Public Transport Accessibility Level (PTAL)		
	0 to 1	2 to 3	4 to 6
Suburban	150-200 hr/ha	150-250 hr/ha	200-350 hr/ha
3.8-4.6 hr/unit	35-55 u/ha	35-65 u/ha	45-90 u/ha
3.1-3.7 hr/unit	40-65 u/ha	40-80 u/ha	55-115 u/ha
2.7-3.0 hr/unit	50-75 u/ha	50-95 u/ha	70-130 u/ha
Urban	150-250 hr/ha	200-450 hr/ha	200-700 hr/ha
3.8-4.6 hr/unit	35-65 u/ha	45-120 u/ha	45-185 u/ha
3.1-3.7 hr/unit	40-80 u/ha	55-145 u/ha	55-225 u/ha
2.7-3.0 hr/unit	50-95 u/ha	70-170 u/ha	70-260 u/ha
Central	150-300 hr/ha	300-650 hr/ha	650-1100 hr/ha
3.8-4.6 hr/unit	35-80 u/ha	65-170 u/ha	140-290 u/ha
3.1-3.7 hr/unit	40-100 u/ha	80-210 u/ha	175-355 u/ha
2.7-3.0 hr/unit	50-110 u/ha	100-240 u/ha	215-405 u/ha

Figure 2.1: Recommended housing densities in the London Plan

hr = habitable rooms
u = a dwelling unit, i.e. a flat or a house
ha = hectare

- 3.5.10. Assuming an increase in density around the stations where the PTAL score increased to 4 or above in the with WLO rail service scenario, the recommended increase in the number of units within the walk-in catchments of the stations could be around 200 units on the basis of the London Plan guidance. If the effect of the improved accessibility is extended to a one mile radius, the result could be over 300 additional units.
- 3.5.11. These indicative estimates however, are likely to be very conservative and developers will be keen to exploit the full commercial potential of the sites and seek to provide the highest densities they can. If this was to produce densities at some locations consistent with the 'Central' setting the level of additional units could approach around 1,000 units.
- 3.5.12. The above estimates are purely illustrative and do not reflect the current usage and densities in the areas which would benefit from the WLO rail service. Based on the emerging Strategic Housing Land Availability Assessments for the West London boroughs many identified sites will benefit from the introduction of the WLO rail service. This could potentially, subject to finalisation of site identification, developer appetite and local policies enable the intensification of housing development to potentially deliver 15,000 to 20,000 units in total.
- 3.5.13. The results of the demand forecasting indicate that in 2041 the WLO rail service will provide sufficient capacity to accommodate further significant growth in rail demand arising from further housing and employment development along the corridor.

4 FINANCIAL CASE

4.1 INTRODUCTION

- 4.1.1. The Financial Case addresses the affordability of the delivery and operation of the proposed rail services. At this stage plausible sources of funding to ensure the affordability of the scheme have been identified for further investigation.

4.2 FUNDING THE SCHEME CIL CONTRIBUTION

- 4.2.1. With a capital cost estimate of £263m (current prices, with 80% risk), significant funding will need to be secured to deliver the scheme. Initial analysis by the West London boroughs indicates that there is scope to derive a significant contribution towards this capital cost through funding from the Community Infrastructure Levy (CIL). With potentially 15,000 to 20,000 new homes planned in West London the associated value of the CIL could approach around £150m-£200m.

OPPORTUNITIES FOR OVER-SITE DEVELOPMENT

- 4.2.2. One potential way to support both the densification of development in the corridor and to raise funding to assist in addressing the scheme affordability is to pursue opportunities for over-site development (OSD) at the West London Orbital railway stations, which themselves are only likely to be cost effective if constructed to a material density.
- 4.2.3. A new station at OOC Victoria Road provides a good opportunity for a relatively dense OSD structure, along with increased public space and thoroughfare provision. This could complement the OPDC development masterplan. There may be opportunities at other stations, for example the new station at Harlesden offers limited potential for OSD, given its low density surroundings and lack of immediate proximity to an employment centre, but there is some space in the local area to enable a more ambitious vision when the future OPDC starts to regenerate the adjacent surroundings, so a longer-term masterplan could enable viable OSD.
- 4.2.4. The likely timescale for the delivery and operation of the WLO rail service, combined with TfL's ambitions for development of its sites via its Property Partnership Framework, would provide the ideal timing and climate in which to bring forward plans for new transport-oriented development and new or rejuvenated local centres.

RAIL INDUSTRY CONTRIBUTION

- 4.2.5. As further scheme development is undertaken greater certainty will emerge over the level of funding required given the confirmation of infrastructure requirements, value engineering where appropriate and detailed quantified risk assessments. Further, through the identification of potential rail industry synergies, opportunities for cost efficiencies and rail industry funding can be explored.

4.3 OPERATIONS AFFORDABILITY

- 4.3.1. For the purposes of this study it has been assumed that the WLO rail service would be operated as a London Overground concession. Indicative revenue has been estimated on the basis of assuming that all additional rail boarders forecast in LTS-PT provide a yield of £1 for WLO rail services recognising that many trips are likely to be 'discounted' due to the use of travelcards, season tickets, capped fares etc. and as legs of multi-legged journeys. This produces an estimated revenue when the 8 tph service has commenced operation of around £9m (in current prices). This compares to an operating cost estimate of around £15m.
- 4.3.2. The requirement for an operating subsidy is standard for much of the rail network, but further consideration of means to meet the 'gap' between the forecast revenue and operating cost will need to be considered in order to confirm the affordability of WLO rail service operations. This consideration should address:
- i Future TfL fares' policy for orbital travel (e.g. premium fares) which is often lower than for equivalent radial journeys because they can be made without crossing fare boundaries
 - i Potential re-zoning of the London transport network, e.g. zoning Old Oak Common as Zone 1
 - i Opportunities to harness future technology for ticketing and fares to most effectively manage demand across the network and price fares appropriately
 - i Additional fare revenue received from demand transferring from road to rail, but not captured in the current demand forecasting (which is solely reassignment)
 - i Opportunities for commercial revenue streams through station and/or on-train commercial activities

- | Future rolling stock choices, e.g. electric or battery, and implications for operating and whole-life costs
- | Future operating practices, e.g. provision of ticket offices, staffing

5 COMMERCIAL & MANAGEMENT CASE

5.1 INTRODUCTION

- 5.1.1. The Commercial & Management Case addresses the commercial viability of the proposals, namely their deliverability (beyond affordability, which is addressed in the Financial Case) and the associated approach to manage the project to successful completion. To date, the project has been led by the West London Alliance, with representatives of the boroughs of Barnet, Brent, Ealing and Hounslow, along with Transport for London (TfL) and Old Oak and Park Royal Development Corporation, represented on the project Steering Group.
- 5.1.2. With the demonstration in this business case of the robust strategic rationale for the scheme, its operational feasibility and the forecast significant social benefits that will result from the introduction of the West London Orbital rail service, further development of the project should be undertaken.

5.2 DELIVERING THE PROJECT

- 5.2.1. The involvement of the entire rail industry will be necessary to support the introduction of the West London Orbital rail service. Regardless of possible funding streams, the Department for Transport will need to be content with the scheme proposal and may suggest amendments to facilitate its implementation, in line with other network-wide schemes such as the Digital Railway.
- 5.2.2. Network Rail will be a central player in the project management and delivery of the scheme, be it undertaking the work directly or with an asset protection role. It is anticipated that the most challenging part of the programme is the 4-tracking of the Acton Wells area, and all parties will need to ensure that the design of the enhancement meets everybody's requirements (passenger and freight). Indeed, it may well prove beneficial to combine other works planned for the area into one programme. This will minimise disruption and potentially deliver financial savings.
- 5.2.3. Given the current use of the route for freight, freight operators will be important parties to engage with and there will also be the interface with the South Western franchise's emerging service planning on the Hounslow loop to ensure that neither sets of plans are compromised. Identifying an acceptable solution for Bollo Lane will also require effective rail industry and local authority working.
- 5.2.4. At this stage it appears that TfL is best placed to provide project leadership as the scheme is progressed. TfL has experience of planning and management of major transport investment in London and can realise the benefits from the synergies between the proposed West London Orbital service and the North and West London lines (London Overground), its role with many train operators in the London area and with the HS2 interface at Old Oak Common.



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