December 2020

OAPF Transport Strategy

MAYOR OF LONDON

TRANSPORT FOR LONDON

EVERY JOURNEY MATTERS

Contents

* For all assumptions and technical references please refer to Appendix C and D.

1 Introduction

London's population is forecast to continue growing and there is significant pressure to deliver more homes and jobs, together with a need to provide a high quality of life for all Londoners.

The current London Plan identifies the need to deliver 49,000 new dwellings each year over the period 2011 to 2036. Over the last ten years however, an average of 25,000 homes a year have been delivered. The result of this shortfall has been rapidly increasing housing costs and diminishing affordability. Given the housing shortage, the draft new London Plan sets out a need to increase the rate of housing delivery in future to address the backlog of under-supply.

London needs to bring forward new sites for residential development as well as increase densities on existing sites where this is achievable. The availability of public transport is critical to delivering housing in areas with strong development potential.

The Thames Estuary Corridor has long been identified as having substantial potential for housing and employment growth. The level of growth that could be accommodated is estimated to be approximately 250,000 new homes and 200,000 new jobs by 2041. However, progress in realising growth in the corridor has historically been limited by poor transport connections. Delivering the scale of growth identified depends on improvements in transport connections and capacity, and a reduction in barriers to movement across the area.

The majority of potential growth identified within the Thames Estuary Corridor can be accommodated within eight Opportunity Areas (OAs) that lie to the north and south of the River Thames, as set out in the draft new London Plan and illustrated in Figure 1. Thamesmead & Abbey Wood sits between Woolwich to the west and Bexley Riverside to the east. Across the Thames, Thamesmead & Abbey Wood is bordered by Royal Docks & Beckton Riverside to the north-west and London Riverside to the north.

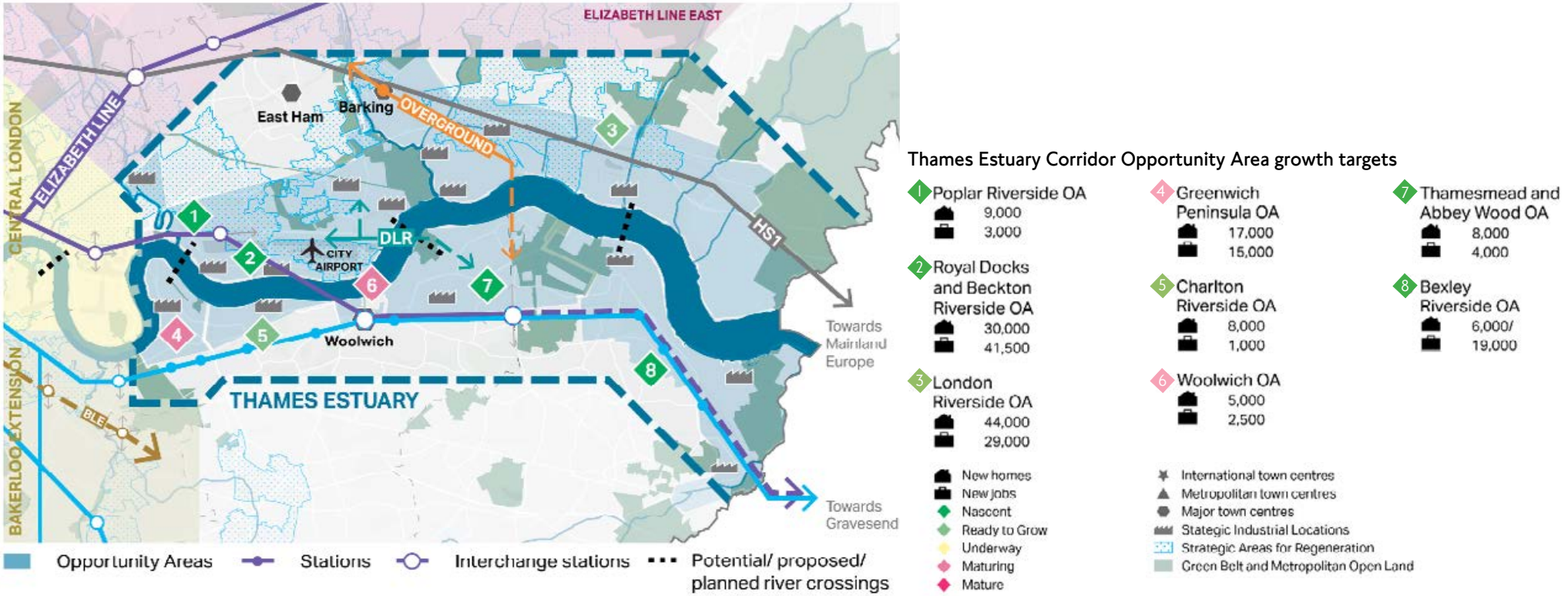


Figure 1. Draft new London Plan growth areas - Thames Estuary Corridor (source: GLA)

At 811 hectares, Thamesmead & Abbey Wood OA is one of the largest growth areas identified in the draft new London Plan, with indicative growth potential of 8,000 new homes and 4,000 new jobs by 2041.

However, by adopting the principles of Good Growth and significantly improving public transport connectivity, notably more homes and jobs could be unlocked in Thamesmead & Abbey Wood, beyond the level envisaged in the draft new London Plan. With a new package of transport measures in place, the OA has capacity to support around 15,500 new homes and 8,000 new jobs.

The draft new London Plan estimates that in the Royal Docks and Beckton Riverside OA, to the north-west of Thamesmead & Abbey Wood (T&AW), there is potential to deliver 30,000 new homes and 41,500 new jobs and in Bexley Riverside OA, to the east, there is potential for 6,000 new homes and 19,000 new jobs. These OAs are closely linked with Thamesmead & Abbey Wood due to the potential for possible new transport interventions to serve and support growth in all three areas.

Transport for London (TfL) has been working in partnership with the Greater London Authority (GLA), Royal Borough of Greenwich and London Borough of Bexley to plan the transport improvements required to support the potential levels of growth in T&AW. Together we have considered how new developments can be integrated with existing communities, as well as with the wider boroughs in the Thames Estuary Corridor.

The Mayor's Transport Strategy and draft new London Plan set out a vision for Good Growth in London, a concept that proposes that plans for growth should improve the health and quality of life of all Londoners, reduce inequalities and make the city a better place to live, work and visit. Key themes of Good Growth include planning for the right number of homes and using London's growth as an opportunity to deliver higher levels of affordable housing and mixed-use developments, in order to spread London's economic success and create stronger communities. Good Growth identifies the importance of planning new developments in a way that reduces car dependency and encourages active travel in order to improve Londoners' health; increase access to opportunities by providing better public transport; and make the city a better place to live.

Transport is fundamental to achieving Good Growth in the T&AW OA. Providing high quality public transport connections and safe and attractive walking and cycling routes will enable people to choose active and healthy ways to travel, while supporting the delivery of high-density development. To support the growth ambition set out in the T&AW Opportunity Area Planning Framework (OAPF), a holistic transport strategy is required to address the needs of both existing and new communities.

Figure 2 shows how this transport strategy forms part of a suite of documents that together make up the OAPF for the area, which in turn will inform local policy.

The transport strategy explores the current transport challenges facing the OA and assesses the ability of the existing transport network to support the level of growth proposed. It identifies the transport infrastructure that is needed in the short, medium and long term to enable growth to happen, while also addressing the needs of existing communities.

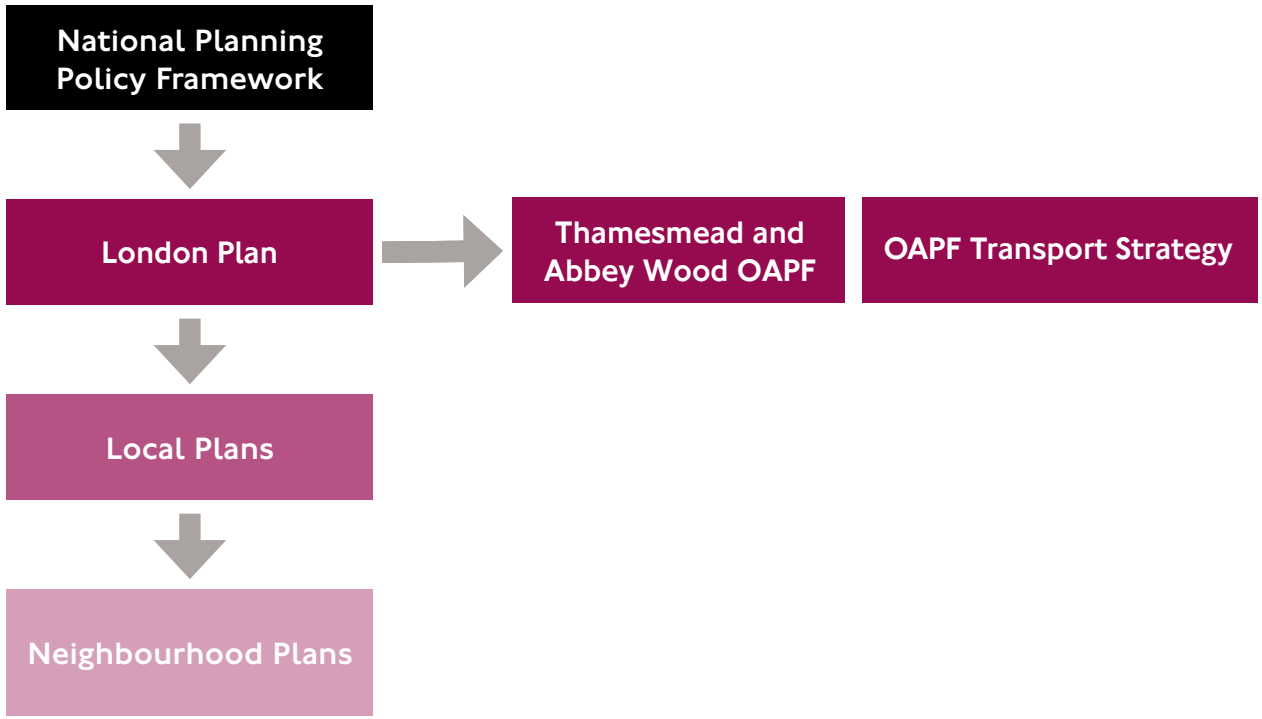


Figure 2. Planning policy framework diagram (source: GLA)

Supporting growth in T&AW

Several scenarios have been considered in the T&AW OAPF, based on different levels of transport investment. These scenarios have been developed and tested as agreed by TfL, GLA, Royal Borough of Greenwich and London Borough of Bexley.

In this Strategy, produced by TfL, we consider which transport interventions best support an intermediate stage of growth and which best support a high level of growth in the OA. The reference case, the two preferred transport interventions and the associated levels of development that they would unlock are illustrated in Figure 3.

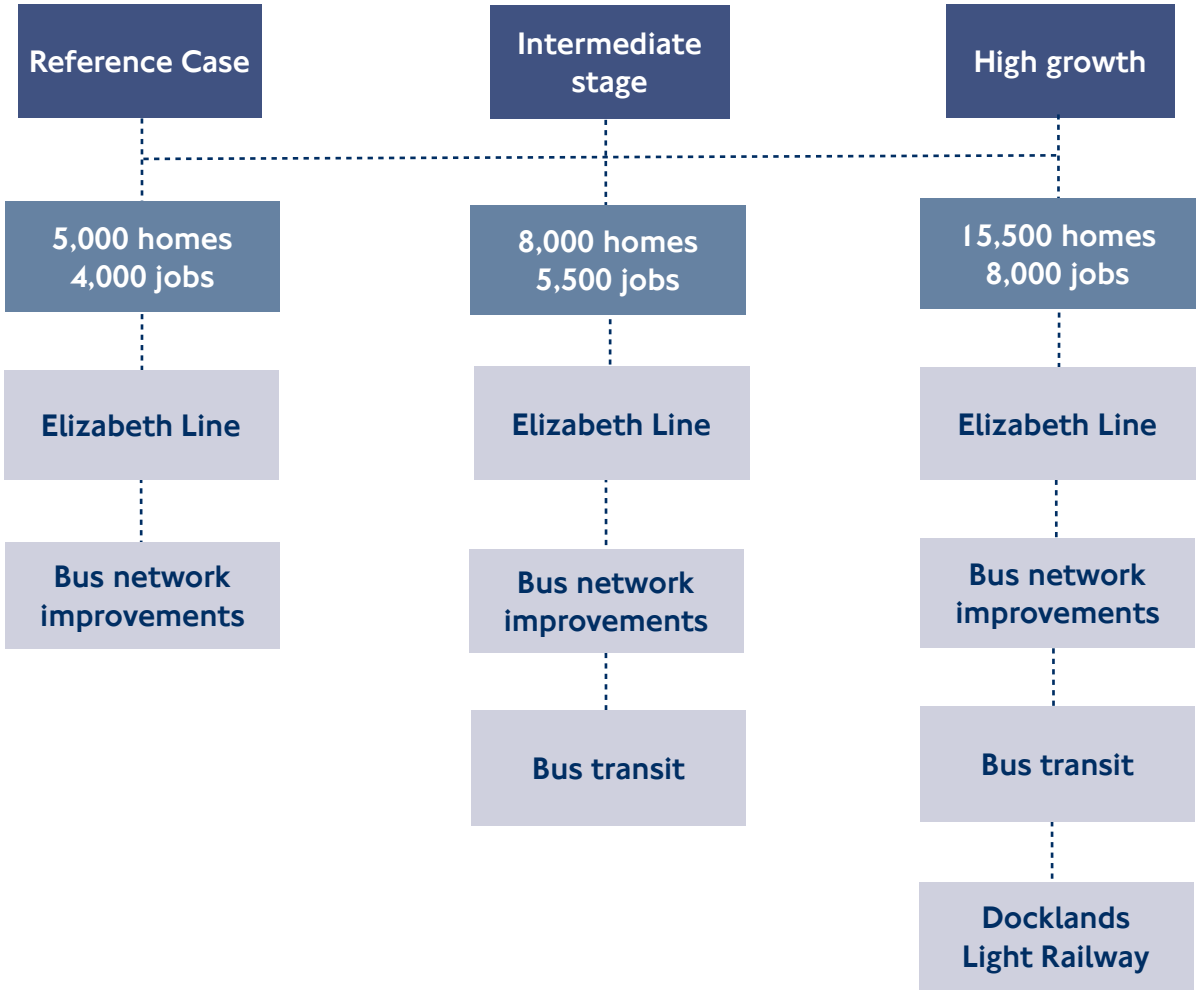


Figure 3. Preferred transport infrastructure to support growth

Transport modelling

The development of this Strategy has been informed by strategic transport modelling, which has allowed us to forecast the impact of different growth scenarios on the transport network, and to test the ability of potential new transport interventions to serve demand in a way that supports and promotes Good Growth.

This has been modelled:

Baseline (2015) the transport network in its existing form with 2015 levels of population and employment.

Reference Case (2041) the existing transport network with the addition of the Elizabeth line and supporting local bus service enhancements, new developments that are soon to be or already in the planning process, and background growth in population and employment (unplanned growth).

Intermediate growth (2041) Reference Case plus an additional 3,000 housing units and 1,500 jobs, and transport interventions to support an intermediate level of growth.

High growth (2041) Reference Case plus an additional 10,500 housing units and 4,000 jobs, and transport interventions to support a high level of growth.

London Overground extension (2041) Reference Case plus an additional 4,000 housing units and 2,000 jobs, and transport interventions to support a higher level of growth.

By modelling travel demand under intermediate and high growth scenarios, it is possible to test the ability of new public transport services to cater for increased demand and to identify the services that would achieve the greatest shift away from private vehicle trips. Despite part of the OA being in outer London, a target of 80 per cent of journeys to be made by public transport, walking and cycling is considered achievable to in the OA if supported by the right level of investment.

2 Transport provision and patterns of use

Historic transport infrastructure development

Thamesmead is the principal town within T&AW OA. It has a unique history as London's only post-war New Town, designed in the 1960s to help address London's housing shortage. It has been progressively developed since then.

In the south of the OA, Abbey Wood grew gradually throughout the late 19th and early 20th century as a result of the construction of the North Kent railway line and tram services to Woolwich. At this time, much of the land to the north of Abbey Wood belonged to the Royal Arsenal site, which extends across Plumstead Marshes between Woolwich and Erith. After the majority of this land was vacated by the military, the Greater London Council developed plans for the creation of an urban extension in Thamesmead, to address London's housing shortage.

The area was developed between the 1960s and 1980s in a number of stages and sectors, of which Thamesmead South was the main housing zone, leading to further population growth in Abbey Wood. Thamesmead East was initially designated for industry and commerce, while Thamesmead Central functioned as a local town centre, providing retail and other services. Later phases of residential development were located in North Thamesmead and West Thamesmead, which saw low density private development on a major scale.

The concentration of strict land use zoning within Thamesmead, together with spatial segregation of social homes built in the early phases and private homes built in the later stages, means that patterns of development the OA are not typical of other parts of London. The OA also has different economic characteristics to the boroughs of Greenwich and Bexley in which it is situated.

Improving connectivity to and from Thamesmead & Abbey Wood was identified as a key strategic component in supporting development in the original 1960s Thamesmead masterplan. The masterplan proposed a new rail station east of Plumstead and included a central highway (now Eastern Way) with three lanes of traffic in each direction to allow residents to reach central London via a new river crossing.

The original proposals for a new rail station and road tunnel or bridge across the Thames were dropped from the masterplan, due to the high cost of the schemes. Later proposals came forward in the 1970s to extend the Jubilee line to Thamesmead town centre, but these plans were changed and an alternative Jubilee line extension terminating at Stratford was built instead. As a result, despite the proximity of the OA – and in particular Thamesmead – to central London, the area remains largely isolated and disconnected from London's rail-based public transport network.

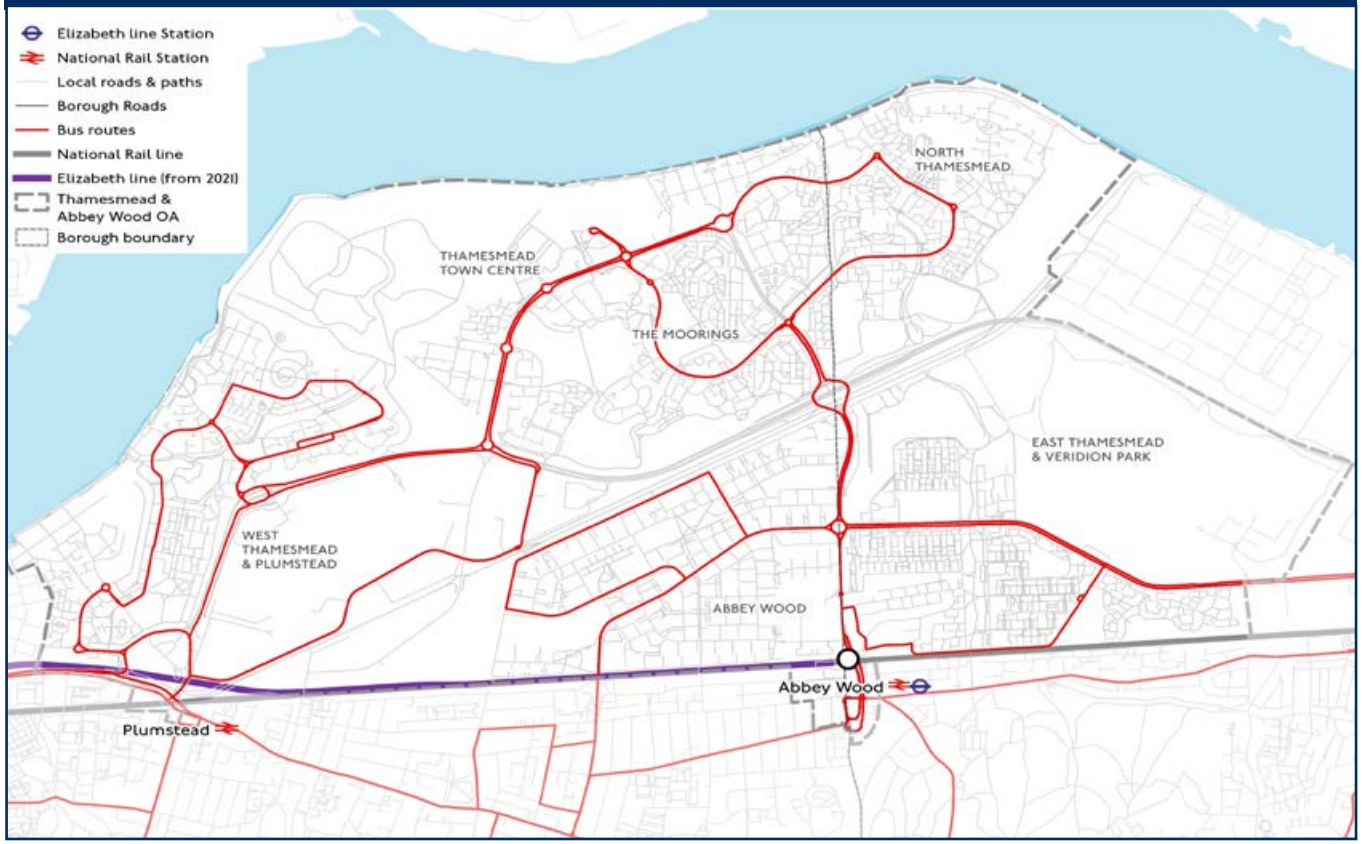
Existing public transport connections

Figure 4 shows the existing public transport network serving T&AW. The North Kent rail line forms the southern boundary of the OA with stations serving the area located at Plumstead and Abbey Wood and trains to central London every 5 to 10 minutes at peak times. Southeastern and Thameslink services provide connections from these stations to central London rail stations including London Bridge (25-30 minutes), Blackfriars (30-40 minutes), Charing Cross (40-45 minutes), and St Pancras (40-50 minutes).

Once open, the Elizabeth line will serve Woolwich and Abbey Wood stations, providing a quick and frequent service with 12 trains per hour to destinations such as Canary Wharf (11 minutes), Liverpool Street (17 minutes) and Tottenham Court Road (23 minutes).

The OA is served by 18 local bus routes, providing access to a range of destinations including North Greenwich, Woolwich, Belvedere, Bexleyheath, Lewisham, Peckham, Sidcup and Bluewater. The existing bus interchange facilities in Thamesmead town centre are limited, however, with no dedicated bus station and existing bus stops and stands at or near capacity. The town centre performs poorly as a bus interchange and investment is required to improve passenger experience and to make buses a more attractive option.

Figure 4. Existing public transport services in the Opportunity Area



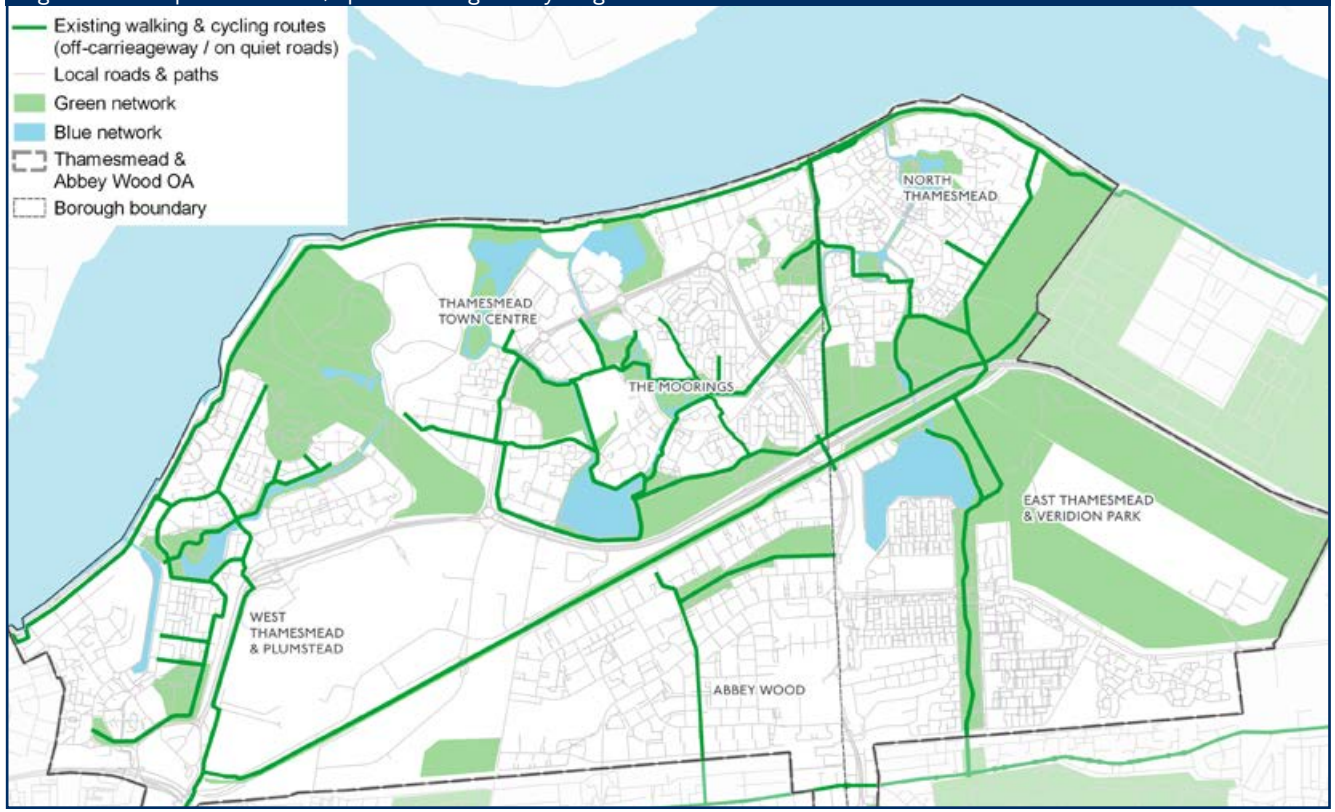
Walking and cycle environment

Figure 5 shows existing walking and cycling networks in the OA, parks and other green spaces and rivers, lakes and canals (the green and blue network).

A network of off-road walking and cycling routes exists within the OA although its quality is variable and much needs upgrading. The primary routes are the Thames Path and the Ridgeway, an outfall sewer that creates a raised 3.5 mile linear foot and cycle path through the area. The Ridgeway is poorly integrated with the wider walking and cycling network, and it adds to severance between the north and south of the OA.

Although walking and cycling on much of the highway network is possible, key design principle of the 1960s Thamesmead masterplan was to segregate motorists and pedestrians by means of an elevated network of walkways and bridges. These were intended to enhance the mobility and safety of residents by removing potential conflicts between different road users, and to provide quick, free-flowing roads uninterrupted by pedestrian crossings. However, many of the off-road routes do not feel safe or comfortable. Concerns about noise from traffic led to the highest density housing in South Thamesmead being placed well away from major roads through the area. Combined with the separation of pedestrian routes, this policy has contributed to high vehicle speeds on the highways and, with an incoherent network of footways, few pedestrians using the streets, limited natural surveillance, anti-social behaviour and a road environment which in places actively discourages walking and cycling.

Figure 5. Principal off-street / quiet walking and cycling routes



Highway network

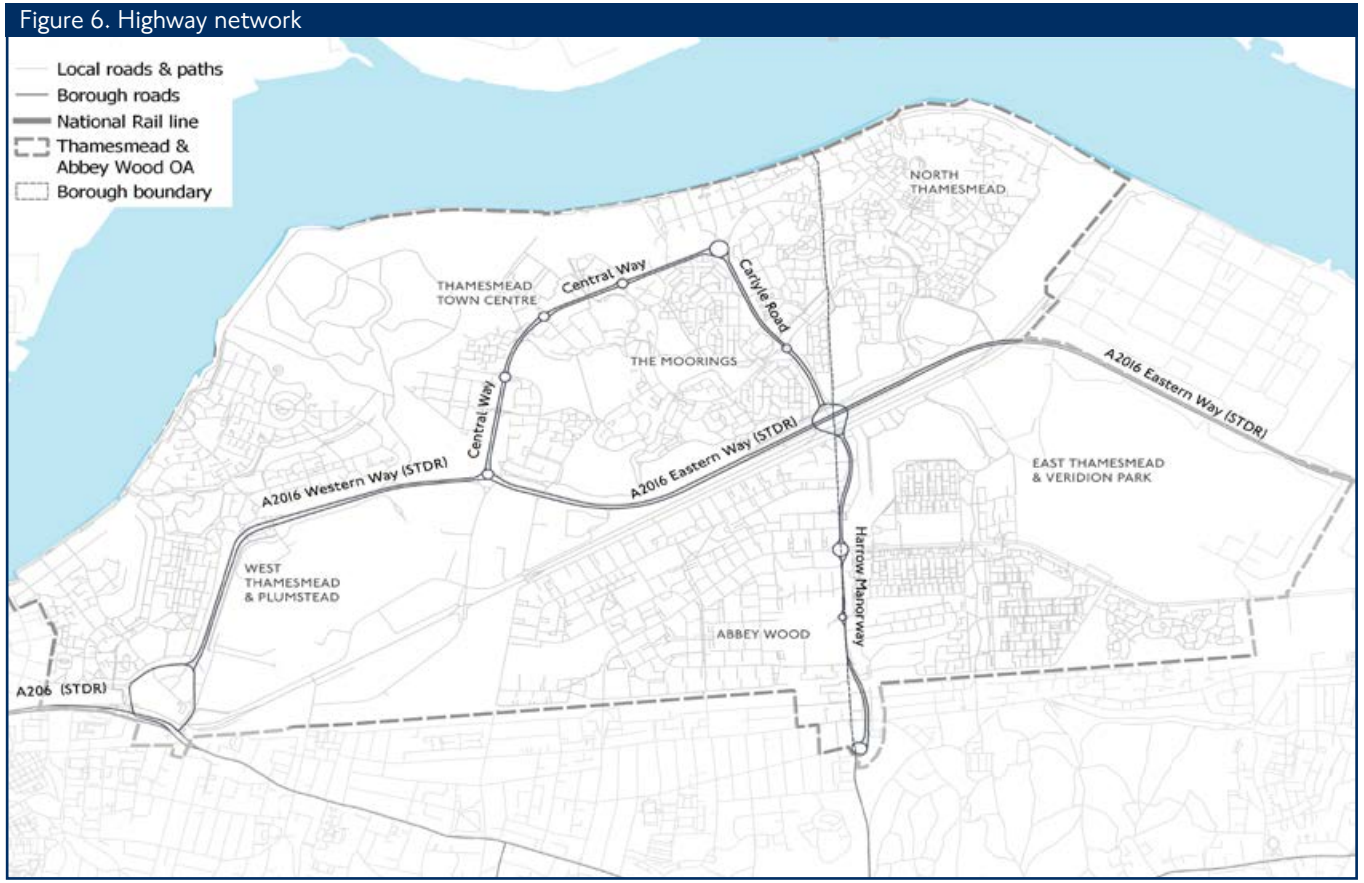
Figure 6 shows the location of key distributor roads within T&AW. The area is predominantly served by the South Thames Development Route (STDR), an important road corridor which forms part of London's Strategic Road Network and by the Borough Principal Road Network, comprising Central Way, Carlyle Road and Harrow Manorway, Easter Way and Western Way.

The STDR provides a key east-west corridor south of the Thames, linking the Blackwall Tunnel in Greenwich to the A2 near Bluewater in Kent. The A2016 Western/Eastern Way is part of the STDR, which passes through the centre of the OA connecting Plumstead and Belvedere, via the A206 Pettman Crescent/Plumstead Road.

These strategic roads are large scale highways that are heavily dominated by motor traffic, resulting in an intimidating environment for pedestrians and cyclists as well as structural severance (neighbourhoods being cut off from one another by main roads or railways) within the OA.

Off the main roads, cul-de-sacs are typical in residential areas of Thamesmead. While there are many walking and cycling routes within these areas, they are not always inviting or well-maintained. The urban layout is generally not very legible and does not lend itself to short, direct walking and cycling trips.

Figure 6. Highway network



Socio-economic factors influencing travel patterns

Between 2001 and 2011, the most recent Census years, the population of T&AW OA rose dramatically from just over 33,000 to just over 46,000, a 40% increase. This sharp rise has resulted in a significant increase in population density – from 45 people per hectare in 2001 to 63 people per hectare in 2011.

Figure 7 shows the change in age profile of residents within T&AW compared with the Royal Borough of Greenwich and the London Borough of Bexley between 2001 and 2011. The age profile of T&AW is relatively young, with 75% of residents aged under 45 in 2011 compared to 69% in the Royal Borough of Greenwich and 59% in the London Borough of Bexley.

Figure 8 shows that the ethnic profile of residents is relatively diverse, with 55% of T&AW residents from BAME backgrounds. The proportion of BAME residents increased notably, from 30% in 2001 to 55% in 2011. With an increasingly young and ethnically diverse population, the travel requirements of the OA have changed in recent years: fewer people own cars and are choosing to drive. This should be taken into account as part of the OAPF by ensuring good quality public transport services and walking and cycling infrastructure are planned for people living in the OA.

Figure 7. Age Profile, 2001-2011 (source: Census 2011)

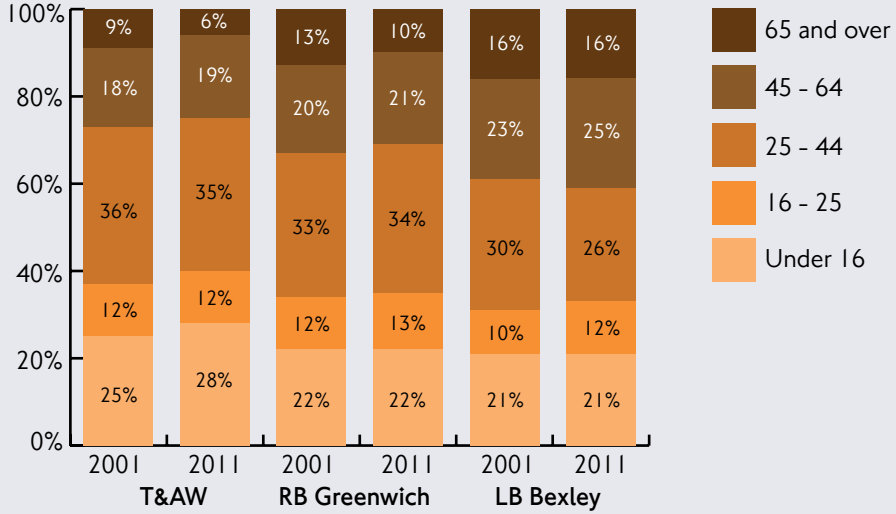
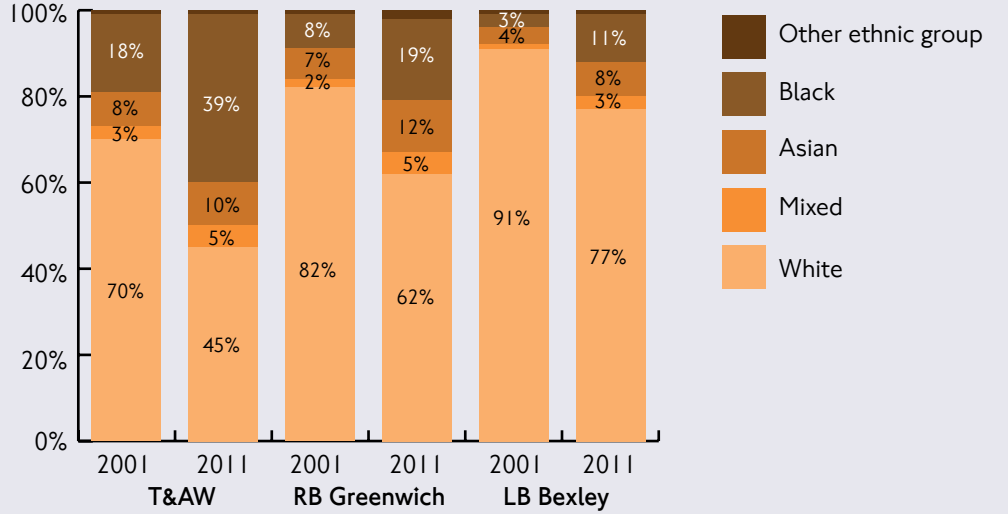


Figure 8. Ethnicity Profile, 2001-2011 (source: Census 2011)



Household income levels observed within T&AW are lower compared with both borough-wide and London-wide averages. 60% of households in T&AW have a household income under £25,000, which is notably higher than the corresponding percentages in Bexley and Greenwich (50% and 51% respectively).

Patterns of employment in the OA reflect the limited extent of the public transport network that serves it, with just under 30% of T&AW residents working in central London. While there are areas of local employment within and close to the OA, other nearby centres of employment such as the Royal Docks and Isle of Dogs that offer a large and growing number of high quality jobs are currently poorly connected to the OA.

Improving public transport access to these centres of employment and, across London more generally, could transform the prospects of those living in the OA and encourage new residents to move into the area. The creation of new homes in Thamesmead will also create new local jobs, for example in local retail, education, health and other servicing industries, providing new employment opportunities in the OA.

Current travel patterns

Figure 9 shows the levels of car ownership and Figure 10 shows mode share in T&AW compared to the Royal Borough of Greenwich and London Borough of Bexley.

Car ownership in the OA fell between 2001 and 2011. Census data shows that the proportion of households with a car fell from 61% in 2001 to 57% in 2011, with average car ownership falling from 0.78 cars per household to 0.73 over the same period. More recent data from the London Travel Demand Survey (LTDS) indicates that the level of car ownership has remained broadly static since 2011.

In line with car ownership, journey to work data from the Census shows that commuting by car fell in the OA between 2001 and 2011. A higher proportion of T&AW residents now use public transport to commute. This data only considers the mode of travel used for the longest part of the trip, however, and does not take into account walking and cycling as part of a multi modal trip, so the number of existing walking and cycling trips within the OA is likely to be underestimated.

As shown in Figure 10, car usage is higher across trips made for all purposes (commuting and other). LTDS data shows that 40% of all trips made by T&AW residents between 2012 and 2015 were made by car. The remaining 60% of trips were made by other modes of transport (30% public transport, 25% walking, 2% cycling and 3% other).

Figure 9. Current car ownership (source: Census 2011)

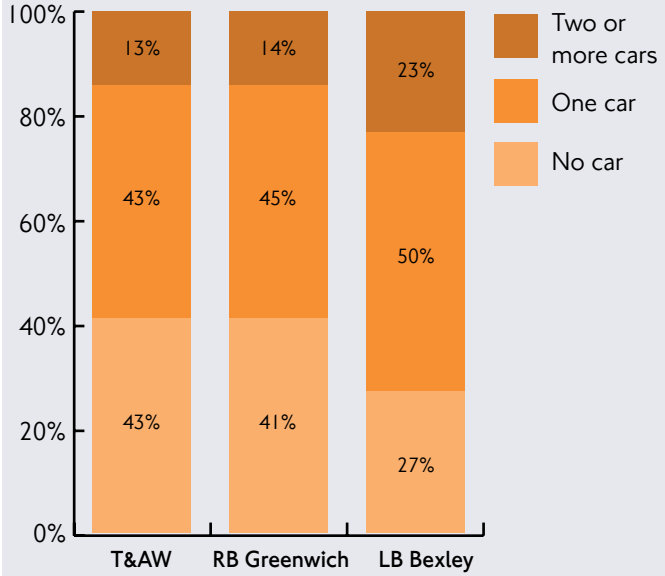
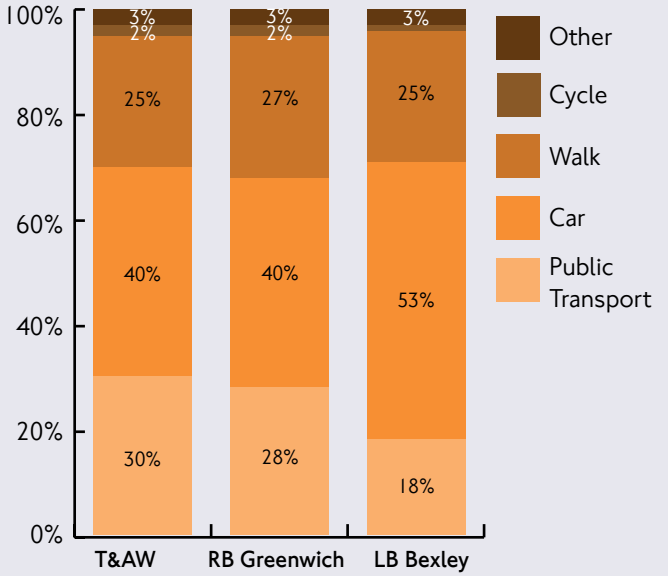


Figure 10: All day mode shares (source: LTDS 2012-2015)



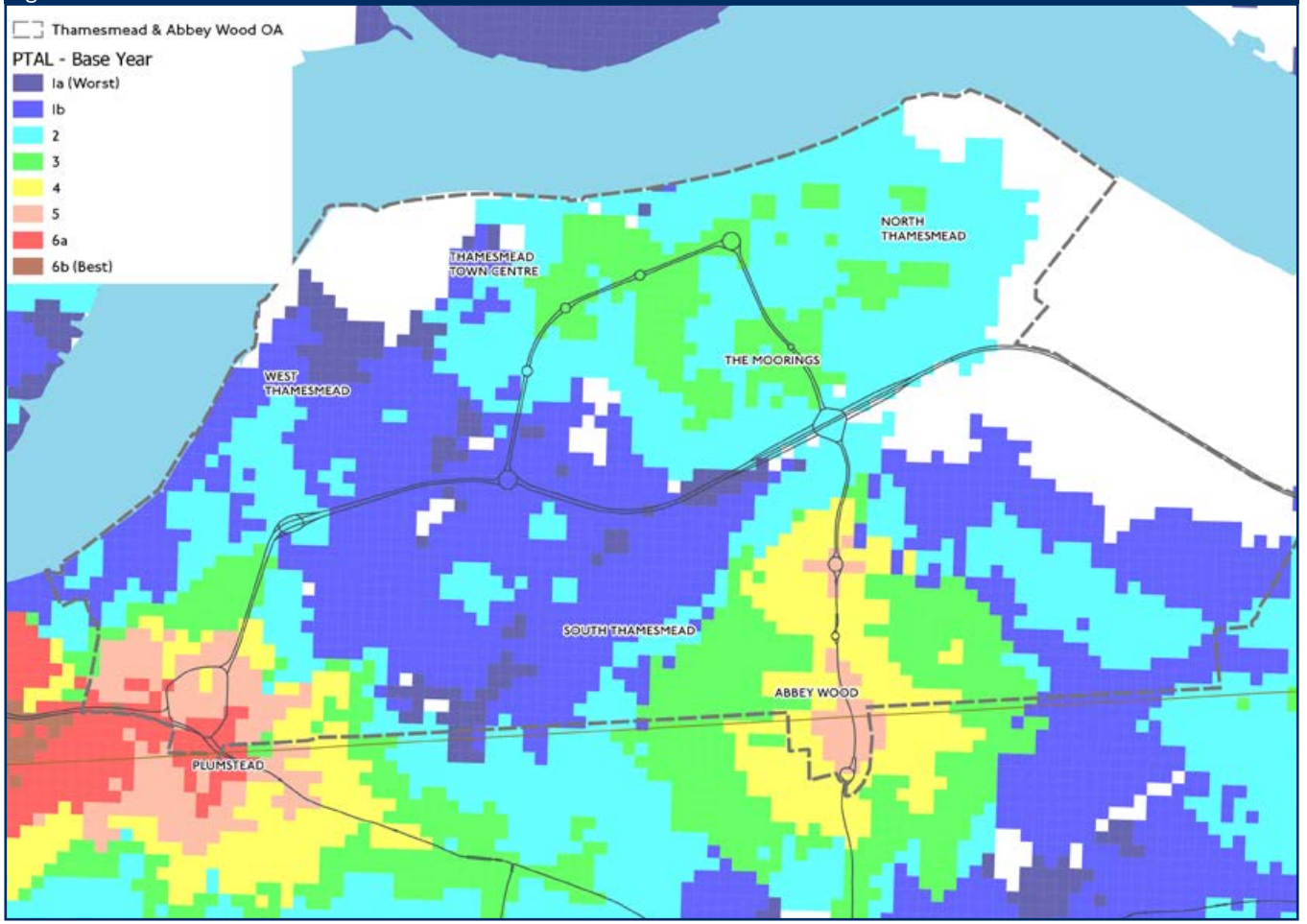
Access to public transport

Access to public transport varies significantly across the OA, as shown in Figure 11. Public Transport Accessibility Levels (PTALs) are highest in the south of the area, around Woolwich, Plumstead and Abbey Wood stations on the North Kent rail line. Accessibility in these areas will be further increased when the Elizabeth line opens.

PTALs are moderate along Harrow Manorway and in Thamesmead town centre, due to the concentration of bus routes serving this corridor. However, throughout much of the OA – particularly around North and West Thamesmead – PTALs are low, indicating very poor access to public transport. These areas are typically beyond a 1,500m (15-20 minute) walk from the rail network in the south of the OA. Coupled with problems of structural severance (e.g. the combined barrier of the Ridgeway and Eastern Way which separate the north and south of the OA, much of Thamesmead has no direct access to rail services).

Assessment of PTALs highlights the need to introduce new public transport connections in Thamesmead in order to bring forward sustainable development.

Figure 11. Baseline PTALs (2015)



Future travel patterns

Once open, Elizabeth line services will commence from Abbey Wood, directly connecting the OA with Canary Wharf, the City, the West End and, further afield, Heathrow Airport and Reading, as shown in Figure 12. The introduction of the Elizabeth line will result in significant improvements to journey times from Abbey Wood station near T&AW to key centres of employment such as Canary Wharf (11 minutes), Liverpool Street (17 minutes) and Heathrow (51 minutes). With trains every five minutes in the peak periods, this will represent a step-change in transport connectivity for the area.

The forthcoming arrival of the Elizabeth line has already generated significant development in the south of the OA. In 2018, there were over 3,300 new homes permitted or considered 'active' in the planning process. These are centred around Abbey Wood, in response to the connectivity enhancements the Elizabeth line will bring. This growth will stimulate new employment opportunities, with a need for social infrastructure to support new housing developments. A portion of the potential 4,000 new jobs in T&AW identified in the draft new London Plan will result from upcoming developments.

An extension of the Elizabeth line to the Bexley Riverside OA and potentially beyond is being considered by the London Borough of Bexley, TfL, GLA and neighbouring local authorities outside London. This would benefit T&AW OA by further improving access to employment and other opportunities to the east of the area.

Figure 12. Elizabeth line route map

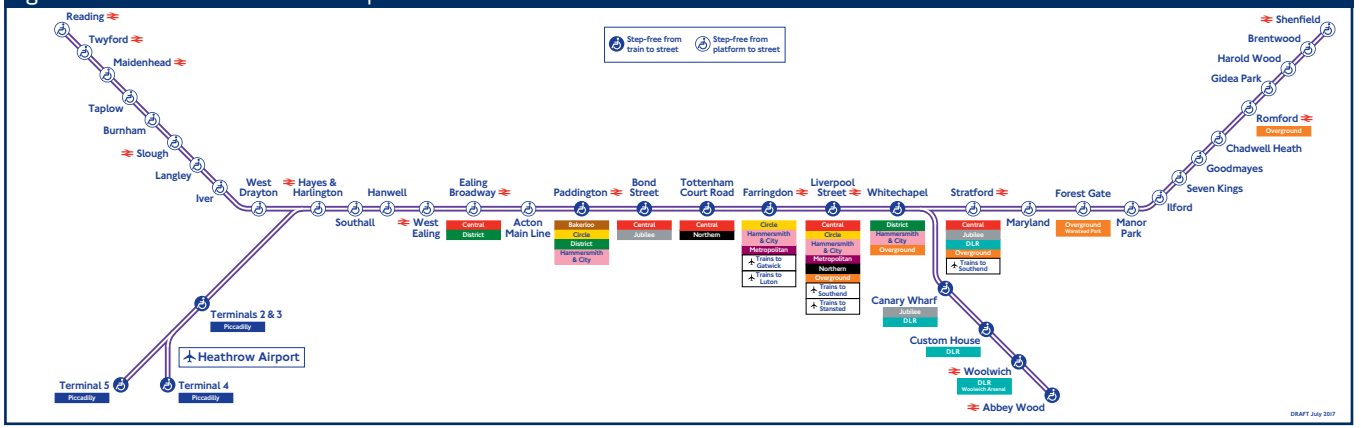
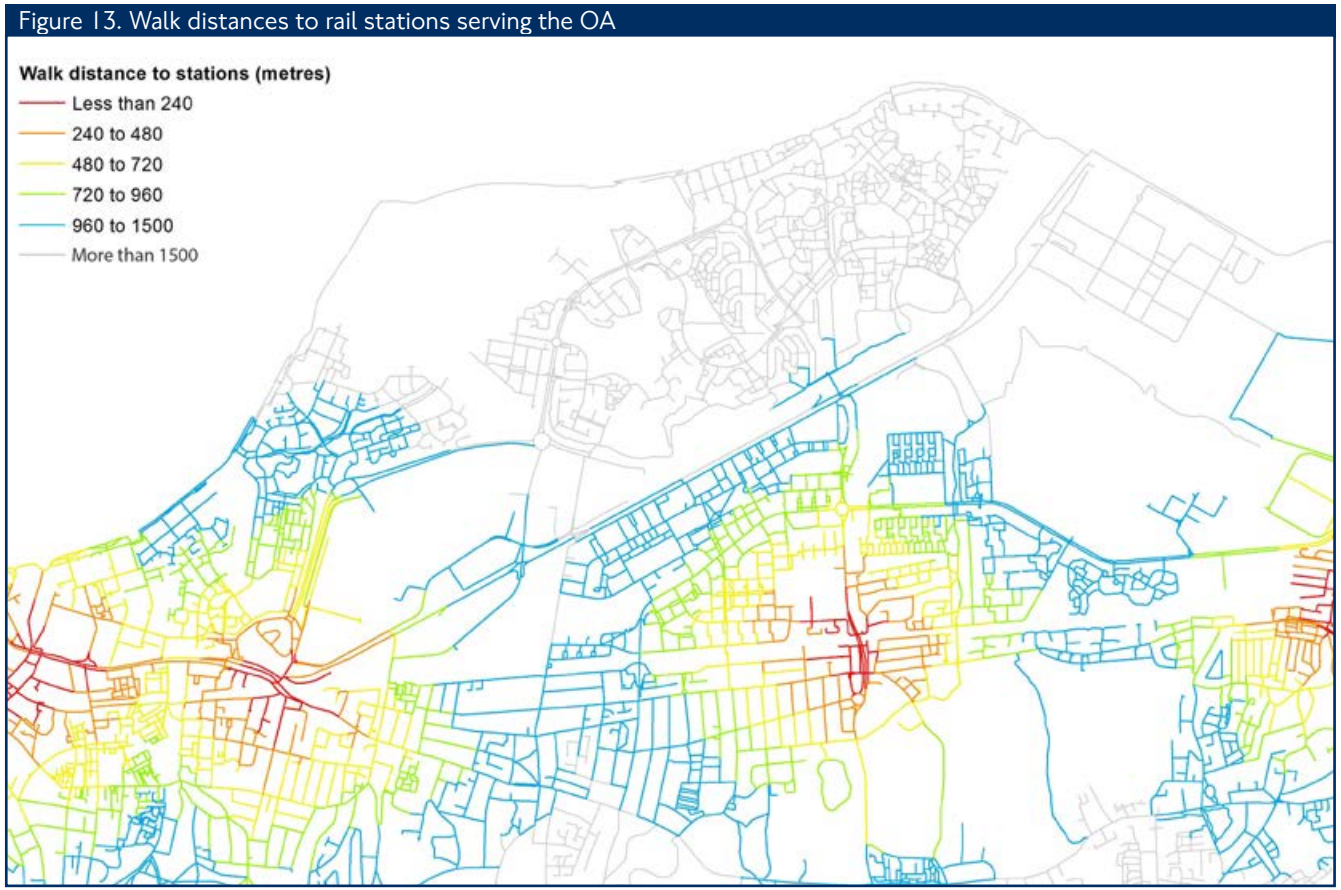


Figure 13 demonstrates that while the Elizabeth line will deliver a step change in transport connectivity around Plumstead and Abbey Wood, the majority of residents in the OA live further than 1,500m (or a 15-20 minute walk) from these rail stations. This is roughly the limit assumed to how far people will be prepared to walk to reach a station. Long walk distances combined with severance in the OA will mean the north of the OA will continue to have poor access to rail services.

With the potential introduction of new public transport services (set out in Chapter 5), there is an opportunity to significantly improve accessibility across the northern half of OA.

Detailed information about the transport challenges and opportunities in T&AW, including cross-river connectivity and access to employment, bus capacity and journey time reliability, uptake of walking and cycling, and safety and air quality, is provided in Appendix A. Chapter 3 provides an overview of these issues.

Figure 13. Walk distances to rail stations serving the OA



3 Summary of transport challenges and opportunities

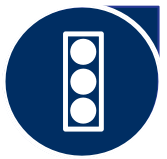
The analysis presented in Chapter 2 and Appendix A can be summarised under five challenges and opportunities which the Opportunity Area Planning Framework transport package seeks to address.

Improve strategic connectivity

There is potential in T&AW to deliver significant growth in housing and employment, particularly in northern parts of the OA, but poor public transport connectivity has historically acted as a constraint.

With Elizabeth line services soon to commence from Abbey Wood, new housing developments are coming forward in the south of the OA. However due to its size much of the OA is beyond a 1,500m walk (15-20 minutes) from Abbey Wood and other rail stations, with PTAL values of 2 or lower, so the introduction of Elizabeth line services will have a limited impact in the north of the area. Despite improvements to local bus services to maximise the connectivity benefits of the Elizabeth line, this part of the OA will remain fairly isolated.

Investment in new strategic public transport connections serving Thamesmead is required to act as a catalyst for development and regeneration in the north of the OA.



Manage the performance of the highway network to protect essential journeys and improve safety

While the scale of growth potential is a great opportunity for the OA, achieving the OAPF's vision for Good Growth will be a significant challenge.

The scale of development potential within the OA is such that some increase in traffic demand is likely. Addressing the safety and pollution impacts that arise from use of the existing highway network will be key challenges, along with encouraging mode shift to active and public transport modes of transport in order to minimise congestion and ensure essential traffic, in particular buses and freight, is not subject to excessive delays.

Additionally, measures are required to improve the operation and safety of the highway network for active and public transport modes. In line with Vision Zero, competing pressures on road space need to be managed in order to provide safe routes for people walking and cycling.

Improve local connectivity and reduce severance

Local connectivity on foot and by cycle within the OA is fragmented due to physical barriers to travel including road and rail infrastructure, the urban form, and in places the green and blue network. Despite the number of off-road foot and cycle paths, wayfinding is poor and making use of these routes can be challenging. As a result, many short distance trips that should be easily made on foot or by cycle are being made by car.

Ideally, all local needs would be served in a way that minimises the need to travel - people might choose to walk to a local centre and be able to access quick and reliable public transport to get to a more distant town centre. The existing town and local centres in the OA generally struggle to offer good quality, accessible services and social amenities because of the urban form and severance that exists, preventing easy movement through the area. Investment in the existing centres is needed to help enhance their offer, reinforce their identities and help to attract people from within the OA and further afield.

Improve the health of residents and facilitate travel by sustainable modes

Current travel patterns are unsustainable against a backdrop of high levels of population and employment growth across London, high levels of obesity and low levels of physical activity in the OA. There is potential for a number existing trips made within T&AW to be walked or cycled, based on their length, however car use remains high.

A clear challenge for the OA is therefore to support behaviour change and encourage more people to walk and cycle as their first travel choice, or for part of a longer journey, to support the Mayor's aspiration for 80% of all trips to be made using sustainable modes of transport.

Implementing the Healthy Streets Approach, which puts human health and experience at the heart of planning the city, will be key to encouraging behaviour change for existing residents and active and healthy travel choices for new residents.

Integration of land use and transport

Where investment in public transport unlocks new development in the OA it will be important to integrate new homes and jobs with the transport network in order to minimise negative impacts of extra transport demand. Similarly strengthening links to new and existing transport hubs including Abbey Wood would positively influence the transport choices made by existing communities in the OA.

Incorporating the Good Growth principles set out in the draft new London Plan, such as building new developments in places well served by public transport and good quality walking and cycling routes, and limiting the number of parking spaces at new developments, will help to promote active lifestyles in T&AW and tackle some of the key challenges facing the OA including the dominance of vehicles in the area.

4 An integrated transport strategy for Thamesmead & Abbey Wood

Interventions and solutions

In response to the challenges summarised in Chapter 3, this chapter details the potential transport interventions that have been considered and the extent to which each option might unlock extra development capacity and support growth in the OA. The interventions have been assessed through application of specialist knowledge and evidence, together with stakeholder liaison.

To support the level of growth promoted by the OAPF, a number of transport connectivity, accessibility and capacity improvements will be required to make sure that development and transport in the OA are fully integrated. To ensure the most appropriate transport interventions are made, the suitability of these has been considered against:

i) the objectives of the Mayor's Transport Strategy;
ii) challenges and opportunities for the OA; and
iii) the outcomes of strategic transport modelling, to ensure that the preferred package of improvements is suitable and effective in the short, medium and long term.

Supporting the delivery of new homes and jobs

Growth and new transport connections are intrinsically linked in T&AW. Large-scale new developments will not come forward in the OA without new strategic transport connections, and likewise there would not be a case for new transport infrastructure in the OA without the delivery of growth.

Northern parts of the OA, including the areas around Thamesmead town centre, represent the greatest opportunity to accommodate new homes and jobs. However, improved public transport connections to other parts of London are required to unlock and support this growth, as these locations are among the furthest from existing public transport services.

In addressing this challenge, a range of strategic public transport interventions has been identified that would make travel to and from isolated parts of the OA easier and more convenient. The interventions identified vary in terms of the investment required to deliver them and the scale of growth in housing and employment they could support, as shown in Figure 14.

The public transport interventions that best serve growth in the OA are later taken forward and modelled under intermediate growth and high growth scenarios to provide an understanding of how the transport network would perform with the new public transport services and associated levels of growth.

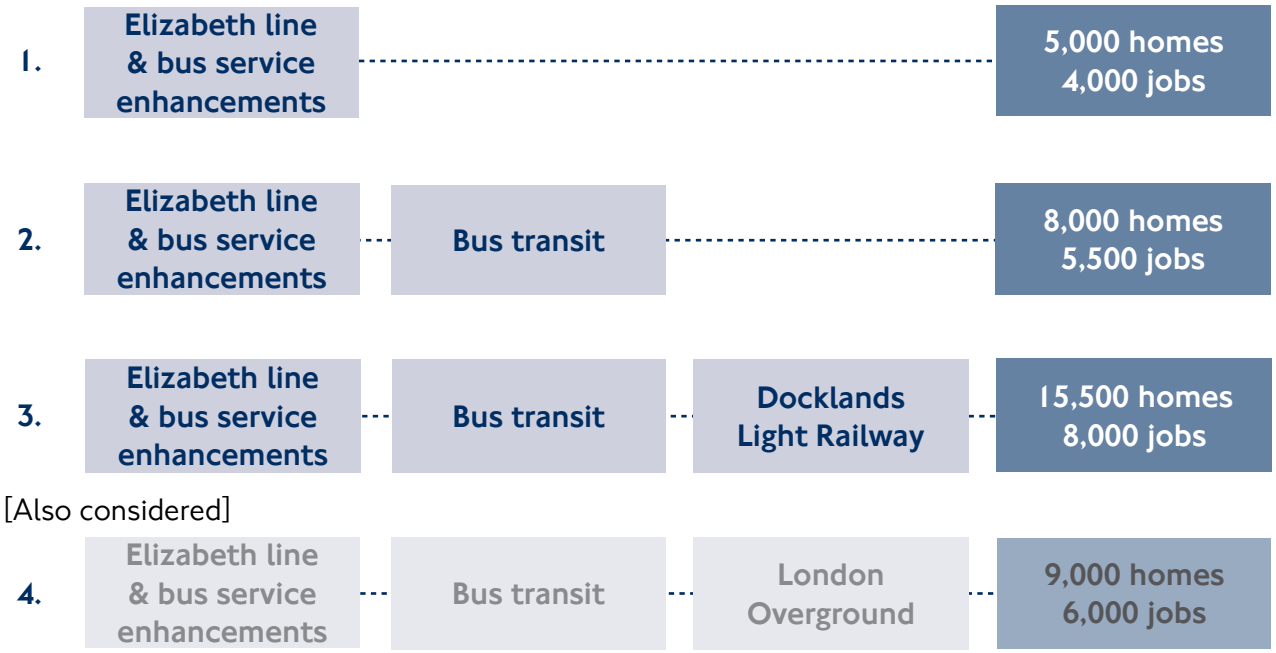


Figure 14. Transport infrastructure to support growth in T&AW

The interventions included in each transport option considered in this chapter are colour coded as follows, to illustrate the way in which they should support the delivery of the MTS.

To support the creation of **new homes and jobs** in T&AW, improved public transport connections are required to increase connectivity, accessibility and capacity, and link the area with key economic centres such as Canary Wharf and the City.

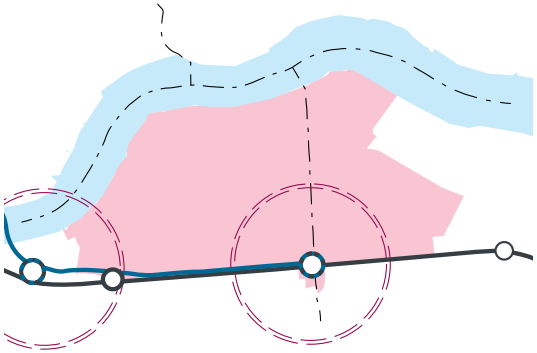
In promoting **a good public transport experience** for residents of T&AW, an increase in the availability, quality and reliability of public transport services is required.

Interventions are necessary to make travel within the OA easier and more attractive for people on foot, cycle and public transport in order to create **healthy streets for healthy people** and encourage a mode shift away from the car.

More detail on key local connections and public realm projects across the OA can be found in Part 5 - Places of the T&AW OAPF.

More detail about the interventions to support the needs of T&AW can be found in Appendix B.

1. Bus service improvements



5,000 HOMES

4,000 JOBS

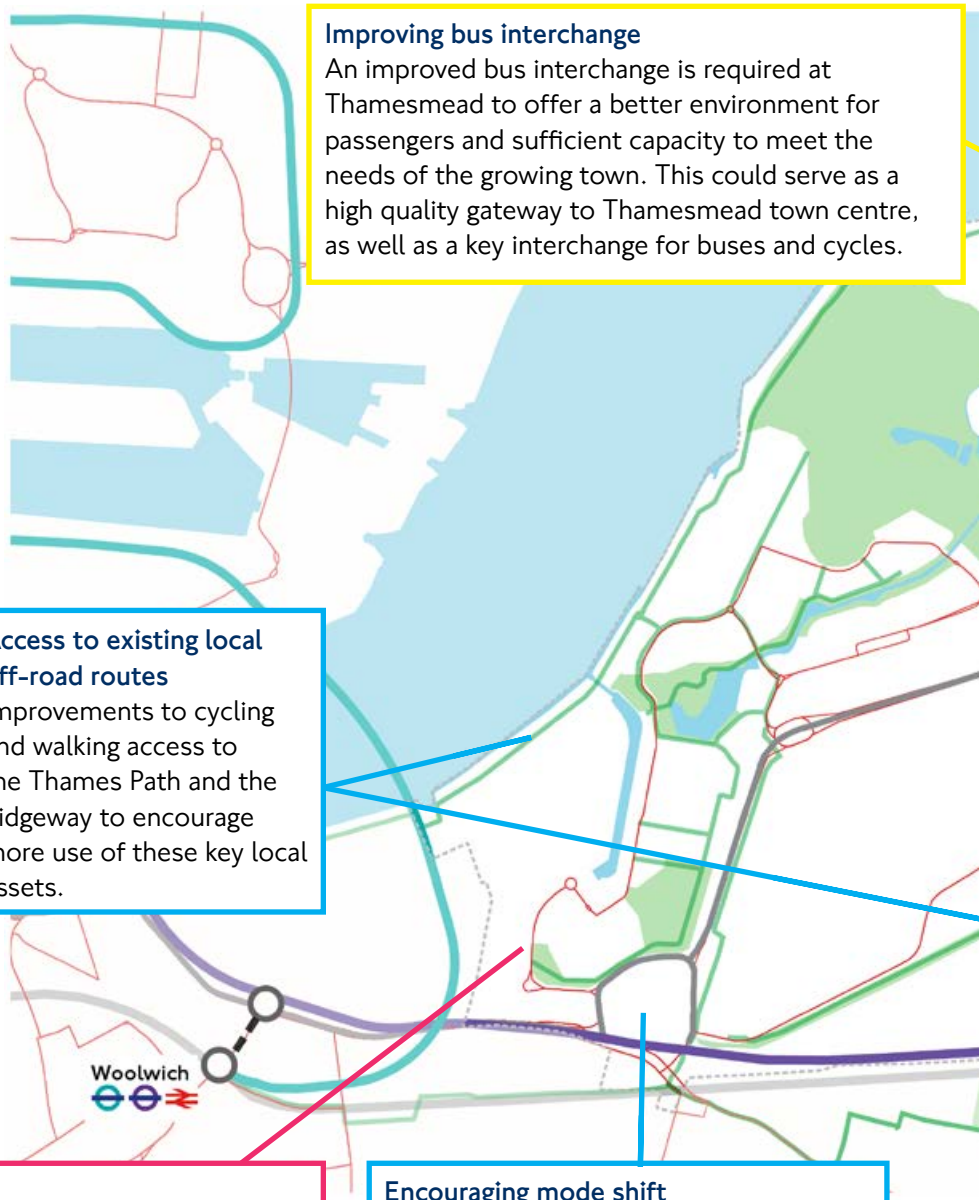
A number of bus service changes will be introduced to coincide with the start of Elizabeth line services from Abbey Wood. This option would look to supplement these bus service enhancements, either by introducing entirely new routes to serve OA or by increasing the frequency of existing services to cater for increased demand.

This is the lowest cost option of the four considered and would be relatively quick to implement, since it would not require building any significant new infrastructure.

Bus service improvements, on their own, would make a relatively small difference to the quality of the local public transport network, namely improving links to Abbey Wood and Woolwich for access to Elizabeth line. This scenario would not deliver a transfomation in the OA's connections to other parts of London.

It is unlikely that this option alone could unlock significant growth in the OA as it would not provide the step-change in public transport connectivity that is required to stimulate large scale regeneration. As such this option is not considered to support additional growth in the OA beyond that already identified in the London Plan, which is associated with the introduction of the Elizabeth line.

The adjacent map provides more information about this option, along with the wider transport requirements to support growth in the OA and the needs of existing residents.

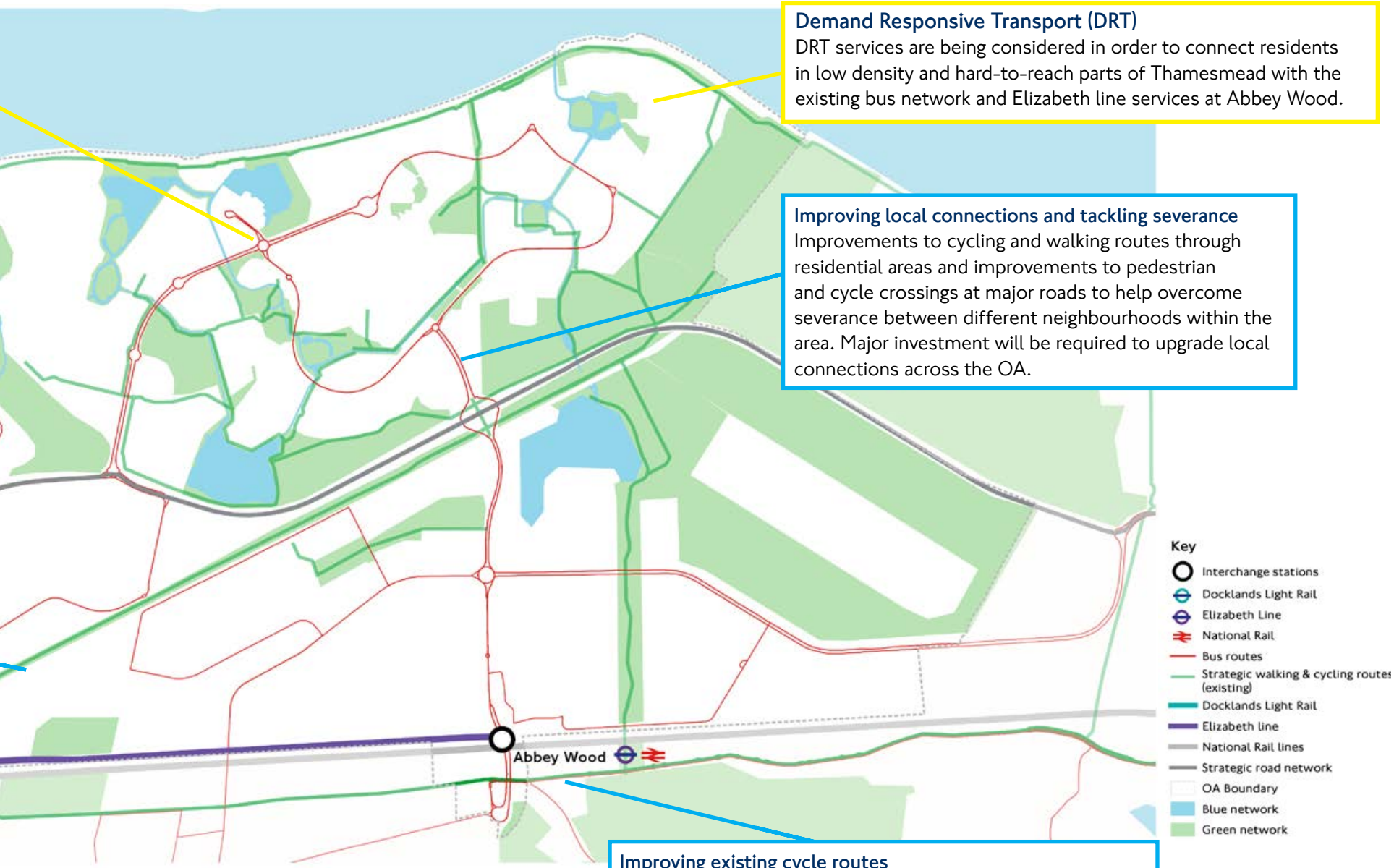


Improving bus interchange
An improved bus interchange is required at Thamesmead to offer a better environment for passengers and sufficient capacity to meet the needs of the growing town. This could serve as a high quality gateway to Thamesmead town centre, as well as a key interchange for buses and cycles.

Access to existing local off-road routes
Improvements to cycling and walking access to the Thames Path and the Ridgeway to encourage more use of these key local assets.

Bus service improvements
Enhancements to the local bus network will be made in response to the opening of the Elizabeth line. These could include new routes connecting Thamesmead with destinations beyond Woolwich and Abbey Wood.

Encouraging mode shift
Significant investment is required at major junctions in the OA to improve the experience of people walking, cycling and accessing the bus network.



Demand Responsive Transport (DRT)

DRT services are being considered in order to connect residents in low density and hard-to-reach parts of Thamesmead with the existing bus network and Elizabeth line services at Abbey Wood.

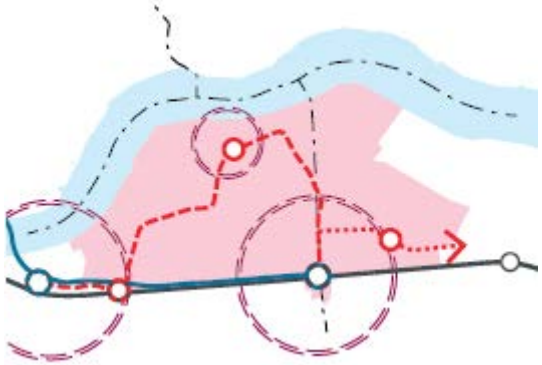
Improving local connections and tackling severance

Improvements to cycling and walking routes through residential areas and improvements to pedestrian and cycle crossings at major roads to help overcome severance between different neighbourhoods within the area. Major investment will be required to upgrade local connections across the OA.

Improving existing cycle routes

Improvements to the existing cycle route between Woolwich, Plumstead, Abbey Wood and Belvedere to provide a safe and direct east-west route that will connect Elizabeth line and National Rail stations with their surrounding neighbourhoods.

2. Intermediate stage - Bus transit



8,000 HOMES

5,500 JOBS

The second transport option to support an intermediate level of growth in T&AW, over and above the level of growth identified in the London Plan, is bus transit. By providing quick and frequent connections to Elizabeth line services and delivering dedicated, fixed infrastructure, this option is estimated to unlock in the region of 3,000 additional homes and 1,500 additional jobs in the OA.

This option would constitute a complementary and intermediate stage to the high growth scenario which is considered in more details in the next section.

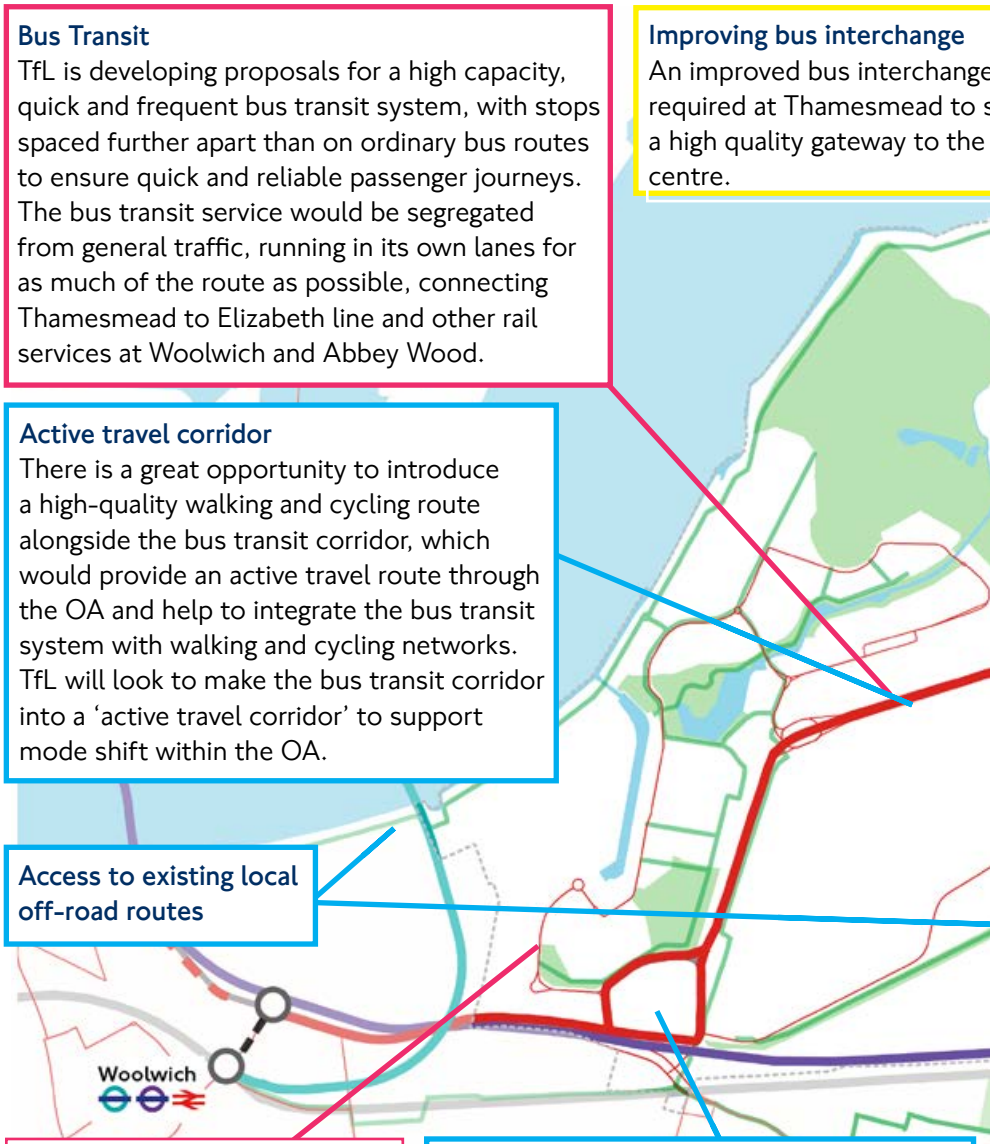
The adjacent map provides more information about the proposed bus transit system along side wider transport improvements to the walking and cycling network and to the urban realm.

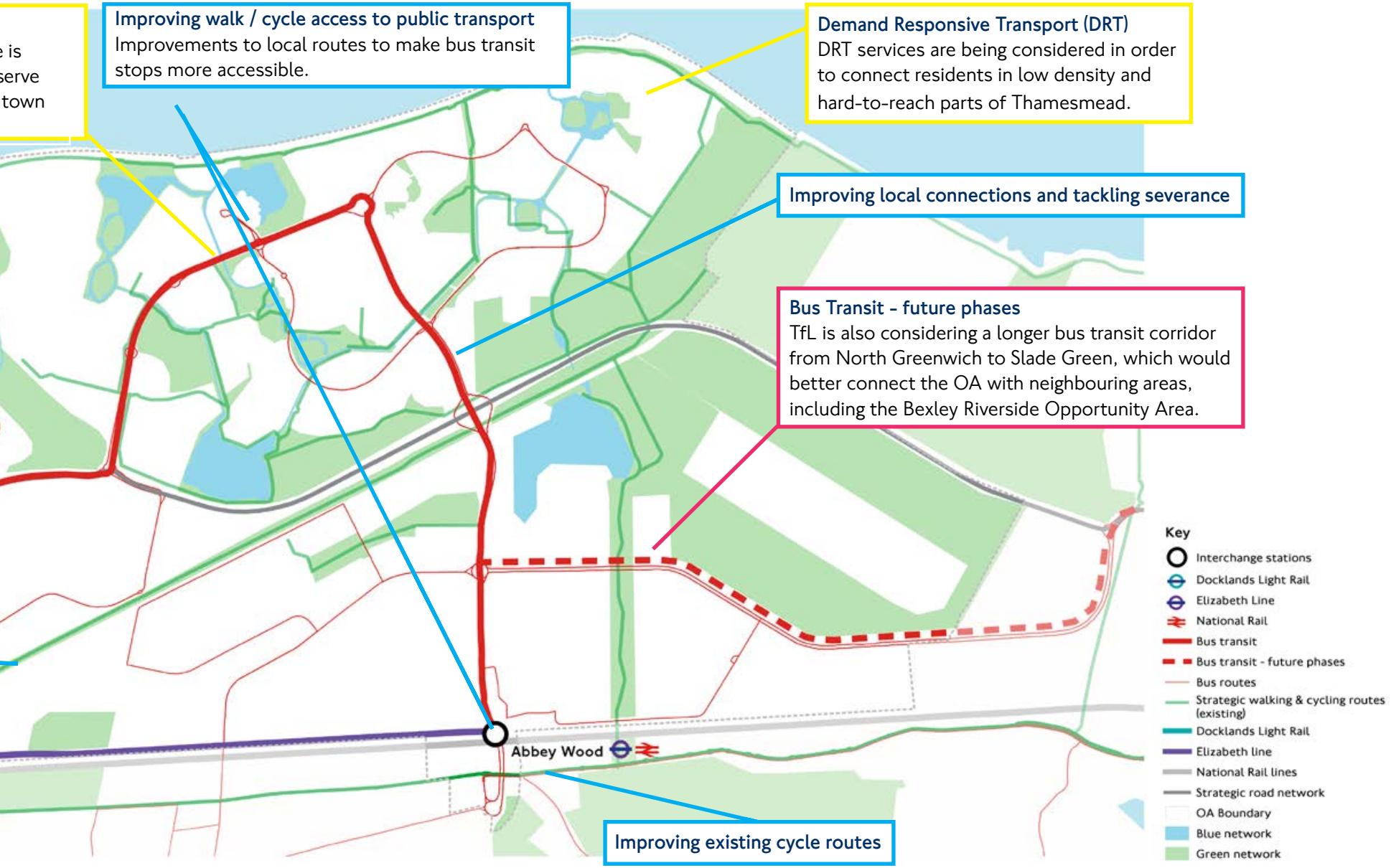
What is bus transit?

Bus transit can take many different forms, with a range of potential types of vehicle, passenger facilities and ways of operating. Differences between a conventional London bus service and bus transit include speed, dedicated lanes, reliability, and quality of vehicles and stops. The possible bus transit service in T&AW would aim to offer a similar level of service to a tram.

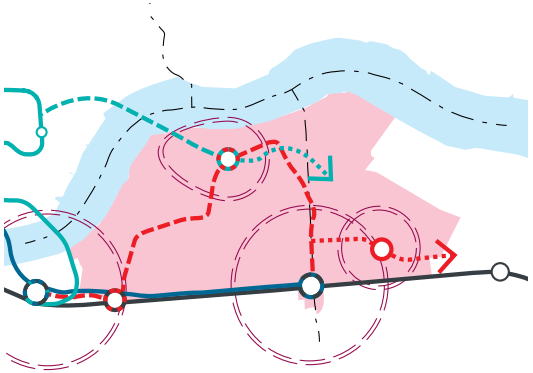
Bus transit, or Bus Rapid Transit, has been used elsewhere in the world to open up development opportunities, by providing a frequent and reliable bus-based public transport service at relatively low cost. More information about bus transit can be found in Part 2 of the T&AW OAPF.

Figure 14 Bus transitway in Metz, France




e is
serve
town
Improving walk / cycle access to public transport
Improvements to local routes to make bus transit stops more accessible.
Demand Responsive Transport (DRT)
DRT services are being considered in order to connect residents in low density and hard-to-reach parts of Thamesmead.
Improving local connections and tackling severance
Bus Transit - future phases
TfL is also considering a longer bus transit corridor from North Greenwich to Slade Green, which would better connect the OA with neighbouring areas, including the Bexley Riverside Opportunity Area.
Abbey Wood
Improving existing cycle routes
Key
Interchange stations
Docklands Light Rail
Elizabeth Line
National Rail
Bus transit
Bus transit - future phases
Bus routes
Strategic walking & cycling routes (existing)
Docklands Light Rail
Elizabeth line
National Rail lines
Strategic road network
OA Boundary
Blue network
Green network

3. Docklands Light Railway and bus transit



15,500 HOMES

8,000 JOBS

In addition to the transport interventions set out in options 1 & 2, a potential extension of the Docklands Light Railway (DLR) from Gallions Reach to Thamesmead is being considered, via the Thamesmead Waterfront site. This would better address the transport challenges and is considered to be the best value approach to delivering a high level of growth in the OA.

The adjacent map provides more information about the DLR extension considered. The transport interventions illustrated in options 1 & 2 would be delivered alongside a DLR extension.

Connectivity benefits

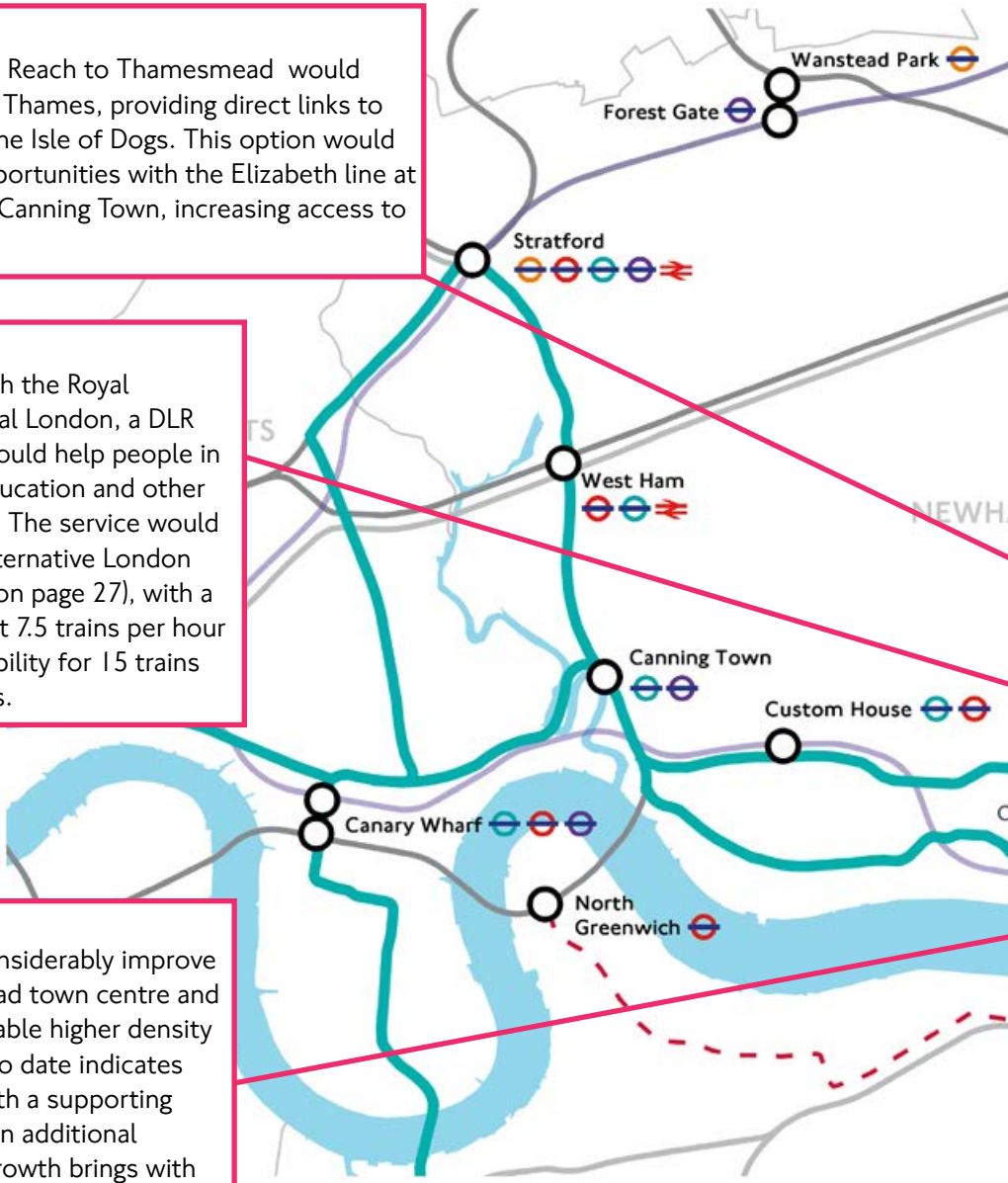
An extension of the DLR from Gallions Reach to Thamesmead would reduce the severance caused the River Thames, providing direct links to the Royal Docks and easier access to the Isle of Dogs. This option would also create convenient interchange opportunities with the Elizabeth line at Custom House and the Jubilee line at Canning Town, increasing access to central London and beyond.

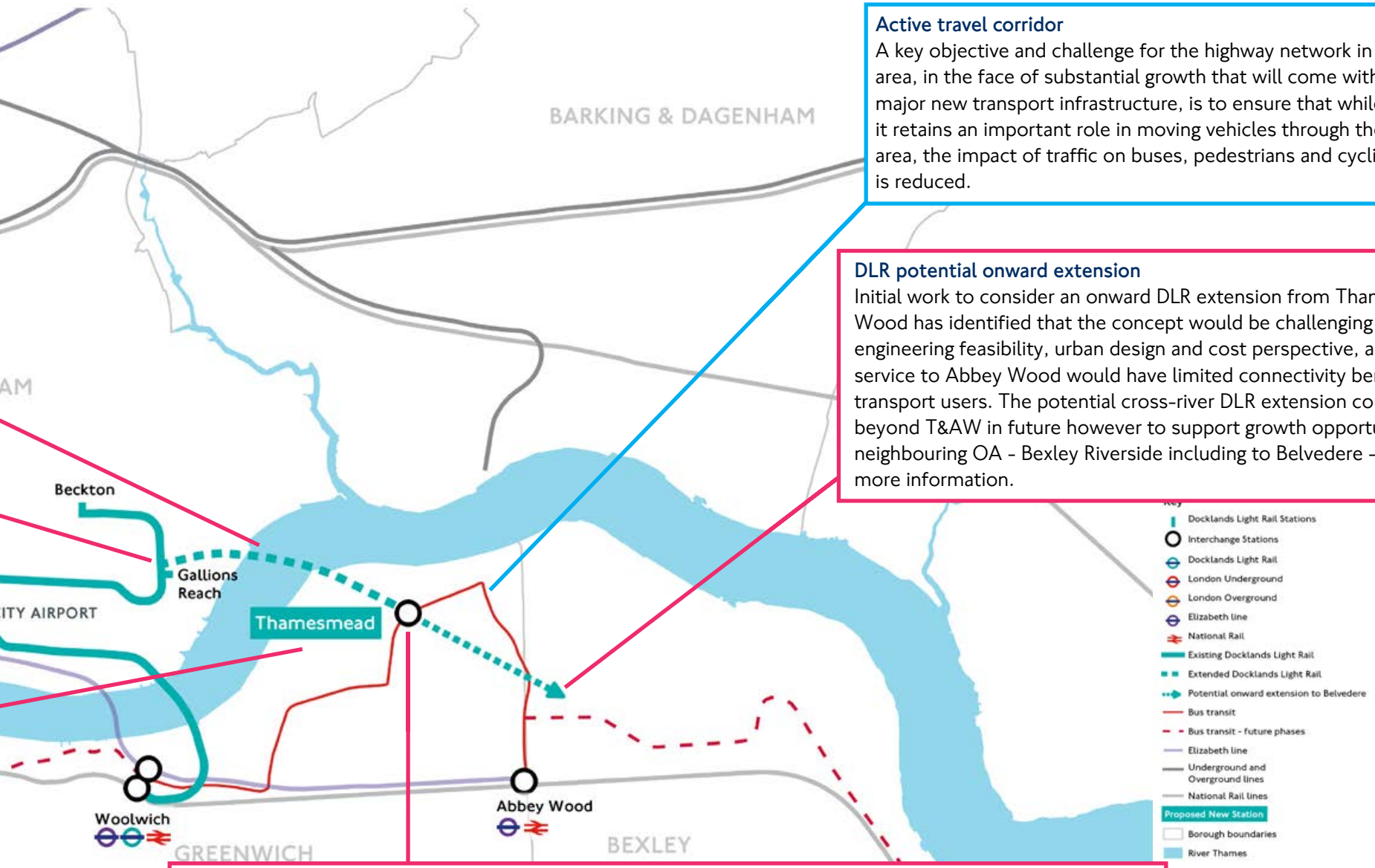
Journey time savings

By improving connectivity with the Royal Docks, Isle of Dogs and central London, a DLR extension to Thamesmead would help people in Thamesmead access jobs, education and other opportunities across London. The service would be more frequent than the alternative London Overground option (detailed on page 27), with a current assumption of at least 7.5 trains per hour in the peak periods, but capability for 15 trains per hour as demand increases.

Impact on growth

A DLR extension to Thamesmead would considerably improve access to public transport from Thamesmead town centre and at the Thamesmead Waterfront site and enable higher density developments around the station(s). Work to date indicates that extending the DLR to Thamesmead, with a supporting bus transit service, would support at least an additional 10,500 homes and 4,000 jobs in the OA. Growth brings with it more extensive opportunities to improve local connections, tackle severance and improve the quality of public realm at local centres. It enables the creation of a more joined-up and attractive walking and cycling network.





Active travel corridor

A key objective and challenge for the highway network in this area, in the face of substantial growth that will come with major new transport infrastructure, is to ensure that while it retains an important role in moving vehicles through the area, the impact of traffic on buses, pedestrians and cyclists is reduced.

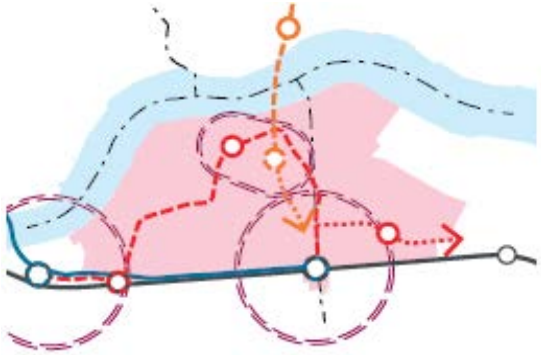
DLR potential onward extension

Initial work to consider an onward DLR extension from Thamesmead to Abbey Wood has identified that the concept would be challenging to deliver from an engineering feasibility, urban design and cost perspective, and extending the service to Abbey Wood would have limited connectivity benefits for public transport users. The potential cross-river DLR extension could be extended beyond T&AW in future however to support growth opportunities in the neighbouring OA - Bexley Riverside including to Belvedere - see page 31 for more information.

DLR route options and costs

Further work is required to identify the route options the potential DLR extension could take, and determine the number of stations it could serve. Further work is also necessary to determine exactly how much a DLR extension might cost; currently the cost is estimated to be around half that of the alternative high growth option, a London Overground extension to Thamesmead, due to the light rail infrastructure it would require.

4. Also considered London Overground and bus transit



9,000 HOMES

6,000 JOBS

As an alternative to the DLR extension, a London Overground (LO) extension connecting Barking Riverside to outer south east London via Thamesmead has been considered. This would help to address transport challenges in T&AW and support a higher level of growth in the area than the bus based options. It has been rejected as the preferred option to serve the OA however, as the connectivity benefits of a LO extension would be lower than that of a DLR extension and it would cost significantly more to build and operate.

The adjacent map provides more information about the LO extension.

Connectivity benefits

An extension of the LO network from Barking Riverside would provide a new cross-river rail link to Thamesmead. This would connect Thamesmead with Gospel Oak in north London, via Barking, and potentially onwards to a location such as Woolwich, Abbey Wood or Belvedere in south east London. While this option would provide outer London orbital connectivity benefits, it would not offer the same level of connectivity as the alternative high growth public transport option considered (the DLR), which would offer a radial connection to major employment centres such as the Royal Docks, Isle of Dogs and central London.

Impact on growth

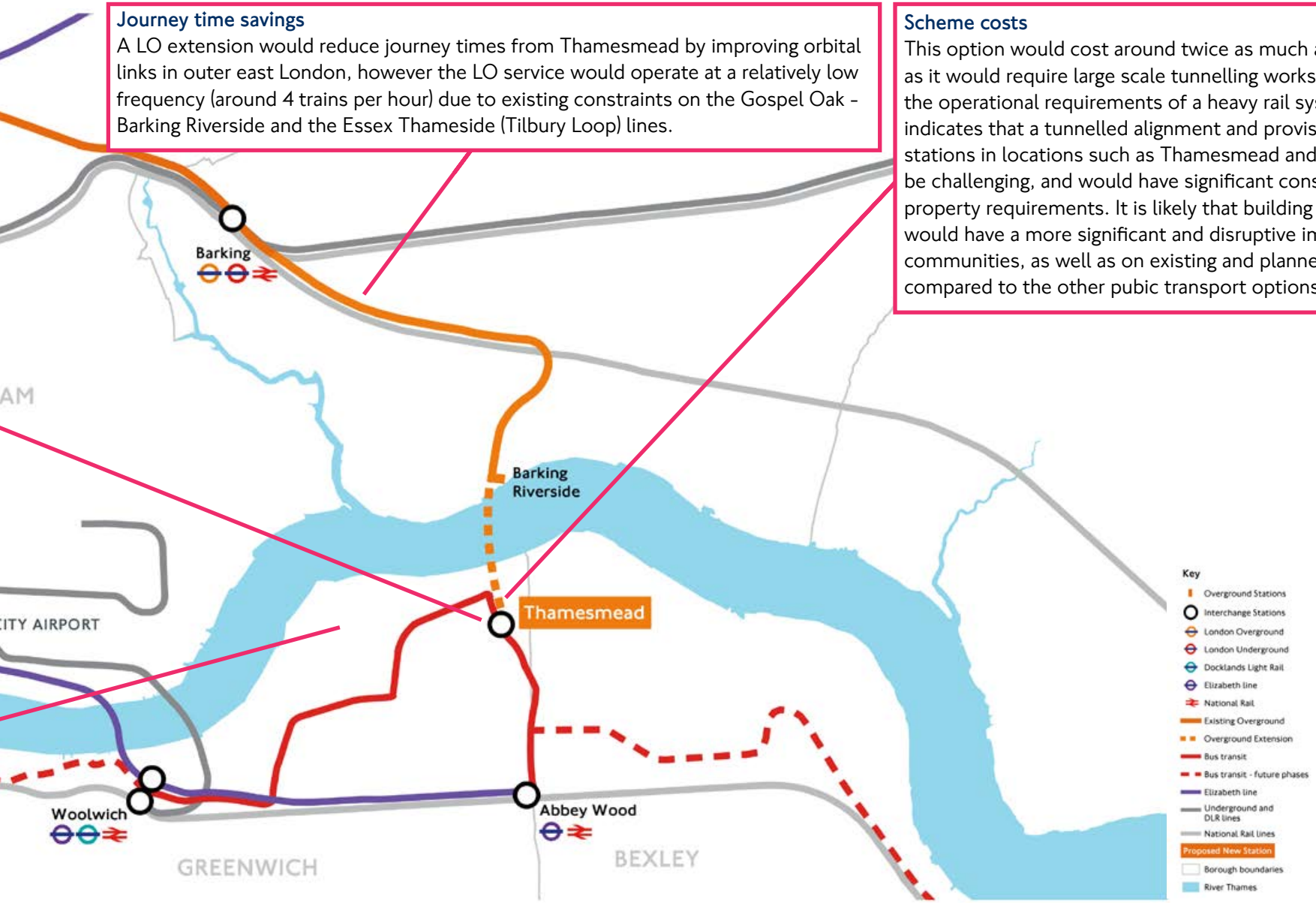
A LO extension would not be able to serve key development sites within the OA such as Thamesmead Waterfront as closely as the DLR, and it would also operate at a lower frequency than the DLR, so it is expected to support a lower level of growth in the OA (4,000 additional new homes and 2,000 additional jobs). There are some opportunities to improve local walking and cycling routes at locations where development takes place, and to improve conditions for walking and cycling generally.

Journey time savings

A LO extension would reduce journey times from Thamesmead by improving orbital links in outer east London, however the LO service would operate at a relatively low frequency (around 4 trains per hour) due to existing constraints on the Gospel Oak - Barking Riverside and the Essex Thameside (Tilbury Loop) lines.

Scheme costs

This option would cost around twice as much as the DLR option, as it would require large scale tunnelling works to accommodate the operational requirements of a heavy rail system. Initial work indicates that a tunnelled alignment and provision of underground stations in locations such as Thamesmead and Abbey Wood would be challenging, and would have significant construction, land and property requirements. It is likely that building a LO extension would have a more significant and disruptive impact on local communities, as well as on existing and planned development compared to the other pubic transport options considered.



Preferred options to unlock growth

High growth

A DLR extension in addition to bus transit and enhancements to conventional bus services is the public transport package considered best to support high growth in T&AW. This option is estimated to deliver around 10,500 homes and 4,000 jobs in addition to the level of growth in the Reference Case.

In fulfilling the growth vision of the OAPF, a DLR extension to Thamesmead is preferred over a LO extension because it would offer greater connectivity and capacity benefits, and is likely to cost significantly less to deliver and operate. However, it is recognised that an extension of the LO could provide wider strategic connectivity benefits beyond the Thamesmead and Abbey Wood OA, as part of the long term development of orbital rail links in outer London.

Intermediate growth

Of the strategic public transport options considered to support an intermediate level of growth, bus transit is the intervention that maximises connectivity and growth potential, as it supports the delivery around 3,000 homes and 1,500 jobs in addition to the level of growth in the Reference Case.

In addition to bus transit, enhancements to conventional bus services would be required to support an intermediate growth scenario in order to maximise the connectivity benefits of bus transit.

This potential intermediate stage would improve connections and kick-start development ahead of rail improvements.

Local connection interventions

Both scenarios in T&AW would also include delivering a package of signficant walking and cycling improvements to facilitate Good Growth and encourage a shift to active and public transport modes among both existing communities and new residents.

The adjacent map summarises the proposed transport interventions designed to improve the provision of public transport and support Good Growth in T&AW under the preferred, high growth scenario.

More detailed proposals can be found in Part 4 Places in the OAPF. It illustrates how each of the five places identified in the OA could change through Good Growth. It presents a walking and cycling network that would be easy to follow and safe with links to stations and other local destinations.

across the OA

Other considerations

Along with the packages of transport measures designed to improve transport connectivity, capacity and accessibility and unlock growth in T&AW, wider strategic interventions are being considered by TfL and other planning authorities that would benefit people in the OA. These interventions are not considered necessary to deliver the level of growth in T&AW identified in the OAPF but in future could positively impact the area.

Potential onward extensions

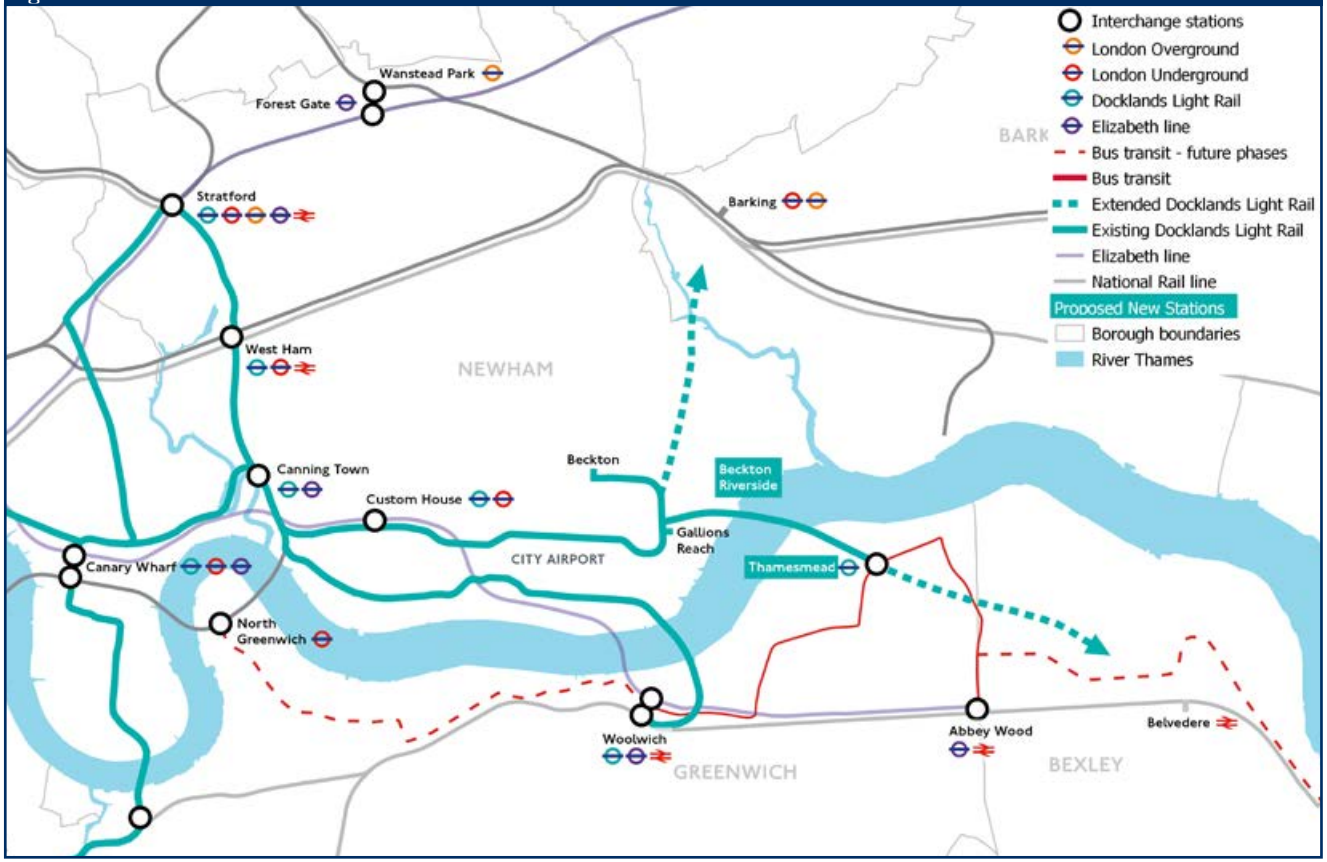
To further improve connectivity and support growth in the wider Thames Estuary Corridor, there are a number of ways the transport interventions proposed in T&AW could be extended in future, as shown in Figure 15.

As a later phase, TfL is considering a longer bus transit corridor from North Greenwich to Slade Green, which would better connect T&AW with its neighbouring areas. A longer scheme would support growth in both the Charlton Riverside and Bexley Riverside Opportunity Areas.

As part of the extension to Thamesmead, a DLR stop could be incorporated at Beckton Riverside to support growth in the Royal Docks & Beckton Riverside OA.

In the longer-term, a DLR connection from Barking to Belvedere could create a new orbital rail link between outer east and south east

Figure 15. Potential onward extensions



London, increasing public transport capacity and improving connectivity to support new housing and employment development across the Thames Estuary Corridor. This orbital link would improve access to existing employment centres such as the Royal Docks from the surrounding areas. A potential onward extension of the DLR to Belvedere could help unlock growth in Bexley Riverside. Further work is needed to demonstrate how improved public transport connectivity would support the delivery of substantial housing growth. This includes assessing a range of options, considering alternative schemes and evaluating the additional development opportunities each option offers. Proposals for this concept are at an early stage of development, and the delivery of an extension to Thamesmead is a critical first step in providing a cross-river DLR connection.

Extending the DLR to Abbey Wood has also been considered as an alternative onward extension from Thamesmead, however providing a DLR extension through South Thamesmead and integrating it with a new station at Abbey Wood would conflict with the housing development currently being delivered as part of the ongoing transformation of Abbey Wood.

Additionally any DLR extension could be above ground, which in Abbey Wood would create a series of adverse environmental impacts for existing and future residents including potential loss of open space, and adverse noise and visual impacts. Furthermore, the connectivity benefits of introducing a DLR link to Abbey Wood would be limited given that the area will already be served by the Elizabeth line, which offers quicker links to the Royal Docks (Custom House), Canary Wharf and central London

Elizabeth line service enhancement

Longer-term consideration is being given to capacity enhancements on the Elizabeth Line. This could be achieved through looking at options for lengthening trains by 20% or running more frequent services. Enhancement to the Elizabeth line services would further improve the public transport provision in the south of the OA.

Crossrail extension to Ebbsfleet (C2E)

Longer-term there is also potential to extend the Elizabeth line from Abbey Wood to Ebbsfleet along the North Kent line. This would better connect people in T&AW with neighbouring town centres in the London Borough of Bexley and further afield into Kent, as well as unlocking development potential in these areas.

Metroisation

The general service quality and performance of suburban National Rail services is consistently below that of equivalent TfL-run services on three key metrics:

- Public Performance Measure;
- Right Time; and
- Cancelled or Significantly Late.

Along with the complexity of service patterns, this means many people in T&AW opt to drive or use other local public transport services, such as taking the bus to the access the Jubilee line at North Greenwich.

The MTS sets out an ambition to create a London suburban metro, with the aim of bringing the frequency and reliability standards of suburban rail services in line with that of other TfL-run lines. While some network capacity constraints would remain on rail services through the OA, 'metroisation' or simplification of services could create a more attractive travel option and support mode shift away from the car.

Transport Modelling

The future operation of the transport network in T&AW with DLR, bus transit and bus service, walking and cycling improvements has been modelled and the results are explored in the following sections.

Reference Case for the Elizabeth line

Before the network with new public transport services is assessed, a future year Reference Case is set out to provide an indication of how the transport network would perform in 2041 with the opening of the Elizabeth line and associated development, but no additional development or transport interventions within the OA.

The Reference Case model includes upcoming developments around Abbey Wood and Plumstead stations. A greater number of homes will lead to an increase in the number of people departing the OA on a daily basis, mostly to the west, adding to the number of people travelling towards central London.

Assessment of the Reference Case scenario indicates that the introduction of Elizabeth line services and the associated capacity enhancements to the local bus network are sufficient to accommodate the expected level of growth within the OA in the short term. The Elizabeth line and associated bus service enhancements are expected to increase the proportion of trips made by active modes and public transport to 68% of all trips (up from 64% in 2015). This is substantially lower than the target of 80% of trips to be made by active and public transport modes within the OA by 2041.

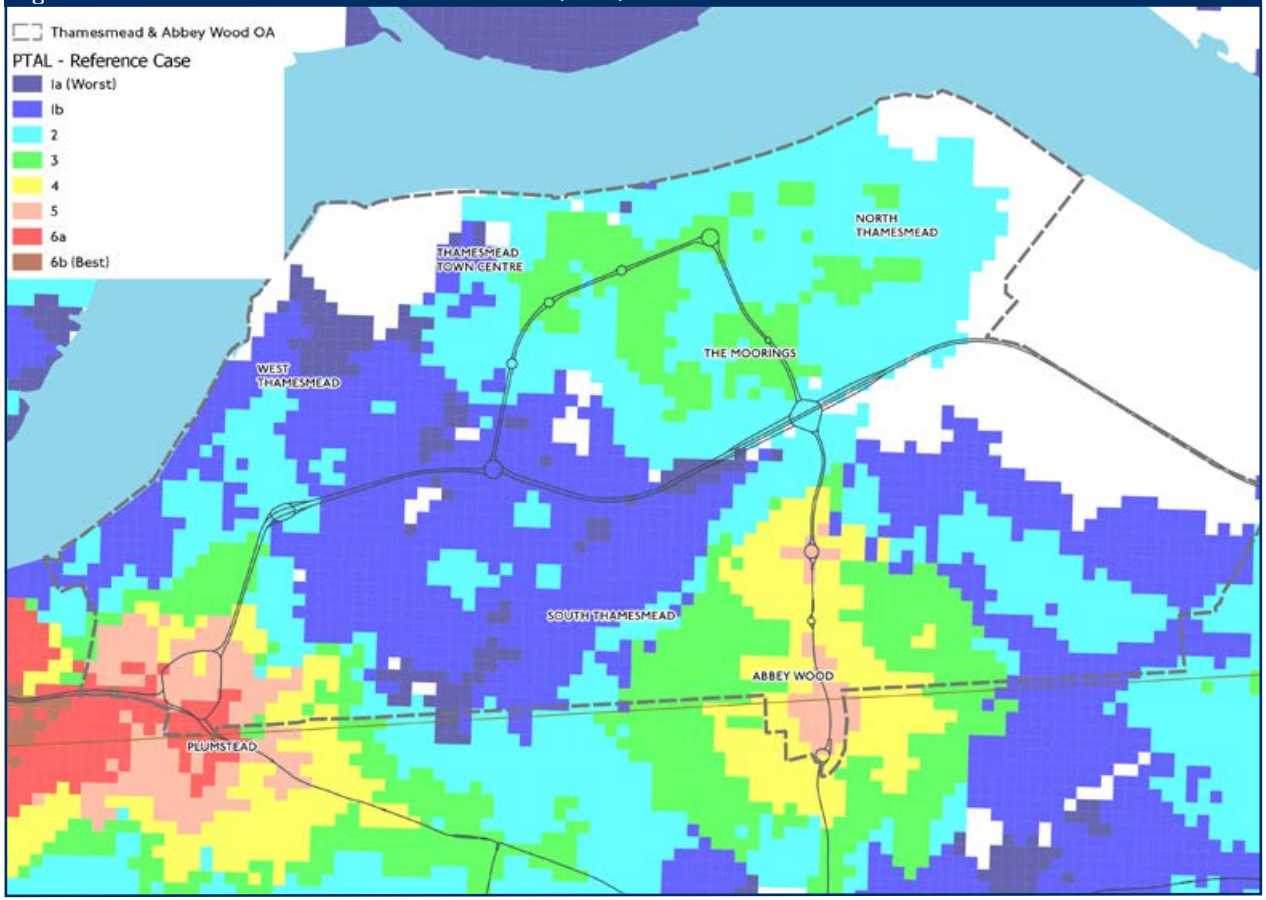
Some local bus services are likely to experience greater crowding post-2021, which could be addressed through the provision of increased capacity on these services. On the highway network, although the proportion of active and public transport modes increases, the assessment of the Reference Case scenario shows that total vehicle kilometres travelled within the OA will also continue to increase.

Reference Case PTAL

Figure 16 shows Public Transport Access Levels (PTALs) across the OA in 2041, with the introduction of Elizabeth line services. PTALs improve compared to the 2015 baseline scenario (see page 17), particularly in the areas surrounding Pettman Crescent, Plumstead and Abbey Wood.

The Elizabeth line has a more limited impact on PTALs in the north of the OA, however, as much of the OA lies beyond the walk catchment of Elizabeth line stations.

Figure 16. Reference case PTAL with Elizabeth line (2041)

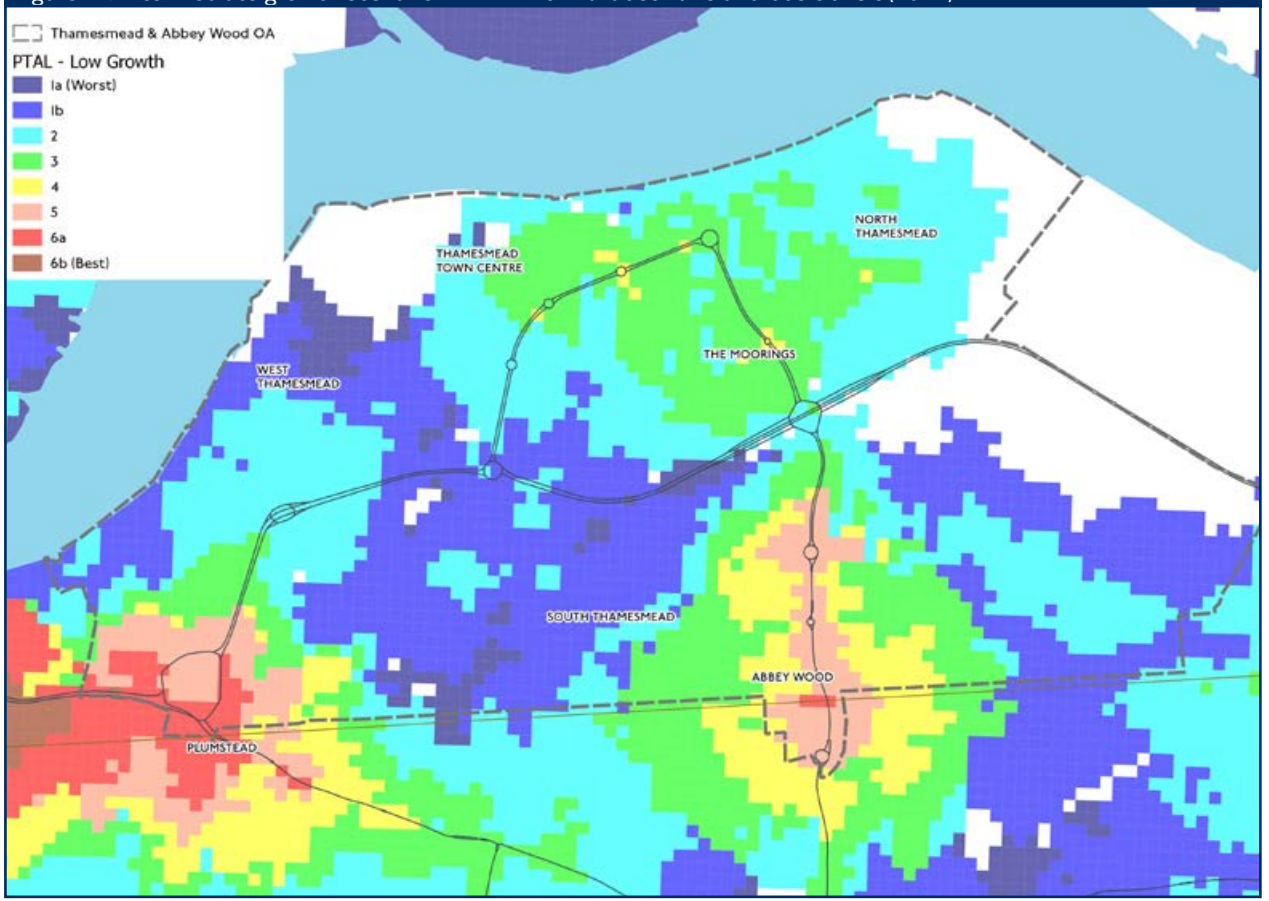


Intermediate growth scenario

The 2041 scenario with intermediate growth has been modelled with additional homes at sites across the OA, particularly around north Thamesmead, and investment in bus transit linking Woolwich, Thamesmead town centre and Abbey Wood.

Figure 17 shows PTAL levels within the OA with the introduction of bus transit. The new service would bring a greater proportion of Thamesmead up to PTAL 3 and parts of Thamesmead town centre to PTAL 4. This is an improvement compared to Reference Case PTALs, but still lower than PTALs around Abbey Wood. To the south of the OA, the introduction of bus transit increases PTAL to 5 in areas along Harrow Manorway towards Abbey Wood.

Figure 17. Intermediate growth scenario - PTAL with Elizabeth line and bus transit (2041)



The introduction of bus transit in T&AW is forecast to increase the share of trips made by active and public transport modes (walking, cycling and public transport) to 75% of all trips within the OA, up from 64%.

The bus transit corridor and onward connections via the Elizabeth line are expected to provide significant journey time improvements for people travelling by public transport from Thamesmead. Compared to today, journey times from Thamesmead Central to Woolwich would fall by 5 minutes (22% reduction) while journey times to Canary Wharf via the Elizabeth line, would fall by 22 minutes (37% reduction). Bus transit would offer improved journey times and journey time reliability for people in T&AW, providing a more attractive option than the conventional bus services.

Due to demand, crowding on bus transit services occurs in the intermediate growth scenario, particularly on the approach to Thamesmead town centre from Plumstead, and between Thamesmead and Abbey Wood.

On the highway network, a small increase in traffic volumes can be seen in the intermediate growth scenario compared to the Reference Case. The greatest increase in traffic occurs in the inter peak period (5% increase)[I].

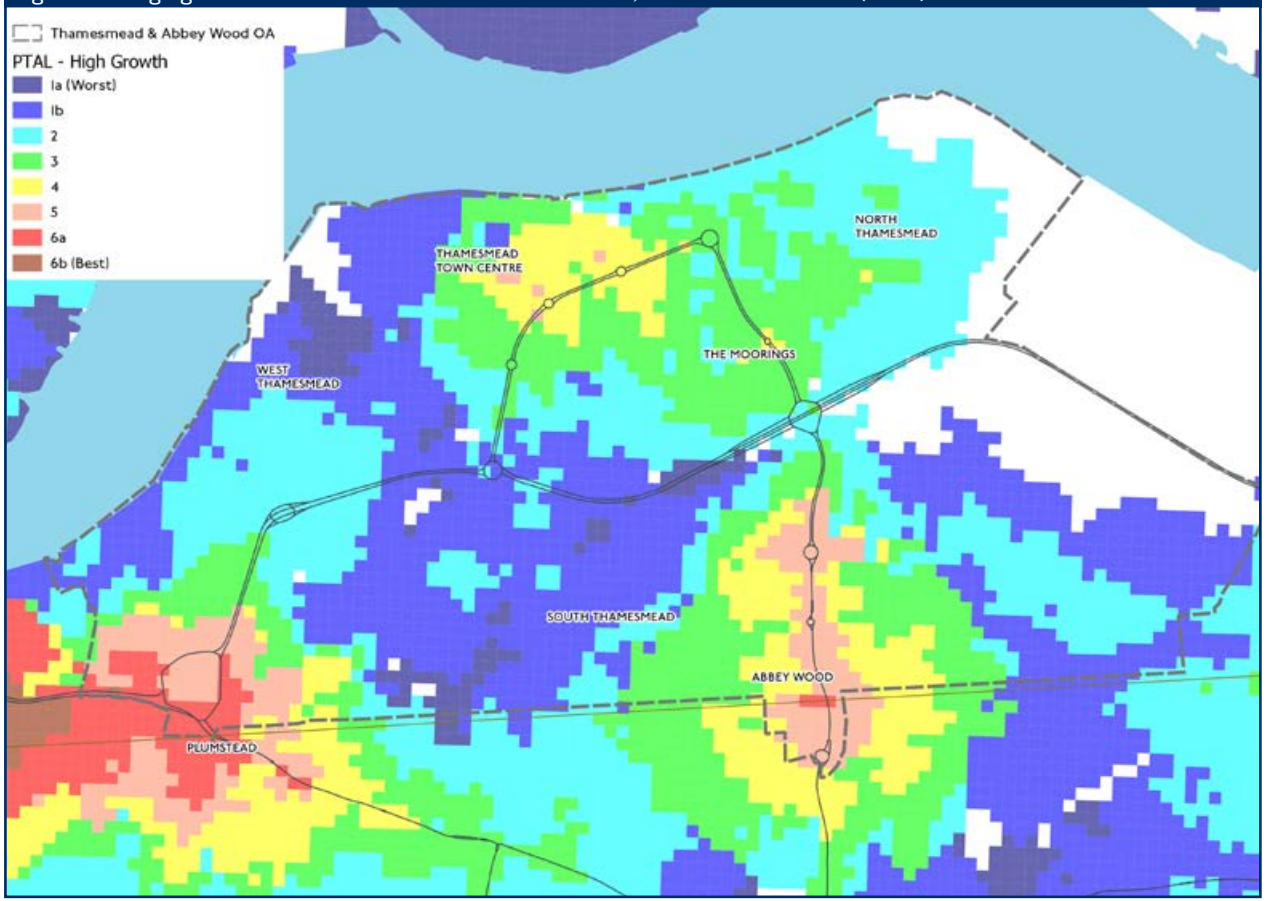
[I] Note that while strategic modelling provides an indication of the change in traffic flows, it is not designed for the assessment of individual roads and junctions. More detailed modelling would be required to test the performance of the highway network at a further stage of the bus transit scheme development.

High growth scenario

The 2041 scenario with high growth tests how well a higher level of development can be supported with the introduction of new strategic public transport connections along with a wider package of transport improvements. The full investment package of transport improvements would include a cross-river DLR connection, bus transit linking Woolwich, Thamesmead town centre and Abbey Wood, along with a reduction in highway capacity associated with bus transit, signficant improvements to walking and cycling infrastructure, improvements to local bus services and car parking restrictions.

Figure 18 shows PTAL scores across the OA for the high growth scenario. The DLR extension represents a step-change in transport connectivity in Thamesmead, with much of the area around Thamesmead Central increasing to PTAL 4 in this scenario. The DLR extension in conjunction with bus transit increases the reach of connectivity benefits in Thamesmead; much of the area is rated at least PTAL 3 in this scenario. With DLR and bus transit, the PTALs in Thamesmead are more comparable to those of Abbey Wood, but still well below PTALs in Woolwich.

Figure 18. High growth scenario - PTAL with Elizabeth line, DLR and bus transit (2041)



In the preferred high growth scenario (DLR extension to Thamesmead and bus transit corridor connecting Thamesmead with Woolwich and Abbey Wood), the share of trips made within the OA by active and sustainable modes increases to 79%. This is broadly in-line with the MTS target of 80%. It is important to note that other elements of the higher growth package of transport interventions, such as improvements to walking and cycling infrastructure and car parking restrictions, will have an important role to play to fully realise the 80% MTS target. For more information about the wider package of interventions, see Chapter 6.

In both the AM and PM peaks, the DLR serves a high level of demand between Thamesmead and Custom House, and Thamesmead and Canning Town, where passengers can access Elizabeth line and Jubilee line services. The availability of DLR and bus transit services, along with the Elizabeth line at Woolwich and Abbey Wood, results in significant journey time savings, compared to today, with journey time savings between Thamesmead Central and key centres of employment such as Stratford (20 minute / 31% reduction) and Bank (15 minute / 23% reduction) .

Additionally, the DLR would provide a quick and direct connection to the Royal Docks, which is set to see a significant increase in employment opportunities in the coming years.

In the high growth scenario, despite the provision of DLR, bus transit, bus service, walking and cycling improvements and restrictions on car parking and the associated reduction in car mode share in the OA, strategic modelling of the highway network indicates that total vehicle kilometres through T&AW will increase compared to the Reference case. The greatest increase in traffic occurs in the inter-peak period (13% increase).

In order to tackle London's housing shortage, TfL, the GLA and the boroughs support the delivery of a high growth scenario in T&AW OA. To overcome the challenges that this level of growth will bring, and ensure development in the area is brought forward in a sustainable way, TfL has developed a robust package of transport measures to support the vision of high growth up to 2041. This package supports a target of 80% of all trips in the OA being made by sustainable modes.

The preferred package of transport interventions, set out in Figure 19, aims to address the transport challenges identified in Chapter 3, taking into account the overarching themes of the Mayor's Transport Strategy and the results of Strategic Transport Modelling.

Overleaf - Figure 19. Preferred transport strategy for the Thamesmead & Abbey Wood OA.

Preferred transport and movement strategy for Thamesmead & Abbey Wood, to support the vision for growth within the OAPF up to 2041.

New homes and jobs

Forthcoming opening of **Elizabeth line**

Increased **bus capacity** to support the Elizabeth line & other potential new services

A **bus transit** system providing a step change in public transport accessibility and **supporting early growth**

Extension of Docklands Light Railway services into the OA to support up to **15,500** new homes and **8,000** new jobs and provide new **cross-river connectivity** in south-east London

Advocate for increased **train frequencies & extension** of the Elizabeth line

Future proof any rail extension to provide **orbital & radial links** beyond Thamesmead

A good public transport experience

Protecting **bus service reliability** and improving journey times

An improved **bus interchange** in Thamesmead town centre providing increased capacity & an enhanced passenger environment

Rebalance highway space to support active and sustainable modes

Investigate the role of **Demand Responsive Transport** to better serve North Thamesead

Advocate for the **devolution** of suburban rail services

Healthy streets, healthy people

80% sustainable travel to, from and within the Opportunity Area

Major capital investment in delivering **better streets for people** including a strategic healthy streets route alongside the bus transit corridor.

Delivering **active, safer & greener streets** that encourage more people to walk and cycle

Secure high quality active travel infrastructure and reduce car dependency through the **planning process**

Redesigning streets to encourage **reduced speed**

Overcome severance between North & South Thamesmead / Abbey Wood on foot and by bike

5 Infrastructure investment and implementation

An integrated approach to the delivery of new homes and transport connections is required to ensure the OAPF's vision is viable and deliverable. This means that in order for the new public transport connections to be progressed, new development is required; the public transport options would not be viable without this new development. Similarly, without new transport infrasture additional growth, beyond that identified in the draft new London Plan, will not come forward.

The purpose of this chapter is to outline how we will look to fund and deliver the infrastructure needed to support a higher level of growth within T&AW.

The delivery of this Strategy will be reliant on all relevant stakeholders working together. Collaboration between TfL, the GLA, the Royal Borough of Greenwich, the London Borough of Bexley and other stakeholders such as local landowners is required for the OAPF vision to come to fruition.

Delivering a transport system that meets the needs of the existing communities and future residents will require a substantial funding package. Without this in place, the significant growth potential of Thamesmead and Abbey Wood OA will not be realised, and existing communities will not benefit from improved public transport connectivity and the creation of Healthy Streets.

Funding of infrastructure

A detailed Development Infrastructure Funding Study (DIFS)[2] is recommended to identify costs for providing infrastructure and potential funding mechanisms for its delivery. This should comprise of a review of the Bexley Growth Strategy DIFS and a new commission for areas within Greenwich. This work should be conducted as a single, comprehensive study that covers the entirety of the OA to ensure delivery recommendations are coordinated as a number of key infrastructure project will require cross-boundary consideration and collaboration.

The indicative costs set out in Appendix B would be refined during the course of carrying out a DIFS. There are a number of sources of funding that could support the delivery of the infrastructure identified within this Strategy, as shown in Figure 20.

As has been the case for other major infrastructure projects (such as the Elizabeth line and the Northern Line Extension), any funding package for the new public transport connections is likely to include contributions from the new residential and commercial developments that the routes would serve.

Developer contributions would also be expected, where appropriate, to help fund more local transport improvements such as improvements to bus services, new or improved walking and cycling routes and public spaces.

[2]DIFS are used to identify future infrastructure requirements to support the proposed level of development across an area, and they provide recommendations for how to fund the delivery of this infrastructure.

Strategic measures: These include the DLR extension to Thamesmead and bus transit corridor linking Woolwich, Thamesmead and Abbey Wood. Strategic measures will be funded through sources such as developer contributions and the TfL Business Plan, which plays an important role in delivering transport infrastructure. Other funding sources will also be explored, such as central government's Housing Infrastructure Fund.

Local measures: These include new or improved walking and cycling routes and public realm improvements. At the more local level, achieving the vision for Healthy Streets across the area will require the boroughs, TfL, developers, statutory undertakers and other stakeholders to work together to harness available funding sources to ensure the much needed infrastructure is delivered. A DIFS would highlight whether further sources of funding will be required to deliver the OAPF up to 2041 (including third party, developer works and other sources).

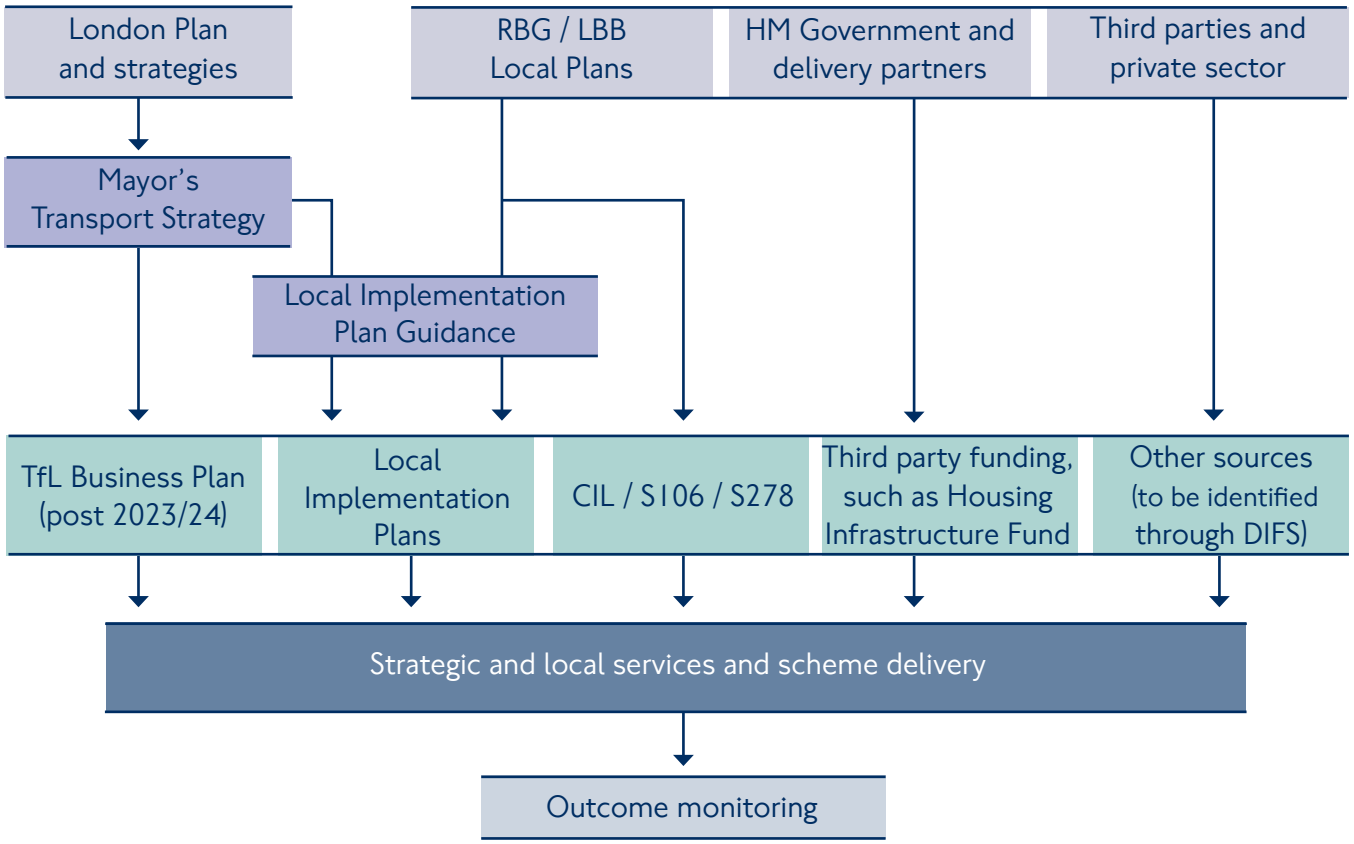


Figure 20. Transport strategy funding and delivery process

How will it be delivered?

The delivery of the OAPF will be managed by a Strategic Delivery Board comprising of partners including the GLA, TfL, and the local boroughs.

Given the delivery of new development is critical to ensuring the viability of the potential new public transport interventions, there is a direct link between these potential schemes and the development and implementation of the OAPF. A number of the other schemes identified in this Strategy are linked to London-wide initiatives such as the Healthy Streets Approach, and these will be progressed in parallel to the OAPF by the boroughs of Bexley and Greenwich, in partnership with TfL.

The Mayor's Transport Strategy commits to supporting good growth in the T&AW OA through the integrated delivery of improved public transport connections, alongside the creation of new homes and jobs. Building on the Mayor's Transport Strategy, this T&AW Transport Strategy identifies a bus transit corridor and DLR extension to Thamesmead as central to a package of transport measures to support the OAPF vision of delivering 15,500 new homes and 8,000 jobs across the OA.

In identifying the strategic public transport connections required to serve T&AW, TfL has undertaken an initial phase of option identification and multi-criteria assessment, focussing on a broad range of public transport options, including potential heavy / light rail extensions and bus based options.

The projects and programmes identified in this Strategy remain at an early stage of development, and significant technical work and stakeholder engagement is required before they could be progressed towards delivery. Figure 21 summarises the typical approach adopted in developing and implementing transport schemes, and highlights which parts of the Public Transport to Thamesmead programme TfL has completed at this stage, which parts are underway and which are yet to begin.

Next steps

The next stage of TfL's DLR scheme development will identify and assess potential alternative route alignments and station locations, taking into account the engineering feasibility, likely transport benefits - including new public transport connections - and environmental impacts.

For bus transit, the next stage of TfL's scheme development will examine its feasibility in further detail, taking account of the opportunities offered by the existing highway network and potential constraints along the route. The work will also identify the transport benefits of a transit scheme for existing and future residents of the OA, and consider the impact of the scheme on other road users along its route.

Further design development and engineering assessment will help identify the potential cost of the DLR and bus transit schemes in greater detail.

Public and stakeholder engagement

Feedback from the draft OAPF consultation will influence the future design development of the potential transport schemes, including consideration of the schemes' impacts. As these schemes continue to be developed, TfL will carry out further stakeholder and public consultation to help identify the preferred option to improve connectivity and support growth in the OA. Due to the regional scale of the strategic interventions proposed in this Strategy, engagement with neighbouring boroughs will be important.

Problem (outcome) Definition	Identification of transport challenges and the definition of objectives a transport intervention should seek to meet, taking into account existing challenges, the vision for T&AW and local / regional planning policy.	*Complete*	TfL, GLA, RB Greenwich, LB Bexley, Peabody and other landowners
Scheme Identification	Range of alternative solutions developed including different modes of transport, locations for implementation and dependencies.	*Complete*	
Scheme Assessment / Selection	Options considered against an assessment framework, which takes into account feasibility, cost, transport and social benefits, environmental impacts, to identify best performing option to take forward. Public and stakeholder consultation key at this stage.	*Underway*	TfL, GLA, RB Greenwich, LB Bexley, Peabody and other landowners, community forums, public and other stakeholders
Scheme Development (preferred option)	Further design and transport assessment, land and property assessment, and environmental appraisal undertaken for selected option. Further consultation informs option assessment to help identify a preferred option for delivery.	*Future workstream*	
Scheme Consents and Delivery	Depending on the scheme, planning or highways consents may be required to enable delivery, this could take the form of planning permission, highways consent. For major transport schemes such as new railways, procedures such as a Transport Works Act Order to the Secretary of State for Transport may be required, given the complexity of the project.	*Future workstream*	TfL, RB Greenwich and LB Bexley
Scheme Monitoring	Following delivery, scheme impacts are monitored and evaluated to ensure the identified outcomes are delivered.	*Future workstream*	

Figure 21. Transport scheme development process

Appendix A Transport challenges and opportunities

Introduction

The current and future transport challenges and opportunities in T&AW are set out in this Appendix, including:

- cross-river connectivity and access to employment;
- bus capacity and journey time reliability;
- uptake of walking and cycling;
- safety; and
- air quality.

An overview of these issues can be found in Chapter 3.

Cross-river connectivity & access to employment

Over the past two decades, there has been a step-change in rail provision in inner east London, with new rail lines, such as the Jubilee line, Docklands Light Railway (DLR) and London Overground creating significant transport hubs and centres of growth such as Canary Wharf and Stratford. However, no new cross-river rail connections have been provided east of Woolwich, and as a result orbital connectivity in outer east London remains very poor. Many potential journeys are not made due to the lack of realistic public transport options, or otherwise very long and circuitous journeys are made, often by car, through congested crossings at Blackwall and Dartford.

Figure A1. Change in access to employment from Thamesmead & Abbey Wood

Location	Number of jobs within 45 minutes (2015)	Number of jobs within 45 minutes with Elizabeth line (2031)
Abbey Wood	115,000	1,275,000
Thamesmead Moorings	100,000	855,000
Thamesmead Central	75,000	255,000
West Thamesmead	65,000	185,000

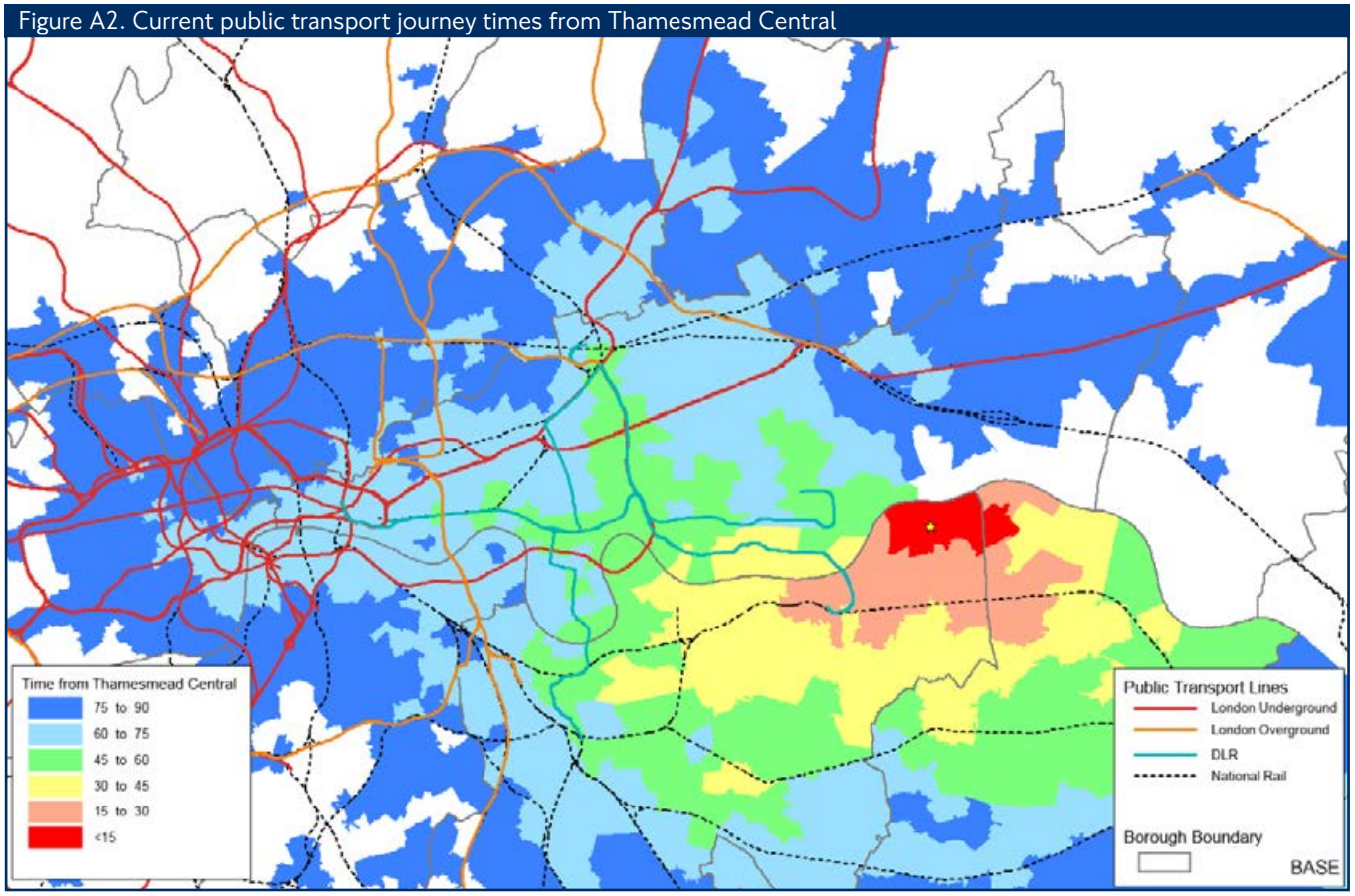
As a result of poor access to direct public transport services in the OA, access to employment, education and social opportunities is often limited. Improving access to nearby centres of employment, as well as ensuring good local connections to new jobs within the OA, could transform the opportunities available to people living around Thamesmead and help attract new people to this area.

Despite the forthcoming opening of the Elizabeth line, without new strategic connections access to employment and other opportunities elsewhere in London will remain relatively poor from the north of the OA, as shown in Figure 13.

Due to the reliance on bus-based public transport to access rail services, journey times from Thamesmead to central London and the Isle of Dogs are notably longer than from the southern parts of the OA that are better connected.

Figure A2 shows the journey times to access employment from Thamesmead Central. The majority of places outside the boroughs of Greenwich and Bexley take over 60 minutes to travel to.

Figure A2. Current public transport journey times from Thamesmead Central



Bus capacity and journey time reliability

The local bus network plays a crucial role in connecting the northern parts of the OA with nearby town centres, such as Woolwich and Bexleyheath, and provides the main connection to rail services that enable residents to access employment and social opportunities located in other parts of London.

The OA's urban form, including the highway network, layout of residential streets and physical severance such as the Ridgeway, restricts residents' access to bus services and limits the extent to which the bus network can offer a high quality connection with surrounding centres and transport hubs. Bus services are unable to penetrate some residential areas, primarily in Thamesmead East, due to the existence of cul-de-sacs and roads that are unsuitable for buses.

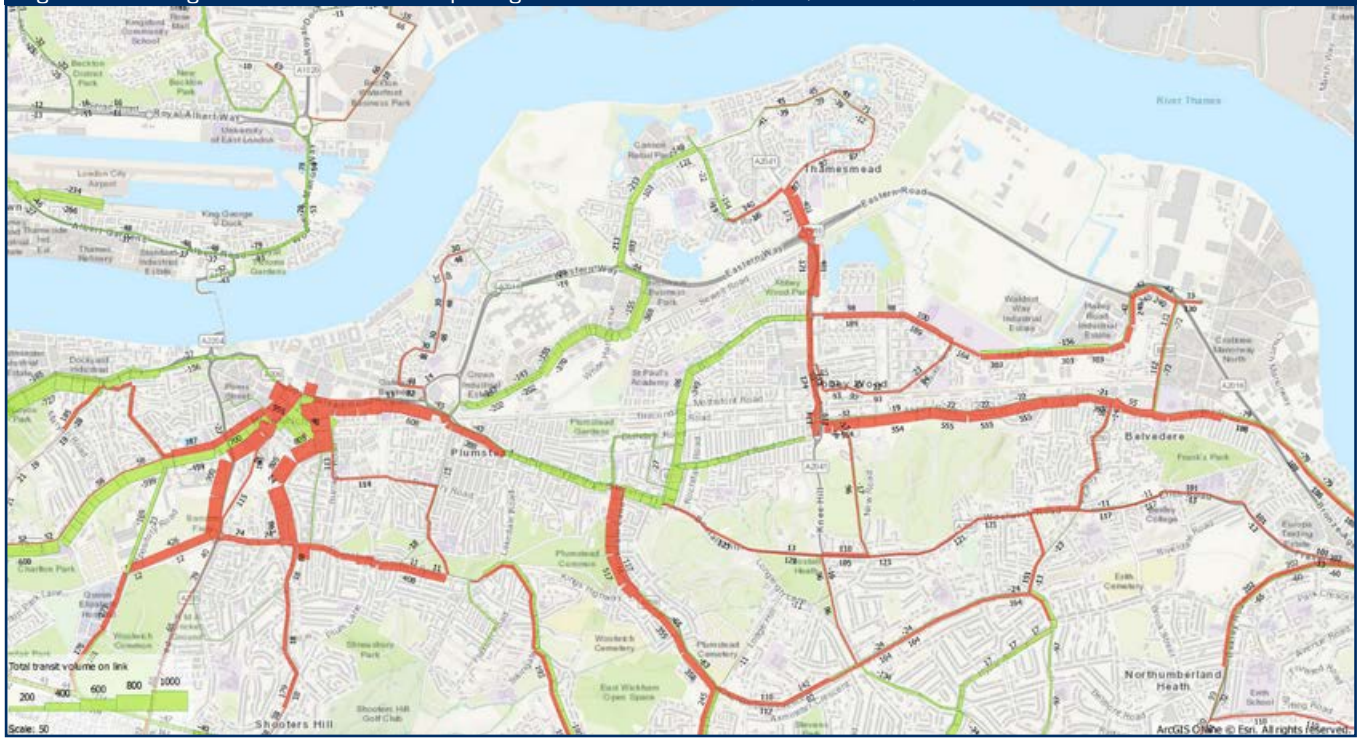
As a result, some residents experience long walks to/ from bus services and buses are required to follow circuitous routes in order to serve all parts of the OA. As such, journey times by bus are often long through the OA.

Further challenges include the variability of bus journey times through the Pettman Crescent Gyratory and Woolwich town centre, which impacts on headways (time between buses) at peak times and cause high levels of crowding on services. Poor reliability and slow speeds reduce passenger demand for bus services, which in turn reduces fare revenues within the OA. Congestion in areas including Plumstead Road, the Blackwall tunnel approach and Woolwich Ferry also impact on local bus routes serving the OA.

The opening of the Elizabeth line is expected to increase demand on the bus corridors into Abbey Wood and Woolwich as shown in Figure A3. To address this increased demand, TfL will be implementing changes to the local bus network to ensure bus capacity is sufficient to meet passenger demand when the Elizabeth line opens, up to 2021.

Post 2021, some local bus services are likely to experience increased crowding pressures which could be addressed through the provision of increased capacity on these services.

Figure A3. Change in bus demand with opening of the Elizabeth line (2021, AM Peak)



Local connectivity

Connectivity within the OA is fragmented due to physical barriers to travel including the road and rail infrastructure, features of the green and blue network such as the Ridgeway, and the urban form. Existing communities have developed in a way that means local services such as schools and healthcare centres tend not to be easily walkable or accessible by public transport.

Despite the number of off-road walkways that exist throughout the OA, wayfinding is poor and making use of these routes is not encouraged for people unfamiliar with the area. As a result, a high number of short distance trips that should be easily made on foot or cycle are predominantly being made using motorised modes of transport.

There is an opportunity in the area for streets to function as social spaces and places that actively encourage walking and cycling, as well as corridors for vehicular movement. In order to realise this potential, the following issues need to be addressed:

- Lack of legibility
- Lack of infrastructure, particularly on-street
- Severance
- Poor quality, hostile and unsafe street environments

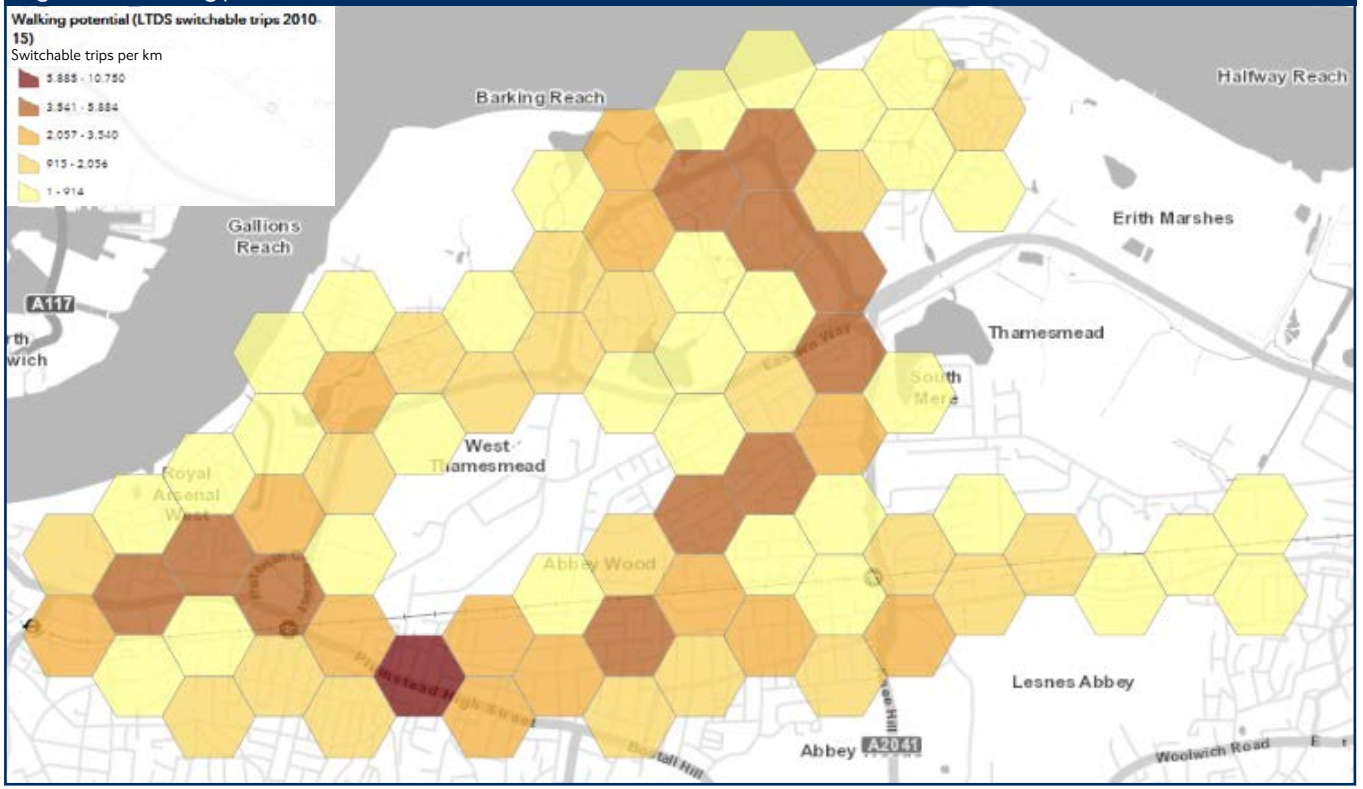
More information on improving local connections in T&AW can be found in the Part 5 - Places of the OAPF.

Walkability and walking potential

Walkability is a measure of the extent to which the public realm provides for movement and other activity on foot in ways that are both efficient and enjoyable. Across the Royal Borough of Greenwich as a whole, the Thamesmead area has been identified as one of the main areas of poor walkability.

Thamesmead Moorings, Thamesmead town centre, South Thamesmead and Plumstead have all been identified as areas where there is strong potential to switch the number of trips currently made by car or public transport to walking based on trip distance. A shift to walking could be realised through improvements to the pedestrian environment, in particular reductions in severance which is most pronounced around Western, Eastern and Central Way.

Figure A4. Walking potential

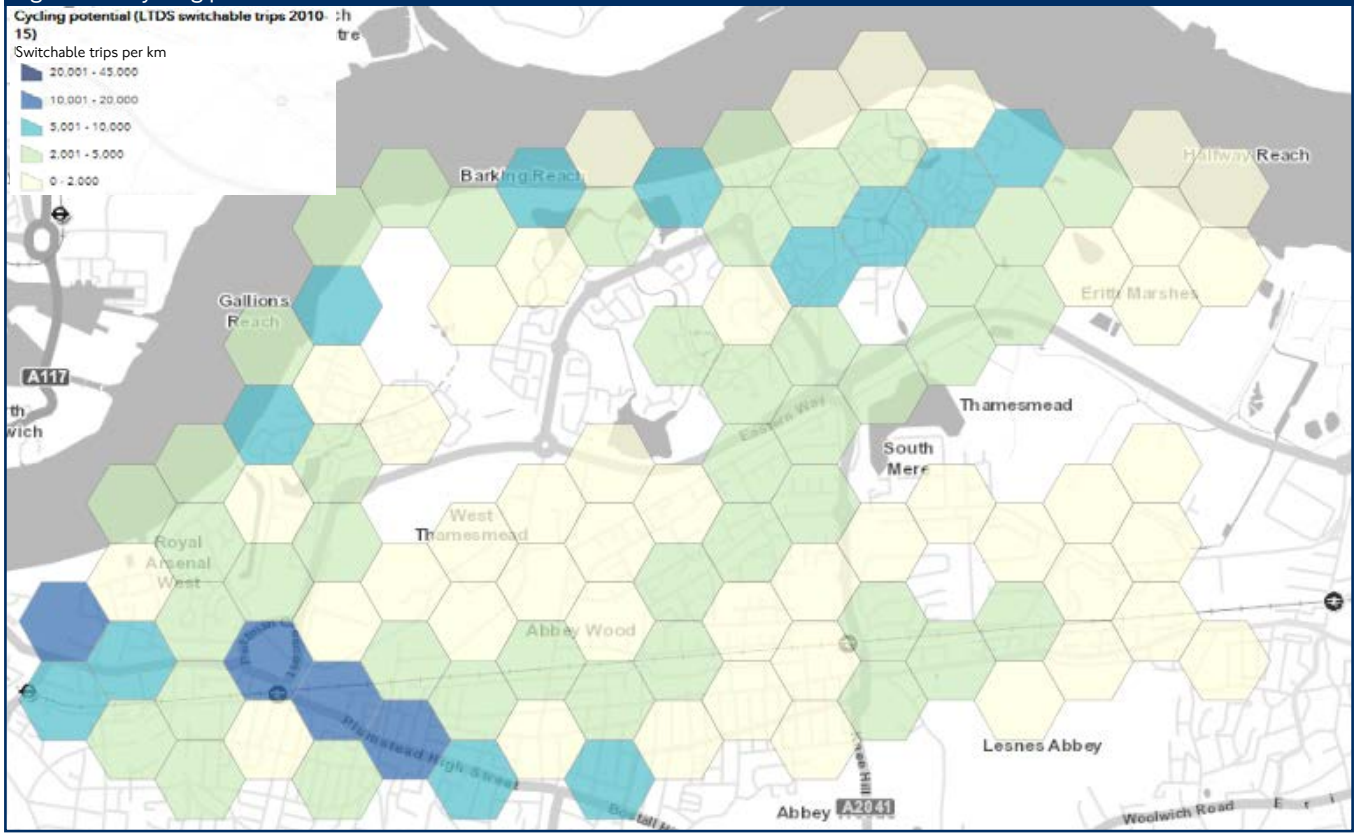


Cycling potential

LTDS data indicates that there is a high potential for uplift in cycling across the OA. A high density of cyclable trips could be made to / from Plumstead, Thamesmead East and Thamesmead town centre as shown in Figure A5. This includes trips that could be cycled in their entirety as well as part of multi-modal trips, e.g. accessing rail stations for onward journeys, which are currently being made by car and public transport. By improving the cycling environment and providing a coherent cycle network, there is the potential to reduce car travel and free up additional capacity on local bus services for those who are more reliant on these modes of transport.

TfL's Strategic Cycling Analysis identifies high potential cycling demand between Woolwich and Thamesmead town centres, and classifies this as a corridor that would benefit from cycle infrastructure to serve trips currently being made using motorised modes. Providing cycle infrastructure between Woolwich and Thamesmead would link the OA into London's strategic cycle network, with plans in development to build a new cycle route between London Bridge and Woolwich.

Figure A5. Cycling potential within the OA



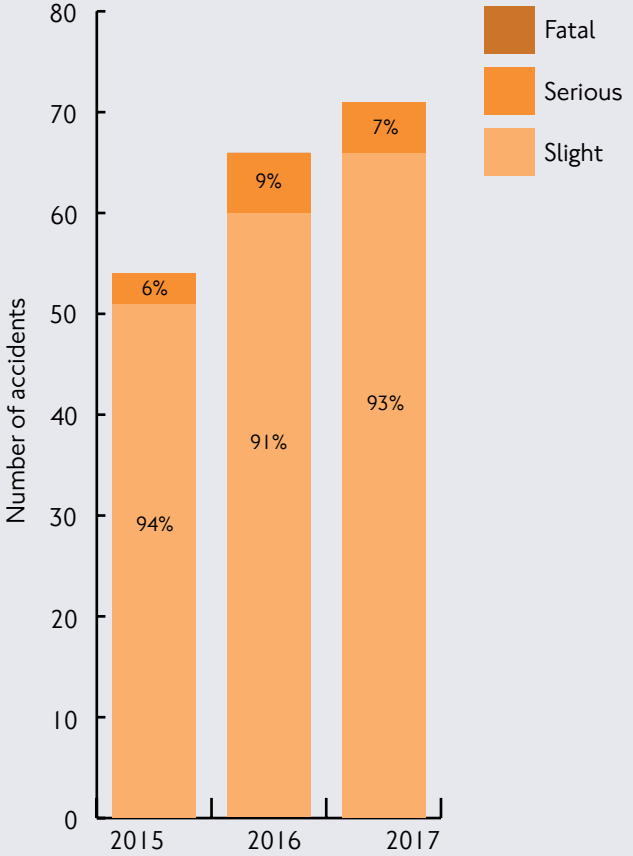
Safety

Safety and perceptions of safety are key barriers to uptake of walking and cycling. The number of collisions within the OA increased between 2014 and 2015 but fell again in 2017. During this period a total of 191 collisions were reported within the OA. None of these collisions were fatal, but 14 were serious and 177 were slight. Looking at longer term trends, the number of collisions involving pedestrians and cyclists within the OA has remained fairly constant between 2009 and 2017.

The majority of reported casualties (81%) on the highway network (all modes, 2014 - 2016) were centred in four key areas: Pettman Crescent, Thamesmead town centre, Harrow Manorway, and at the Eastern Way/ Central Way junction. Casualties in the Pettman Crescent area accounted for almost 40% of all accidents reported. Pettman Crescent is also identified in the poorest 20% performing areas in London for walking and cycling safety, based on the total number of collisions involving these modes.

To help support the Mayor's aim of having zero killed or seriously injured on London's roads by 2041, and to create a more attractive environment for walking and cycling to support a shift to active travel, improvements should be targeted in these four areas.

Figure A6. Collisions, 2015 - 2017



Air quality

The MTS highlights the scale of the air quality across London. Air pollution caused by carcinogenic diesel emissions, high levels of nitrogen dioxide (NO2) and particulate matter exacerbate health conditions and shorten the lives of Londoners. The OA will need to contribute to meeting London's legal air quality levels in the future, thereby protecting the health of Londoners and demonstrating a commitment to tackling climate change.

In addition to initiatives set out within the MTS, such as the Ultra Low Emission Zone (ULEZ), this Strategy proposes a significant package of walking, cycling and public transport measures to support a shift away from private car use and restrict the growth of total vehicle kilometres travelled. The remaining vehicles need to be as clean and energy efficient as possible to support further improvements in air quality, with the Mayor's aim for all road vehicles driven in London to be zero emission by 2040, and the entire transport system to be zero emission by 2050. Diesel is the most significant source of nitrogen oxides (NOx) emissions, which contribute to illegal levels of NO2, as highlighted in Figure A7.

Figure A7. Air quality - NO_2 ($\mu g/m^3$)

Appendix B Transport Implementation and Delivery Plan

This chapter sets out the package of strategic and local infrastructure to support Thamesmead & Abbey Wood, whilst addressing the challenges up to 2041.

The key transport infrastructure identified in this Strategy as necessary to support a high growth scenario in T&AW is illustrated in Chapter 4, Figure 16.

Given the scale of growth envisaged within T&AW, the delivery of new homes will need to be phased alongside the delivery of the interventions proposed in this Strategy, to ensure that new developments are planned and delivered in a way that encourages sustainable travel choices.

In support of the high growth OAPF development scenario, it is envisaged that in the short term, the potential bus transit route would improve connectivity and bring forward housing in advance of rail investment, whilst embedding the principles of good growth at new developments. In the longer term, a DLR extension to Thamesmead would provide the necessary step-change in public transport connectivity, accessibility and capacity to support high-density development of currently isolated parts of the OA.

This Appendix provides more detail about the individual projects proposed in the T&AW Transport Strategy to support good growth in the OA.

The delivery tables that follow describe the projects in detail, along with:

- the challenges that projects will address;
- a high level estimated project costs;
- the current funding status of projects;
- the priority of projects (based on their ability to unlock growth and encourage a shift to active and sustainable modes of transport); and
- estimated timeframes for delivery.

KEY	
Challenge	A. Development – Unlock development sites B. Public transport – Improve access to public transport C. Highways – Reduce congestion & improve resilience of the highway-based public transport network D. Local connectivity – Improve local connectivity & reduce severance E. Health – Improve health of residents & enable travel by active & sustainable modes
Outline cost	£ - Up to 5M ££ - Up to 20M £££ - Up to 150M £££+ - Greater than 150M
Funding	F – Funded FF – Assumed to be funded in the future or potential funding source identified PF – Partially funded UF - Unfunded
Priority	Priority refers to how critical the infrastructure element is for the OAPF as follows: 1: critical enabling 2: essential mitigation 3: high priority 4: desirable.
Phasing period	Phasing refers to when the infrastructure should come forward within the short term (ST: Up to 2025); medium term (MT: Up to 2030); and long term (LT: post 2030 and 2031).

i Strategic transport to unlock growth[1]

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
A1	**Elizabeth line**						
i	**Elizabeth line**	Introduction of the new Elizabeth line with 12 trains an hour.	Development, Public Transport	£££+	F	1	ST
ii	**Elizabeth line service patterns**	In addition to A1i, longer-term consideration is being given to capacity enhancements to the Elizabeth line.	Development, Public Transport	£££+	FF	2	LT
iii	**Elizabeth line complementary bus network changes**	A series of changes will be implemented to local bus services to accommodate additional demand generated by the opening of the Elizabeth line, to ensure sufficient bus network capacity to 2021.	Development, Public Transport, Health	£	F	2	ST
iv	**Abbey Wood cycle hub**	Cycle routes should be planned to ensure access to public transport hubs in the OA, with cycle parking provided at these locations to allow for onward travel. In the short term, a cycle hub will be introduced at Abbey Wood station, offering secure cycle parking for people making onward connections via Elizabeth line and National Rail.	Public Transport, Highways, Health	£	F	2	ST
A2	**DLR**						
i	**DLR extension**	DLR extension from Beckton to Thamesmead (incl. Thamesmead DLR Station). This could include a stop at Beckton Riverside.	Development, Public Transport	£££+	UF	1	MT
ii	**Further DLR extension**	Above ground DLR extension from Thamesmead into Bexley (Belvedere).	Development, Public Transport	£££+	UF	4	LT

[1]A London Overground extension does not form part of this Strategy for the reasons set out in Chapter 5, although it could come forward at a later stage as part of a larger scheme to tackle orbital connectivity in outer London.

i Strategic transport to unlock growth

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
A3	**Bus transit**						
i	**Bus transit - phase 1**	Amendments to the highway between Plumstead, Thamesmead and Abbey Wood to provide priority for Bus Transit services and a high quality stops/ stations.	Highways, Local Connectivity, Health	£££	UF	1	ST
ii	**Bus transit - active travel corridor improvements**	Provision of supporting pedestrian and cycle improvements in the form of crossings, paths/ tracks, cycle parking etc. to provide good local links to/from new bus transit stops/stations. High quality public realm should also be incorporate around transit stops.	Local Connectivity, Health	£	UF	1	ST
iii	**Completion of North Greenwich to Slade Green bus transit corridor - later phases**	Following the successful implementation of a pilot bus transit service, the system could be extended, with potential for bus transit to extend further into both Bexley and Greenwich.	Highways, Local Connectivity, Health	£££	UF	4	LT

ii Other public transport improvements

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
A4	**Bus service enhancements**						
i	**Short term bus enhancements**	A number of changes to the existing local bus network are planned following the start of Elizabeth line operations from Abbey Wood, to maximise its benefits.	Development, Public Transport, Health	£	UF	2	ST
ii	**Medium to long term bus enhancements**	Continued development of the bus network and services to support growth in the OA in the medium and long term (to 2041). This could include further increases in services, together with other capacity increases on routes, and potentially new routes to serve the area. Suitable bus priority will be needed to support continued route development and reliability. A strategy will be developed to identify the need of the bus network in the medium and long term, to ensure it supports and integrates with new public transport services in the area as these come forward.	Development, Public Transport, Health	££	UF	2	LT

ii Other public transport improvements

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
B1	**Metroisation of southeastern rail services**	Building on Policy 1 and Proposal 64 of the Mayor's Transport Strategy, TfL will continue to work with the DfT, Network Rail and Southeastern with the aim of bringing the frequency and reliability standards of rail services serving Abbey Wood in line with that of other TfL-run lines. While some network capacity constraints would remain on rail services through the OA, 'metroisation' or simplification of services could create a more attractive travel option and support mode shift away from the car.	Public Transport, Highways, Health	TBC	UF	3	MT
B2	**Improvements to Thamesmead town centre bus interchange**	An improved bus interchange in Thamesmead town centre is being considered to provide a significant improvement on the existing facilities, providing an enhanced passenger environment together with sufficient capacity to meet the transport needs of a growing and increasingly sustainable town. This could serve as a high quality gateway to Thamesmead town centre, as well as a key interchange for bus transit, buses and cycles.	Public Transport, Highways, Health	TBC	UF	3	ST

ii Other public transport improvements

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
B3	**Demand Responsive Transport (DRT)**	LB Bexley has identified North Thamesmead in its shortlist of areas within the borough that would benefit from a more flexible and innovative form of public transport. TfL will work with LBB to identify opportunities to introduce DRT services into this area. The role of Demand Responsive Transport in enabling further sustainable development will also be explored more broadly in the OA.	Public Transport, High-ways, Health	£	UF	3	ST
B4	**Riverbus pier**	A new river service for the OA would create new and more diverse journey opportunities for residents, and create a more enjoyable passenger experience and positive perception of new developments in the area. It is not envisaged that new Riverbus services in Thamesmead would result in strong modal shift due to the relatively high cost of fares, however the infrastructure required to introduce this service is modest and improving access to central London by river would improve the resilience of the public transport network serving the OA. TfL will work with Peabody to explore the potential for constructing a new pier at the Thamesmead Waterfront development and integrating this with London's River Bus services.	Public Transport, Local Connectivity, Health	£	UF	4	LT

iii Interventions to promote healthy streets and healthy people

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
C1	**Major projects to tackle severance**	This includes projects that are unlikely to be delivered directly through new development, such as: new bridge connections over Eastern Way and Ridgeway; a new bridge over the North Kent line at Waldrist Way; remodelling of junctions on Central Way, Crossway and Yarnton Way to improve conditions for walking and cycling; and potential reconfiguration of the elevated junction Eastern Way/Carlyle Road/Harrow Manorway junction.	Highways, Local Connectivity, Health	££	UF	4	MT
C2	**Local connections – street and public realm improvements**	This complements the healthy streets improvements that come with the transit works. It includes: improving other key routes for walking, cycling and public transport, such as Bentham Road and Eynsham Drive; high quality public realm at local centres, such as Thamesmead Central and The Moorings; and public realm improvements for key connectors such Crossway, Nathan Way and Alsike Road.	Public transport, Development, High-ways, Local Connectivity, Health	££	UF	3	ST
C3	**Local connections – joining up on-street walking and cycling networks**	This is about ensuring that strategic walking and cycling connections away from the transit route are enhanced, particularly 'Connecting to Crossrail' improvements to on-street walking and cycling networks that connect to Plumstead and Abbey Wood stations.	Highways, Local Connectivity, Health	£	UF	3	ST

iii Interventions to promote healthy streets and healthy people

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
C4	**Local connections – improvements to off-carriageway networks**	Enhancing the quality and accessibility of existing walking and cycling routes, such as Claridge Way and the link to Lesnes Abbey, ensuring that the network joins up key local destinations. Improving accessibility to existing strategic links, particularly access to the Ridgeway.	Local Connectivity, Health	£	UF	3	ST
C5	**Local connections – new green links**	Taking opportunities to deliver new walking and cycling links in the network that provide for utility and leisure trips, and create well-signed and attractive circuits, such as the Broadwater to Crossway and Crossway to Crossness links. This includes integrating local landmarks, such as Gallions Hill, Crossness and Lesnes Abbey, as well as parks and green spaces more effectively within the local walking and cycling networks. While some of this can be delivered through new development, it is likely to need further funding from other sources to complete gaps in the network.	Development, Local Connectivity, Health	£	PF / FF	3	MT

iii Interventions to promote healthy streets and healthy people

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
C6	**Measures to improve air quality**	Building on Policy T6 of the draft new London Plan and Policy 7 of the Mayor's Transport Strategy, where parking is provided at new residential developments, infrastructure for electric or Ultra-Low Emission vehicles must be provided. At least 20 per cent of spaces should have active charging facilities, with passive provision for all remaining spaces. The provision of car clubs at new developments and in existing residential areas will be promoted as a way to reduce car ownership and accelerate the cleaning of the vehicle fleet in the area. Vehicle charging facilities and car club bays should also be introduced at town centre locations and other key locations within the OA to facilitate a move to a cleaner vehicle fleet and lower levels of car ownership. A Freight Area Management Plan (see D1-D5) will be drawn up to identify opportunities to reduce the emissions associated with freight in the OA, particularly during the construction of new developments.	Highways, Health	TBC	FF	2	ST

iv Freight Area Management Plan

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
D1	**Develop freight evidence base**	As new developments come forward in the OA, it will be important to minimise the impact of construction traffic along the STDR and set up measures to ensure that delivery and servicing trips associated with new homes and jobs in the area are minimised. Building on Policies SI1 and T7 of the draft new London Plan, the OAPF Delivery Board will lead on the development of a sound freight evidence base to inform freight management decision making in the OA. The evidence base should be kept updated as an ongoing process that feeds into the decision making body (see D2). A piece of work could be commissioned to set up the evidence base and for process for keeping it updated. This will enable the creation of a robust Freight Area Management Plan for the OA to support growth and minimise the impact of development in the OA going forward, as well as provide quality of life for existing communities. It will look to inform the development of D2 and D3 below.	Highways, Health	£	UF	I	ST

iv Freight Area Management Plan

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
D2	**Strategic freight infrastructure**	The OAPF freight coordination forum will assess the need for strategic freight infrastructure and put forward evidence backed proposals for intervention. Intervention may include the delivery of a pier for delivery of construction materials	Highways, Health	TBC	UF	2	ST
D3	**Freight mitigation coordination**	An OAPF freight coordination forum is to be set up to consider the information provided by the evidence base, coordinate mitigation delivery (see D4) and assess the need for strategic infrastructure intervention, for example a consolidation centre. The Councils will lead on the drafting of a Freight Area Management Plan to pull this information together, with support from TfL. The forum will be made up of community groups, developers, the Councils, TfL and freight industry groups.	Highways, Health	£	UF	1	OAPF lifespan

iv Freight Area Management Plan

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
D4	**Strategic freight infrastructure**	The OAPF freight coordination forum will assess the Freight Area Management Plan and the need for strategic freight infrastructure, and put forward evidence backed proposals for intervention. Intervention may include the construction of a pier for delivering construction materials and removing waste at key development sites, and consolidation solutions to optimise day to day freight movements. As intervention proposals come forward, land should be safeguarded through the OAPF to support their delivery.	Highways, Health	TBC	UF	I	OAPF lifespan
D5	**Freight coordination / collaboration measures**	The OAPF freight coordination forum will provide a space for the OA freight stakeholders to collaborate, coordinate and consolidate their freight activity. For example, consolidation could be achieved by reviewing delivery vehicle routes and loads with a view to sharing vehicle capacity where the opportunity exists. The forum will also engage and inform the community on freight matters.	Highways, Health	TBC	UF	I	OAPF lifespan

v Planning policy, travel demand management and behavioural change

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
E1	**Planning for good growth**	The OAPF, including this Strategy, look to improve the health and quality of life of all Londoners, reduce inequalities and make the city a better place to live, work and visit. Transport plays a vital role in supporting and ensuring the Good Growth Policies laid out in the new London Plan are achieved.	Development, Public Transport, Highways, Local Connectivity, Health	N/A	N/A	I	OAPF lifespan
E2	**Strategic approach to transport planning**	Building on Policies T1 and GG2 of the draft new London Plan and Policy 1 of the Mayor's Transport Strategy, the T&AW OA should support and facilitate the delivery of at least 80 per cent of all trips to, from and within this area to be made by foot, by cycle or using public transport by 2041.	Development, Public Transport, Highways, Local Connectivity, Health	N/A	N/A	I	OAPF lifespan
E3	**Travel Demand Management Strategy for T&AW**	Detailed business-as-usual work to increase the scope and depth of behaviour change initiatives for the area, in concert with the infrastructure improvements.	Development, Public Transport, Highways, Local Connectivity, Health	N/A	N/A	I	OAPF lifespan

v Planning policy, travel demand management and behavioural change

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
E4	**Parking**						
E4i	**Cycle parking**	Building on Policy T5 of the draft new London Plan, Development Plans and proposals should help remove barriers to cycling and create a healthy environment in which people choose the cycle. This will be achieved through the delivery of a network of cycle routes through the OA, with new routes and improved infrastructure. In addition to this, we need to secure the provision of appropriate levels of cycling parking which should be fit for purpose, secure and well-located. Developments should provide cycle parking at least in accordance with the minimum standards set out within the draft new London Plan and designed and laid out in accordance with the guidance contained in the London Cycling Design Standards. Minimum levels of secure and accessible cycle parking should also be provided at town centres within the OA, a key public transport interchanges and other key destinations to facilitate a greater uptake of cycling.	Development, Public Transport, Highways, Local Connectivity, Health	N/A	N/A	I	OAPF lifespan

v Planning policy, travel demand management and behavioural change

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
E4ii	**Car parking**	Building on Policy T6 of the draft new London Plan, car parking should be restricted in line with levels of existing and future public transport accessibility and connectivity. The potential introduction of bus transit and DLR to poorly connected parts of the OA provides an excellent opportunity to deliver highly accessible and 'car-lite' developments. The provision of car clubs at new developments within the OA will be promoted to encourage car sharing as an alternative model to car ownership, paired with a reduction in the availability of private parking. New retail development should avoid being car-dependent and should follow a town centres first approach, as set out within Policy SD8 of the draft new London Plan. For more detail refer to Policy T6 of the draft new London Plan. Additional changes in parking policy within the OA could include introducing new or extending existing controlled parking zones; incentivising residents to give up parking spaces; and introducing charging schemes to manage private car use key locations such as at local centres and public transport hubs.	Development, Public Transport, Highways, Local Connectivity, Health	N/A	N/A	I	OAPF lifespan

v Planning policy, travel demand management and behavioural change

Ref.	Thamesmead & Abbey Wood Interventions	Details	Challenge	Outline cost	Funding	Priority	Phasing period
E5	**Funding transport infrastructure through planning**	Building on Policy T9 of the draft new London Plan, the Mayor will charge the Mayoral Community Infrastructure Levy (MCIL) to secure funding towards transport infrastructure of strategic importance. Planning obligations, including phasing of development, financial contributions, will be considered and sought to mitigate impacts from development, which may be cumulative.	Development, Public Transport, Highways, Local Connectivity, Health	N/A	N/A	I	OAPF lifespan

Dependencies

Many schemes reported here are part of wider programmes and will be progressed in parallel to this OAPF. These interventions, particularly the strategic interventions, will impact this OA. For example, possible capacity enhancements to the Elizabeth line.

Ref	Interventions	Details	Phasing period
1	**DLR Rolling Stock Replacement Programme (additional and replacement rail cars), more frequent services and associated infrastructure works)**	Procurement of new rolling stock to enable additional capacity to be provided on the network. This will achieve more on train capacity and enable high levels of services to be provided (working towards achieving 30tph network-wide). Trains would be delivered from 2022 onwards.	ST
2i	**DLR Beckton Depot stabling enhancements**	To accommodate and support the new proposed DLR Rolling Stock.	ST
2ii	**DLR Amplified Growth Programme**	Addition of 14 trains to the DLR RSRP and expansion of Beckton Depot to accommodate them	ST
3i	**Elizabeth line service patterns**	Longer-term consideration is being given to capacity enhancements to the Elizabeth Line (through looking at options for lengthening trains by 20% versus running more frequent services). Funding for this would come from the TfL Business Plan.	LT
3ii	**Elizabeth line extension (C2E)**	Elizabeth line extension between Abbey Wood and Ebbsfleet along the North Kent line.	MT
4	**Silvertown Tunnel**	New cross-river road tunnel at Silvertown. Construction is set to begin in 2019/20, with 2024 the earliest estimated opening date. Once open, tolls will be introduced to both Silvertown Tunnel and Blackwall Tunnel in order to ease congestion and improve the reliability of cross-river journeys.	ST

Dependencies

Ref	Interventions	Details	Phasing period
5	**Safeguarded land for Gallions Reach crossing**	Land in the north of T&AW OA is safeguarded for a previously proposed road crossing. However, a key objective of this Strategy is to promote a shift away from car use and to increase use of public transport and active travel in order to support the delivery of good growth within the OA. As such, the road crossing does not form part of this Strategy.	N/A
6	**Future Cycle Route 11**	A segregated cycle way from Greenwich town centre through to Woolwich via Charlton.	MT
7	**East and south east London public transport capacity**	TfL-led study to review the need for further strategic public transport capacity across east and south east London, including supporting Thamesmead and Abbey Wood.	LT

Appendix C Glossary

Accessibility
In the context of this Strategy, accessibility refers to how easy it is for people to use London's streets and public transport to get to places, jobs, homes and services, considering particularly the needs of older and disabled people.

Active travel
Trips undertaken by physical means, such as walking and cycling.

Bus transit
Bus transit is a form of public transport that can take many different forms, with a range of potential vehicles, passenger facilities and guidance systems. Differences between a conventional bus service and bus transit include speed, level of priority, reliability, and quality of stop infrastructure.

Buses per hour (bph)
Bph indicates bus service/schedules for a particular bus route/stop.

Business Plan
A five year plan which sets out how TfL will deliver the Mayor's ambitious plans for transport across London.

Capacity
The capacity of a transport system is the number of passengers, weight or volume of a load that can be carried by the system. For public transport systems, the capacity is a function of the frequency of services as well as the number of passengers that can be carried.

Community Infrastructure Levy (CIL)
A non-negotiable charge, which allows local authorities (including the Mayor) to help fund infrastructure needed to support the development of an area in line with local development plans.

Connectivity
The general term for how easy it is for people to get to places, jobs, homes and services.

Consolidation
The process of rearranging and combining deliveries to reduce the number of van and lorry journeys made in London.

Consolidation centre
A centre where deliveries can be brought for more efficient onward movement to their final destinations. It enables organisations and planning authorities to improve operational efficiency, resulting in reduced congestion, fewer delays and improved safety.

Cycling potential
An analytical TfL tool designed to understand the potential for growth in cycling as mode of travel.

Design Manual
One of the suite of OAPF documents. This presents the shared priorities for walking and cycling improvements, in order to deliver Healthy Streets.

Development capacity scenarios
Scenarios undertaken to look at potential for residential and employment growth in the OA in the future.

Development Infrastructure Funding Study (DIFS)
DIF studies identify future infrastructure requirements to support the proposed level of development across an area. DIF studies include a set of recommendations for how to fund delivery of this infrastructure.

Evening / PM peak
The period in the afternoon and evening when travel demand is highest (4pm-7pm).

Greater London Authority
The strategic regional authority for Greater London.

Healthy Streets Approach
The Mayor and TfL's approach to prioritising people and their health in decision-making to create a healthy, inclusive and safe city for all. The approach seeks to make London a more attractive place to walk, cycle and use public transport, and reduces the dominance of motorised transport.

Green and blue network
A network of parks and other green spaces, rivers, lakes and canals.

Growth Area
Specific areas for new residential development to accommodate future population growth, as outlined in the Government's Sustainable Communities Plan. Within London these include the Thames Gateway and the London-Stansted-Cambridge-Peterborough Corridor.

Inner London
The boroughs of Camden, City of London, Hackney, Hammersmith & Fulham, Haringey, Islington, Kensington & Chelsea, Lambeth, Lewisham, Newham, Southwark, Tower Hamlets, Wandsworth and the City of Westminster, as defined by the Office for National Statistics.

Liveable Neighbourhoods
The Liveable Neighbourhoods programme provides a new funding stream that will apply the Healthy Streets Approach on the ground to make our streets places where people choose to walk and cycle, not to drive.

Local Implementation Plan (LIP)
A statutory transport plan produced by London boroughs, which brings together transport proposals to implement the strategy at a local level.

Local Plan
This plan sets out local planning policies and identifies how land is used, determining what will be built where.

London Atmospheric Emissions Inventory (LAEI)
A database of emissions sources and information about rates of emissions for air pollutants within and around London.

London Borough of Bexley
The London Borough of Bexley is a London Borough in outer south east London. T&AW OA sits partially within this borough.

London Plan
The Mayor's spatial development strategy for London.

Londoners
Permanent and temporary residents of London and, where also applicable, commuters from outside London, visitors and tourists.

London Transportation Studies model (LTS)
LTS is a strategic multi-modal four stage aggregate model for London and its surrounding area. It is used to prepare forecasts of growth in total travel, change in travel patterns, the transport mode chosen and the routing of trips through the road and public transport networks.

London Travel Demand Survey (LTDS)
LTDS is an established annual household travel survey of London residents that has been running on a continuous basis since 2005/06. The survey seeks to understand and quantify, in a statistically-robust way, the travel behaviour of Londoners and the relationships of this to a range of socio-demographic, spatial and transport network factors.

Mayor's Transport Strategy
This document sets out the Mayor's policies and proposals to reshape transport in London over the next 25 years.

Mode share
The relative use of each mode of transport. The calculation of mode share in the strategy is based on trips.

Mode shift
A change in behaviour whereby a person changes the mode of transport they use either for a specific journey (e.g. their journey to work) or more generally.

Multi-modal trip
A trip that involves using more than one mode of transport, e.g. cycling to a train station then continuing the journey by train.

Morning / AM peak
The period in the morning when travel demand is highest (7am-10am).

Opportunity Areas
London's principal areas of opportunity for accommodating large-scale development to provide substantial numbers of new jobs and homes. Each typically has more than 5,000 jobs and/or 2,500 homes, with a mixed and intensive use of land, assisted by good public transport accessibility.

Opportunity Area Planning Framework (OAPF)
Strategic spatial plans for Opportunity Areas in London, as designated in the London Plan.

Particulate matter
A complex mixture of extremely small particles and liquid droplets that get into the air and can be inhaled.

Public realm
Publicly accessible space between and within buildings, including streets, squares, forecourts, parks and open spaces. Streets make up the greatest part of the public realm in most cities.

Public transport accessibility level (PTAL)
A measure of connectivity to the public transport network. For any given point in London, PTALs combine walk time to the network (stations, bus stops) with service wait time at these stops to give an overall accessibility index. There are six accessibility levels (1=poor, 6=excellent).

Section 106 (s106)
These agreements confer planning obligations on persons with an interest in land in order to achieve the implementation of relevant planning policies as authorised by Section 106 of the Town and Country Planning Act 1990.

Royal Borough of Greenwich
The Royal Borough of Greenwich is a London Borough in inner south east London. T&AW OA sits partially within this borough.

Section 278 (s278)
These are agreements are formed between the highway authority and the developer when developments require improvements or changes to the highway network. S278 of the Highways Act 1980 allows a developer to carry out works to the public highway.

Step-free network
The network of Underground, London Overground and/or national rail stations that provide step-free access from the street to the platform or train, such as through the provision of lifts or ramps.

Severance
Severance, or community / physical severance, occurs where ,features such as roads, railways, waterways and street networks act as a barrier to movement through an area, particularly on foot or by bicycle.

Trains per hour (tph)
Tph indicates train service/schedules for a particular railway route/station.

Transport for London (TfL)
One of the GLA group of organisations, accountable to the Mayor, with responsibility for delivering an integrated and sustainable transport strategy for London.

Transport model
A transport model is a mathematical representation of all or part of a transport system. It is used to evaluate existing conditions and to project future effects and needs.

Travel Demand Management
The application of strategies and policies to reduce travel demand, or to redistribute this demand in space or time.

Trip
A one-way movement from one place to another to achieve a single main purpose. Trips may be further sub-divided into journey stages.

Ultra Low Emission Zone (ULEZ)
Charging zone in which vehicles that do not comply with emissions standards for air pollutants will be subject to a daily charge.

Walking Potential
An analytical TfL tool designed to understand the potential for growth in walk travel

Walkability
Walkability is a measure of how easy and appealing an area is to walk in.

Appendix D Modelling assumptions

Development capacity assumptions

To test the residential and employment capacity for T&AW OA, two transport scenarios were agreed between TfL, GLA, the Royal Borough of Greenwich and the London Borough of Bexley to help identify the impact of growth.

The first scenario considered an intermediate growth scenario, assuming an additional 8,000 homes and 5,500 jobs across the OA compared to the 2015 baseline, along with background growth in the area, to be delivered by 2041.

The second scenario assessed a high growth scenario, assuming an additional 15,500 homes and 8,000 jobs across the OA compared to the 2015 baseline, along with background growth in the area, again to be delivered by 2041.

Potential growth scenarios tested

Scenarios with and without these levels of growth were developed for the strategic transport model, LTS. These were used to assess whether the transport networks could accommodate the development capacity growth scenario in the AM peak.

The size of LTS model zones does not match the size and shape of T&AW OA. All LTS zones that are partially within the OA have been included in the modelling study area, so the population and employment figures are greater than for the OA alone. There is a significant increase in the number of homes and jobs between the baseline and Reference Case scenarios, a reasonable proportion of this growth takes place in neighbouring OAs, such as Charlton Riverside, it is not all in T&AW.

2041 T&AW Reference Case

The first scenario that was developed for modelling was to represent 2041 with forecast growth included everywhere outside and within the OA itself.

A large proportion of the growth that makes up the future growth scenarios is growth associated with the Elizabeth line (5,000 homes and 4,000 jobs) and is included in the Reference Case, it has been added to the model again when testing future growth scenarios in order to 'stress test' the network.

In terms of new transport infrastructure, the 2041 Reference Case scenario includes committed schemes such as the Elizabeth line, the nearby Silvertown tunnel, and bus service improvements associated with these schemes.

2041 T&AW Intermediate Growth Scenario

This scenario starts with the 2041 T&AW Reference Case and adds in further populations and employment growth that could occur in the OA in an intermediate growth scenario. This represents:

- Prospective housing sites
- Jobs

This scenario adds population growth of 18 per cent and employment growth of 17 per cent above the T&AW Reference Case.

	Population	Homes	Difference from preceding (homes)	Housing scenario
2015 Baseline	85,000	34,000		LTS 2015 Reference Case
2041 T&AW Reference Case	111,000	49,000	+26,000* +44%	plus newly built + permitted homes by 2015
2041 T&AW with intermediate growth	132,000	58,000	+8,000 +18%	plus a further 'intermediate' level of growth

	Employment	Difference from preceding	Employment assumption
2015 Baseline	30,000		LTS 2015 Reference Case
2041 T&AW Reference Case	35,000	+ 5,000* + 17%	2015 employment level used for T&AW
2041 T&AW with intermediate growth	41,000	+ 5,500 + 17%	plus employment space unlocked by bus transit

All numbers above rounded to nearest 1,000.
Values shown are for the study area LTS zones, which comprise a greater area than the T&AW OA.
Average household size is specified depending on the borough. The assumed household size is 2.56 for new development in RB Greenwich and 3.04 in LB Bexley.
* As mentioned in the previous section some of this growth occurs outside the Opportunity Area

2041 T&AW High Growth Scenario

This scenario starts with the 2041 T&AW Reference Case and adds in further populations and employment growth that could occur in the OA in an intermediate growth scenario. This represents:

- Prospective housing sites including additional sites that could not come forward without a DLR extension to Thamesmead, and higher densities at sites that would be closely served by the DLR.
- Jobs

This scenario adds population growth of 29 per cent and employment growth of 22 per cent above the T&AW Reference Case.

	Population	Homes	Difference from preceding (homes)	Housing scenario
2015 Baseline	85,000	34,000		LTS 2015 Reference Case
2041 T&AW Reference Case	111,000*	49,000*	+26,000* +44%	plus newly built + permitted homes by 2015
2041 T&AW with high growth	155,000	66,000	+15,500 +34%	plus a further 'higher' level of growth

	Employment	Difference from preceding	Employment assumption
2015 Baseline	30,000		LTS 2015 Reference Case
2041 T&AW Reference Case	35,000*	+ 5,000* + 18%	2015 employment level used for T&AW
2031 T&AW with developments	43,000	+ 8,000 + 22%	plus employment space unlocked by bus transit & DLR

All numbers above rounded to nearest 1,000.
Values shown are for the study area LTS zones, which comprise a greater area than the T&AW OA.
Average household size is specified depending on the borough. The assumed household size is 2.56 for new development in RB Greenwich and 3.04 in LB Bexley.
* As mentioned in the previous section some of this growth occurs outside the Opportunity Area

Bus transit

A bus transit service was modelled at 12 buses per hour in each direction throughout the day, and was modelled to represent a 18m articulated bus. For modelling purposes the transit was added to the public transport network without amending the route or frequency of existing bus services.

Highway capacity

In order to give the bus transit quicker journey times and increased reliability it was assumed in the modelling that road space would need to be re-allocated from general traffic to the transit. For modelling purposes the transit is assumed to be fully segregated between Plumstead Station to Eastern Way via Thamesmead Central, and partially segregated from Woolwich to Plumstead Station, and from Eastern Way to Abbey Wood Station. Highway capacity is reduced by 50% on fully segregated sections and by 10% on partially segregated sections, while at junctions, capacity is reduced by 15% on fully segregated sections and by 5% on partially segregated sections. Further work will be required to progress the design of the transit and calculate the actual reductions in highway and junction capacities to facilitate the scheme.

DLR extension

The DLR extension modelled connects to the Beckton branch of the DLR and provides additional stations at Armada Riverside and Thamesmead Central. The extension is modelled as operating at 15 trains per hour throughout the day.

Car ownership levels

A general value of 0.1 cars per head was used for new development across the OA, however, in areas with higher PTAL values a lower cars per head figure was used ranging from 0.03 to 0.04 depending upon the exact location.